Chapter 4
Environmental Consequences

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INTRODUCTION

This chapter presents the analysis of impacts that would result from implementing any of the alternatives considered in this plan/environmental impact statement. The terms "impact" and "effect" are used interchangeably throughout this document.

The impact topics presented in this chapter and the organization of the topics correspond to the resource discussions contained in "Chapter 3: Affected Environment." This chapter includes information on the general methodology and assumptions for analyzing impacts, the analysis methods used for determining cumulative impacts, and definitions of impact thresholds (minor, moderate, and major) for each impact topic. As required by the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA), a summary of the environmental consequences for each alternative is provided in table 3 which can be found in "Chapter 2: Alternatives."

GENERAL METHODOLOGY AND ASSUMPTIONS FOR ANALYZING IMPACTS

The planning team based the impact analysis and the conclusions in this chapter on the review of existing literature and studies, information provided by experts in the National Park Service, park staff insights, public scoping, and professional judgment. The analysis includes an assessment of both direct and indirect impacts. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later in time or farther removed from the place, but are still reasonably foreseeable. It is important to remember that all the impacts have been assessed assuming that mitigative measures described in chapter 2 have been implemented to minimize or avoid impacts.

Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision Making*, presents the approach used to identifying the duration (short or long term), geographic context, type (adverse or beneficial), and intensity or magnitude (e.g., minor, moderate, or major) of the impacts. Assumptions used when considering impacts are explained further in this section.

In some sections of this chapter, there are references to modeling results. A traffic simulation model was developed to test bus schedules to meet indicators and standards. The model was also used to compare seasonal bus numbers and seat availability between and among the no-action and action alternatives. Appendix D presents a summary of the results of this traffic modeling.

Duration

As described in chapter 2, aspects of the transportation system would be monitored during the visitation season relative to the indicators and standards identified in the plan. Should monitoring show that a standard is exceeded, further changes to the transportation system would be made. Therefore, impacts could occur during the initial implementation of the plan or several years after, and would be identified by monitoring. The following definitions were used for duration of an impact:

Short-term Impacts

Short-term impacts are effects that last for up to two consecutive visitation seasons (or years). Because of the potential for adaptively managing the transportation system, short-term impacts could occur at multiple points during the life of the plan.

Long-term Impacts

Long-term Impacts are effects that last for more than two consecutive visitation seasons (or years).

NOTE: In the analysis of socioeconomic impacts, a slightly different definition is used: short-term impacts are considered to last up to five years, and long-term impacts last more than five years. This timeframe better captures general timeframes of socioeconomic conditions in response to changes in management actions.

Geographic Context

Because the alternatives in this plan and environmental impact statement relate to the management of vehicles along the Park Road, the area of analysis for direct and indirect effects is generally limited to those resources within or near the road corridor. As a result, the following terms were generally used when describing the geographic context of the effects for all impact topics except socioeconomics:

Local Impacts

For most impact topics, effects would occur along the Park Road corridor or in the immediate vicinity of the corridor. In the analysis of socioeconomics, local effects would occur in the area within Denali Borough in the vicinity of the northern portion of the park, including the communities of Healy, McKinley Village, and Nenana Canyon.

Regionwide or Parkwide Impacts

These effects would occur beyond the vicinity of the Park Road corridor and would extend to areas throughout or beyond the park. In the analysis of socioeconomics, effects would occur over a broader geographic region, extending to other communities of the Denali Borough such as Cantwell, Ferry, and Anderson. Effects could extend beyond the Denali Borough to other areas of central and southern Alaska, including Fairbanks and Anchorage.

Type of Impact

The following definitions of an adverse and beneficial impact were used in the analysis:

Adverse

Adverse effects are those effects which reduce the quality of, degrade, or diminish the visitor experience, transportation system, park resources (e.g., wildlife, wilderness), park management and operations, or the social and economic environment.

Beneficial

Beneficial effects are those effects which improve or enhance the visitor experience, transportation system, park resources (e.g., wildlife, wilderness), park management and operations, or the social and economic environment.

Intensity

Determining impact thresholds is a key component in applying NPS *Management Policies 2006* and Director's Order 12. These thresholds provide the reader with an idea of the intensity of a given impact on a specific topic. Because the intensity of impacts varies by resource, definitions of these are provided separately with each impact topic analyzed in this document.

CUMULATIVE IMPACTS ANALYSIS METHOD

The Council on Environmental Quality (CEQ) regulations for the implementation of the National Environmental Policy Act require the assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts need to be analyzed in terms of the

specific resource, ecosystem, and human community being affected and should focus on effects that are truly meaningful. Cumulative impacts are considered for all alternatives, including alternative A.

Cumulative impacts were determined by combining the impacts of the alternative being considered with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects and plans at Denali National Park and Preserve, and, if applicable, the surrounding area. Table 17 summarizes these actions that could affect the various resources at the park that might also be affected by vehicle management.

Table 17. Cumulative Impacts Scenario

Type of Action	Project	Description of Action	Status
Development	Development Concept Plan/Environmental Assessment for the Park Road Corridor (1983)	This plan described alternatives for upgrades of visitor and management facilities in the entrance area and along the Park Road corridor. A long list of projects was approved, including a visitor orientation center at the present Wilderness Access Center site. A decision was made to renovate the existing park hotel (a collection of railroad cars and modular units assembled on site after the September 1972 fire that destroyed most of the original building). **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	Past
	Addendum to the 1983 Development Concept Plan/Environmental Assessment for the Park Road Corridor (1987)	This addendum proposed a new park hotel near the existing site within an "activity center" concept. Many structures and functions, such as visitor center, general store, post office, activity expediters, and sled dog demonstrations were to be given space surrounding the hotel. All tour and shuttle bus operations would be consolidated in the existing tour bus barn area behind the hotel. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	Past
	General Management Plan (1986 and subsequent amendments)	This plan provides comprehensive guidance for all aspects of park management. It creates park zones, identifies resource management needs, summarizes interpretive objectives and the desired visitor experience, identifies incompatible uses on inholdings, and determines the need and general locations for park development. Major concepts in the plan confirm the use of a limited access transportation system for the Park Road, set a goal to reduce private vehicular traffic, establish a maximum limit on vehicles, enact a "no formal trails" policy for the wilderness units, and create an objective to allow as many people as possible to view wildlife in the park. The plan generally adopted the development proposals of the preferred alternative in the 1983 development concept plan, although it did remove some roadside trails and campground expansion from the previous plan. The general management plan remained consistent with the previous plan in not advocating any overnight	Ongoing

Type of Action	Project	Description of Action	Status
Development (continued)		accommodations in the Wonder Lake area other than the campground. The plan concluded that major new commercial development or subdivision of land that would promote major land use changes would be an "incompatible use." Evaluation of alternatives for the park hotel was reserved for a public process in 1987. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	
	Entrance Area and Road Corridor Development Concept Plan, 1997	This general management plan amendment addressed Park Road management, visitor services and facilities, and administrative facilities in the park entrance area and along the road corridor to Kantishna. It specified allocations for the Park Road vehicle traffic; set out Park Road maintenance strategies including the preservation of road character; and planned for new visitor facilities including an east-end interpretive center, a replacement of Eielson Visitor Center, a new environmental education center, the closure of the park hotel, and a new food service and gift shop facility. It also planned for administrative facilities including employee housing, a new EMS/fire station building, consolidation of maintenance facilities in the auto shop area, and a new administrative building in the headquarters area. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	Ongoing
	South Denali Implementation Plan (2006)	This plan provides specific direction for expanded visitor facilities and recreational opportunities in the South Denali region until 2021. Proposed actions are guided by established laws and policies that affect the National Park Service, State of Alaska, and Matanuska-Susitna Borough. Management actions prescribed by the plan should provide a quality visitor experience while protecting resource values in Denali National Park; enhance recreational and access opportunities throughout the South Denali region for the benefit of a wide variety of visitors; and preserve the quality of life for residents in nearby communities. **Affected Resources:** visitor use and experience, wildlife and wildlife habitat, park management and operations, socioeconomics	Future

Type of Action	Project	Description of Action	Status
Development (continued)	Education Plan	The overall purpose of the Denali Education Plan is to communicate the park's long-term vision, key interpretive themes, educational priorities and strategies that will help guide the park's education program over the next several years. The plan also provides direction on the park efforts related to community outreach, training, evaluation, and the critical role of relationship-building with park partners **Affected Resources:** visitor use and experience, park management and operations	Ongoing
	Business Plan (2004)	This Denali Business Plan was created to communicate the financial status of the park to its stakeholders—a group principally comprised of the public, Congress, National Park Service employees, local communities, Native corporations, and park partners. The plan also provides park management staff with financial and operational baseline knowledge that will inform future decisions. The plan has three general components: a synopsis of the park's funding history, a detailed picture of the state of current park operations and funding, and an outline of park priorities and funding strategies. **Affected Resources:** visitor use and experience, transportation system and traffic, socioeconomics, park management and operations	Ongoing
Changes to Transportation System	Not applicable	In 1990, the park announced location changes for facilities proposed in the 1983 Development Concept Plan and 1987 addendum. The shuttle bus operations and maintenance facilities were proposed for relocation to the sewage treatment lagoons area. The post office, general store and other camper conveniences were to be located near a new hostel close to a new loop in the Riley Creek campground. Shuttle drivers were to be provided housing at the residential area near park headquarters. Other campground changes were also proposed but not adopted. Provisions of the general management plan instituted through this process included removing private vehicle access to Sanctuary Campground and removing private vehicles from Teklanika River Campground, except for those who stay a minimum of three-nights. The Savage River check station was to move from the Savage Campground to the Savage River. The newsletter process also originated the idea of a lottery to select the private vehicles allowed past Savage River during the September opening of the Park Road. The concessioner was authorized to begin a new tour, the Denali Natural History Tour, to Mile 17.5 on the Park Road.	Past/Ongoing

Type of Action	Project	Description of Action	Status
Changes to Transportation System (continued)		**Affected Resources:** visitor use and experience, transportation system and traffic, socioeconomics	
	Contract Amendment #3 to Aramark Concession Contract (charging to ride transit)	**Affected Resources:** visitor use and experience, transportation system and traffic, socioeconomics	Past/Ongoing
	Vehicle Use on the Park Road Regulations (2000)	The Code of Federal Regulations includes a special section for national parks in Alaska (36 CFR Section 13 Subpart C). 36 CFR Section 13 provides details for regulation of vehicle traffic on Denali Park Road. The purpose of the Vehicle Use on the Park Road Regulations is to provide further delineation of management of vehicle use and transportation on the Park Road. **Affected Resources:** visitor use and experience, transportation system and traffic	Past/Ongoing
	Road Design Standards (2007)	The purpose of the Road Design Standards is to quantify the definition of "road character" for the Denali Park Road and bring together in one document the crucial factors that affect the Park Road. The overall management goal is to preserve the unique character of the Denali Park Road and the visitor experience it provides. Effectively, the standards guide repair of the Denali Park Road to work toward achieving the desired service condition for the numbers and size of design vehicle it is presently required to carry. The standards also provide quantitative guidance to the Federal Highways Administration in designing and engineering repair projects for the Park Road that do not change its unique character. This document identifies which maintenance and repair activities need subsequent management approval and additional National Environmental Policy Act compliance. **Affected Resources:** visitor use and experience, transportation system and traffic, park management and operations	Past/Ongoing

Type of Action	Project	Description of Action	Status
Road Rehabilitation	Road Rehabilitation in Igloo Canyon (2006 EA)	**Affected Resources:** Visitor Use and Experience, Transportation System and Traffic, Wildlife and Wildlife Habitat, Wilderness, Park Management and Operations, Socioeconomics	Past
	Rehabilitation between Mile 4 and 4.5 (2007 EA)	This plan guided necessary road rehabilitation work that would provide safe public travelways that can be maintained safely, efficiently, and in a cost-effective manner. The road rehabilitation was needed because of deteriorating road conditions between Mileposts 4 and 4.5, which posed a safety hazard to park staff and visitors (due to substantial aufeis[1] buildup along the road during severe winters). **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	Past/Ongoing
	Intervisible Pullouts and Other Improvements Between MP 73 and MP 86 (2009 EA)	This project addressed unsafe road conditions along a stretch of the Denali Park Road which had a disproportionately low amount of past safety improvements and a disproportionately high percentage of vehicle accidents (relative to other Park Road stretches). **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	Ongoing
	Regular Park Road Maintenance	Routine maintenance includes replenishment of road surfacing materials, brush cutting and shoulder maintenance, rockfall and mudslide removal, culvert clearing and replacement, trash pick-up, fuel delivery, and restroom maintenance. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	Ongoing

1 Aufeis is layered sheets of ice that build up from successive flows of ground water during freezing temperatures.

Type of Action	Project	Description of Action	Status
Facilities/ Construction/ Maintenance	Proposed Construction of Visitor Transportation System Facilities (1994 EA)	A decision was made to contract the operation of the shuttle bus system to the concessioner and allow them to set a fee schedule so the system would pay for itself. Pursuant to a June 1994 amendment to the 1981 concession contract, an environmental assessment was prepared to evaluate the placement of facilities needed to house the shuttle maintenance and operations in the park. The proposal included a 4-acre parking lot, doubling the size of the bus maintenance facility, a 24-room employee dormitory, a new employee dining facility, a new leach field for shoulder season operations, moving the recreation courts, and expanding the road network. By terms of the contract amendment, this work was completed by September 1996. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, park management and operations, socioeconomics.	Past
	Construction of New Visitor Facilities in the Entrance Area of Denali National Park (2001 EA)	This environmental assessment implemented portions of the 1997 Entrance Area and Road Corridor Design Concept Plan. Most significantly, it called for placing the major new visitor facilities (including the Denali Visitor Center, Murie Science and Learning Center, food service area, and bookstore/gift shop) at the location of the park hotel rather than at the visitor access center. It also provided for re-routing the Park Road, trail upgrades and reroutes, and the closure of Morino Campground. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, park management and operations, socioeconomics	Past (except Murie Science and Learning Center housing, which has not been completed)
	New Depot and Expanded Parking (1999 EA)	**Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, park management and operations, socioeconomics	Past
	Mountain Vista Rest Stop	This project involved the construction of a rest stop near the Savage Campground to provide for increased visitor use, experience, and facility needs in the park's entrance area along the road corridor (frontcountry). The project was identified and approved in the park's 1997 *Entrance Area and Road Corridor Development Concept Plan and Environmental Impact Statement*. This frontcountry rest stop includes auto, RV, and bus parking; a bus stop; interpretive exhibits; a covered deck; and vault toilets. The rest stop offers possible future trailheads for the Savage Alpine Trail and a short interpretive loop trail. The facilities at the new rest stop enhance visitors' experiences	Past

Type of Action	Project	Description of Action	Status
Facilities/ Construction/ Maintenance (continued)		in the park by providing opportunities to experience nature and gain a greater understanding of the park's values. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	
	Construction of Eielson Visitor Center and Permanent Toklat Rest Stop (2004 EA)	This project involved the replacement of the Eielson Visitor Center at Mile 65 of the Denali Park Road, as authorized by the 1997 Entrance Area and Road Corridor Development Concept Plan. The new visitor center was constructed on the same site as the previous visitor center, and was sized to appropriately serve the functions necessary at the site while also blending in with the surrounding landscape as much as possible. The new Eielson Visitor Center enhances the use of the Eielson site for on-site park resource interpretation and as a base for off-site interpretation, as a bus passenger rest stop, and as a bus turnaround and transfer station. The project plans also included the construction of improved facilities near the Toklat Rest Stop at Mile 54 to accommodate visitor use during the construction of the new Eielson Visitor Center. According to the plan, the Toklat Rest Stop would be made a permanent facility when additional funding becomes available. Bank stabilization work along the Toklat River was also included to protect the visitor and administrative facilities downstream of the west Toklat River bridge. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	Past (Eielson Visitor Center) and Future (Toklat)
	Replacement of Chemical Toilets (2009 EA)	This project involved the removal of restroom facilities at Polychrome Overlook, as well as the replacement and/or expansion of restroom facilities at Teklanika Rest Stop, Teklanika River Campground, and Toklat Rest Stop. The project includes the removal of existing chemical toilets and replacing them with non-chemical toilet facilities. These facility improvements are needed to reduce the severe shock loading the chemical laden wastewater puts on the Riley Creek Wastewater Treatment Facility, to reduce the wastewater pumping and hauling requirements, to improving the operational efficiency of park management.	Past

Type of Action	Project	Description of Action	Status
Facilities/ Construction/ Maintenance (continued)		**Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	
	New Trails in Savage Area (2009 EA)	This project involved the construction of the Savage Alpine Trail, the Savage Camp Interpretive Trail, and other short trails that improve the connections between the Savage River, Savage Campground, Savage Cabin, and the Mountain Vista Rest Stop along the section of the Denali Park Road from Mile 12 to Mile 15. The Savage Alpine Trail was identified in the 1997 *Entrance Area and Road Corridor Development Concept Plan/Environmental Impact Statement* as a new trail to provide increased recreational opportunities. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	Ongoing
	Road Rehab in Porcupine Forest Section of Road (2010 EA)	This proposed road rehabilitation project in the Porcupine Forest section of the Denali Park Road (MP 50.8 - 52.4) aims to improve and add intervisible pullouts, add a gravel surface wear layer, replace culverts, and address drainage and subgrade issues. The project is necessary because this section of road does not meet park standards for intervisible pullouts and has long been identified as having drainage problems and poor subgrade. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	Future
	Hotel Construction in Nenana Canyon	**Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, park management and operations, socioeconomics	Ongoing
Other	Purchase of Mining Inholdings in Kantishna (1990 EIS)	The Record of Decision for this plan and environmental impact statement sought to purchase existing mining claims in Kantishna. Since 1990, more than 90% of the patented mining claims have been acquired and more than 98% of the unpatented mining claim acreage has been acquired or has been abandoned. There is one block of unpatented mining claims (Liberty claims on Eldorado Creek) where mining could	Ongoing

Type of Action	Project	Description of Action	Status
Other (continued)		still occur. **Affected Resources:** visitor use and experience, wildlife, wildlife habitat, park management and operations	
	Gravel Acquisition Plan	This plan provided for five gravel extraction sites at Teklanika Pit, East Fork, Toklat River, Mile 70 Beaver Ponds, and Downtown Kantishna to serve needs for the next 10 years. Additional sites were identified to be evaluated for future use, including Old Teklanika Pit, Forest View, Boundary, Kantishna Airstrip, Friday Creek, Moose Creek Terrace, North Face Corner, and Camp Ridge. **Affected Resources:** visitor use and experience, transportation system and traffic, wildlife and wildlife habitat, wilderness, park management and operations, socioeconomics	Ongoing
	Section 351 of Consolidated Natural Resources Act of 2008	This federal legislation allows for a commercial authorization to a historical operator in Kantishna to offer daily guided hiking west of Toklat. **Affected Resources:** visitor use and experience, transportation system and traffic, park management and operations	Ongoing

VISITOR ACCESS, USE, AND EXPERIENCE

METHODOLOGY AND ASSUMPTIONS

This impact analysis is intended to illuminate the effects of the alternatives on visitor access, use, and experience. Characteristics of visitor access, use and experience, such as access to wilderness and other park resources, visitors' experience with transportation options and interpretation provided, as well as the cost of access and visitor safety, may be impacted by the alternatives' actions. The actions that may impact a visitor's experience include variations in the types of tours and transit services offered, the extent of pre-booking seats planned, and variations in management zoning.

Impacts on visitor access, use and experience were determined considering the best available information, including visitor surveys, the park's annual reporting data, input gathered from the public during the planning process, and information from park staff.

Measure

The analysis is primarily qualitative rather than quantitative due to the relatively broad level of planning involved, as well as the conceptual nature of the impact topic. Visitor experiences are multidimensional and involve a variety of characteristics or components. This impact analysis considers various qualitative characteristics of visitor use and experience in Denali National Park and Preserve, including ability of visitors to access wilderness recreation opportunities and other park features via the Park Road; diversity of visitor opportunities; visitor's interpretive experience; visitor safety and comfort; and visitor's opportunity for an affordable park experience.

Intensity Definitions

The following definitions of impact intensity were used for the visitor use and experience analysis:

Minor: Impacts to visitor access, use, or experience would be slight but detectable, and would not appreciably diminish or enhance the above characteristics of the visitor experience. Visitor satisfaction would remain stable.

Moderate: Impacts on visitor access, use, and experience would change the above characteristics and/or the number of visitors engaging in an activity would be altered. Visitors would be aware of the effects associated with implementation of the alternative and would likely be able to express an opinion about the changes. Visitor satisfaction would begin to either decline or increase as a direct result of the effect.

Major: The above visitor access, use, and experience characteristics would change noticeably, and/or the number of visitors engaging in an activity would be greatly reduced or increased. The visitor would be aware of the effects associated with implementation of the alternative and would likely express a strong opinion about the change. Visitor satisfaction would markedly decline or increase.

ALTERNATIVE A

Alternative A assumes that current conditions, including management strategies and visitor services, would continue. Although management adjustments to the system are continual and ongoing, those changes are assumed to be relatively minor in scope. Representing the existing condition, alternative A would continue to

manage vehicle use on the restricted section of the Park Road to maintain the 10,512-vehicle seasonal limit, as well as the various daily limits that were set by the 1986 general management plan and formalized in regulations in 2000. While resource monitoring and visitor survey work would continue to be conducted to address areas of concern, a formal adaptive management approach using indicators and standards would not be adopted.

Visitor Access

Accessing Wilderness

Currently, visitors use the transit system on the Park Road to access park wilderness areas. Under alternative A, the Visitor Transit System (transit) would not change; overnight visitors, including those with backcountry camping permits as well as those staying in a campground[1], would continue to use the camper shuttle part of the transit service to travel to and from these wilderness areas. Visitors getting into the wilderness by the Park Road would still be limited to shuttle buses for their transportation, as tour buses do not pick up eastbound hikers, and overnight visitors may have too much gear to be able to ride a crowded regular eastbound transit bus.

Overnight visitors must reserve their space on a camper bus in advance when they obtain their backcountry permit. There are typically five camper buses circulating per day; Joint Venture has six vehicles converted for use as camper buses. Camper buses fall under the transit allocation, which is limited to a total of 36 per day.

Under alternative A, transit buses are a day hiker's only option for returning from a hike in the wilderness, as tour buses do not pick up eastbound hikers. Eastbound seats on transit buses are currently a limited commodity because many transit riders do not leave their seat on a transit bus, either because they do not know they can get off and catch another bus, or because they are worried about catching the next bus.[2] Scoping comments indicate that shuttle bus riders would like more assurance of being able to get back on a bus if they choose to get off (NPS 2008). Day hikers are told to expect to encounter wait times of up to an hour to return from backcountry areas.

Therefore, alternative A would offer day hikers and campers limited return transportation options.

Accessing Park Features

The Denali Park Road serves as a way for visitors to access various park features, such as visitor centers, rest areas, day use areas, and frontcountry trails. The road also facilitates access to the park's natural and cultural resources. Alternative A would continue to provide access to these park features, such as the Eielson Visitor Center, the Teklanika and Toklat rest areas, six different campgrounds, and various trails, primarily concentrated around the park entrance. The Eielson Visitor Center is currently accessed by the majority of transit riders, by Kantishna Experience visitors, and by inholder lodge bus riders.

All of the concessioner buses except the Tundra Wilderness Tour either start at or make a stop at the Wilderness Access Center. Therefore, visitors often mistake this facility for the Denali Visitor Center even though there is no NPS presence (the facility is run by the concessioner). Some visitors do not realize that the Denali Visitor Center exists in the frontcountry, and this facility is underutilized. According to park staff, approximately 50% of visitors enter the Denali Visitor Center, compared to the park goal of 90% of visitors visiting the center (NPS 2009h).

[1] Except for those Teklanika River campers who go in by private vehicle

[2] A 2010 visitor use survey asked visitor why they did not get off the bus today to hike. 23% answered inclement weather, 21% said other members of their party weren't interested, and 16% said they were worried about catching another bus.

Rest areas accessed from the Park Road have a high degree of visitor satisfaction, including the condition of the facilities themselves, as well as the level of crowding at those facilities. Visitors have also indicated that the level of crowding at rest stops is a factor in their level of satisfaction.

Of the six campgrounds along the Park Road, only one on the restricted portion of the road west of the Savage River check station, Teklanika River, can currently be accessed by private vehicle. If visitors wish to RV camp at Teklanika River Campground, they can drive in, but must reserve a minimum three night stay; this is to minimize road traffic. Trails along the Park Road are concentrated around the park entrance and do not require the transportation system for access. Of those trails farther out along the road, some are located at Eielson, and one is at Wonder Lake.

There would be no change made to park feature access in alternative A; this would mean little opportunity to improve access to Denali's visitor centers or minimize crowding at wildlife stops. Alternative A would continue the current practice of monitoring the level of rest area crowding, which is done with visitor surveys but is not a part of any formal adaptive management approach. Vehicle traffic would continue to be permitted to Teklanika River Campground and would continue to be limited by the three-night minimum reservation requirement.

Cost of Access

There are currently several components involved in the cost of Denali Park Road access. Entrance fees, costs of tour or transit tickets, and other costs such as food and beverages, impact the affordability of the visitor's park experience. Ticket prices during 2010, for example, range from $24 for an individual adult transit ticket to $155 for an individual adult Kantishna Experience ticket, which includes lunch, snack, beverages, and hotel pickup. This current ticket structure therefore provides a broad range of cost options for the Denali Park Road visitor. What the current situation does not provide, however, is a low-cost tour option. The lowest priced tour ticket for 2010 was the Denali Natural History Tour, at $60.75 for an adult ticket. The Denali Natural History Tour takes the visitor as far as Primrose Ridge, not far past the Savage River check station. In contrast, a visitor could have paid $46 in 2010 and been able to travel out the length of the Park Road on a transit bus, albeit without the assistance of interpretive services. The visitor looking for an affordable tour opportunity that takes them farther out on the road than they could reach on their own by car does not have many opportunities to do so under the current situation. For that reason, visitors often use transit buses as a substitute for a low-cost tour.

Because of limited hiker and camper return transportation options, the lack of an economy tour offering, and the limited opportunity to improve access to Denali's visitor centers, Alternative A would have a minor adverse impact on visitor access.

Visitor Use and Experience

Transportation Use and Experiences

Under alternative A, visitors can choose between exploring the park via the transit system or by one of three different premium tours. This alternative will continue to offer a transit system where visitors are free to get off and re-board at any point, which is designed to accommodate independent travelers. Many riders on this current system, however, use the transit buses as a low-cost tour, where they retain their seat for the duration of the trip. The current condition does not offer a self-guiding economy tour. Other opportunities for visitors to explore the park are provided by the concessioner-run premium tours. Under alternative A, visitors would be able to choose between the Denali Natural History Tour; the Tundra Wilderness Tour, which goes to Mile 62 on the road; or the Kantishna Experience, which is currently

offered by one bus per day. Most visitors interested in a tour can be accommodated, but there are days and times when the demand for tours has exceeded the supply available.

Under the no-action alternative, visitors would continue to have limited choices for experiencing the park at the lower end of the cost spectrum. Without a separate economy tour offering, visitors looking for a tour experience at a lower cost would continue to take the transit buses, but may not get on and off the bus. This would interfere with other visitors' ability to leave the transit bus and explore off-bus opportunities, as they may be concerned about finding a seat when they want to re-board.

Alternative A may not fully meet the plan's objective of providing freedom of movement for recreational access to park resources.

Park Interpretive Experiences

Under alternative A, visitors have both on-bus and off-bus interpretive experiences while traveling on the Park Road. The overall interpretive experience, however, is significantly dominated by on-bus interpretation, as the majority of the visitor's experience in the park is on a vehicle. On-bus interpretation is provided by the current Denali concessioner, Doyon/ARAMARK Joint Venture (Joint Venture). Joint Venture has held the concession contract for transportation services at Denali since 2003, and some Joint Venture drivers have over 20 years of experience as drivers and guides in the park. Visitors on tour buses receive a full interpretive experience, conducted by certified driver-naturalists. The interpretation on the premium tour buses currently varies somewhat by tour: the Denali Natural History Tour is focused on Denali's natural and cultural history, the Tundra Wilderness Tour provides an in-depth history of the park while pointing out wildlife facts, and the Kantishna Experience provides park history as well as an in-depth look into Kantishna mining history. On the transit shuttles, on-bus interpretation is intentionally limited in nature. While drivers of transit shuttles wear headsets, they do not provide full narration, but will answer visitors' questions.

Off-bus interpretation in the no-action alternative would continue to focus on tour-related experiences, such as the living history interpretive programming at Savage Cabin and Alaska Native cultural interpretation at the Primrose Overlook that are a part of the Denali Natural History Tour. Other off-bus interpretive experiences under alternative A would include programming conducted by NPS staff. This would include interaction with rangers at visitor center facilities: visitors have opportunities to interact with NPS rangers at both the Denali Visitor Center and the Eielson Visitor Center.

As on-bus interpretation is provided by a commercial operator rather than NPS staff, ensuring the delivery of desired park messages can be challenging. One of the objectives of this plan is to ensure the transportation system provides the means for visitors to spend time at a visitor center. The Denali Visitor Center would likely continue to receive 50% of all park visitors under the current condition (Denali Education Plan, 2009). Although this facility is intended to be the primary provider of visitor information services in the entrance area, visitors confuse its role with that of the Wilderness Access Center. The Wilderness Access Center provides limited interpretive services. With no changes being made to the system to clarify the roles of these two frontcountry visitor interpretive buildings, this interpretation challenge would continue.

Alternative A provides access to off-bus, ranger-provided interpretive opportunities and opportunities for NPS ranger interaction on buses.

Visitor Safety and Comfort

Visitor safety and comfort on the Park Road are largely influenced by the safety of road

travel as well as the comfort of the buses themselves. The safety of the visitor while traveling the road is currently ensured by implementation of the park's "Rules of the Road" safety procedures, which cover issues such as rights-of-way and vehicle yielding procedures. These policies currently provide for the safe meeting and passing of vehicles on the Park Road, which is a safety priority, given the winding, narrow nature of much of this historic road. Addressing visitor safety issues (such as improving site distance, providing for adequate passing width, and improving surface road friction) was a top priority of the general management plan (NPS 2009).

Components of visitor comfort in the current condition include elements such as dust generation, improperly functioning windows, and uncomfortable seating. These issues have been mentioned by visitors in surveys (Manning and Hallo 2009). Although a majority of visitors have reported that they are satisfied with their "overall experience on the Denali Park Road,"[1] when asked what things they enjoyed the least, "uncomfortable seats on the bus" was the second most common reason for their dissatisfaction.[2]

Alternative A would continue to provide for the safety of visitors on buses by continuing the Rules of the Road system of vehicle safety procedures. It would also continue to use the current buses, which most visitors find to be acceptable. Alternative A would also continue the current dust control system, which largely satisfies most visitors' concerns about dusty bus rides.

Even though alternative A may not fully meet the plan's objective of providing freedom of movement for recreational access to park resources, it does provide a safe and comfortable park road experience and provides access to quality interpretive experiences from certified drivers and rangers. For these reasons, Alternative A would have a minor beneficial impact on visitor use and experience.

Cumulative Effects

Several past, present, or reasonably foreseeable actions may affect visitor use and experience within the project area. Past actions such as the construction of the Eielson Visitor Center had beneficial impact on visitor access to park features. The construction of permanent rest area facilities at Toklat could have a beneficial impact on access to park features for visitors that go out to Toklat. Implementation of the proposed (2009) new trail construction at Savage would beneficially impact visitors' experience on the Park Road by providing more places for visitors taking the transit system to get off the bus and explore the park. As a result of these actions, there have been long-term, moderate, beneficial impacts on visitor use and experience. In addition to these long-term benefits, the ongoing implementation of the gravel acquisition plan and other related road repair projects may have a long-term, minor, adverse impact on visitor experience if the associated construction traffic occurs during peak hours.

When combined with the impacts of alternative A, the cumulative impacts on visitor access, use and experience would be long-term, moderate, and beneficial. The impacts of alternative A would result in a substantial contribution to cumulative effects realized by the past, present, and reasonably foreseeable future actions.

Conclusion

Under alternative A, no changes would be made to the park's transportation system. Continued implementation of this system would affect the various components of the visitor experience differently. Alternative A

[1] Mean satisfaction rating 1.4 on a scale of 2= very satisfied, 1= satisfied. Manning and Hallo 2009. Table 4-33.

[2] Manning and Hallo 2009. Table 3-5. Codes assigned for responses to question, "What are the three things you enjoyed least about your time on the Denali Park Road today?"

would have a long-term, minor, beneficial impact on visitors' interpretive experience and safety, as the current system provides access to interpretive services, and provides a safe bus experience governed by strict adherence to road rules. It would have long-term, minor, adverse impacts on visitor access, including cost of access, access to wilderness and other park features due to the perception that there may not be enough eastbound seats and the demand for tours has exceeded capacity in some cases. The overall impact to visitor access, use and experience would be minor, long term, local and regional, and beneficial.

IMPACT MANAGEMENT COMMON TO ALL ACTION ALTERNATIVES

Both action alternatives (alternatives B and C) in this analysis use an adaptive management system of indicators and standards to manage visitor capacity, in contrast with the current numerically based system of capacity management. The system proposed by the action alternatives uses a variety of natural resources as well as social condition indicators to track changes that may result from human actions. Standards which indicate the minimum acceptable condition for each indicator would be monitored to determine whether the park's desired conditions are being met. The assigned standard for each of these indicators would be monitored through various methods, and a range of management actions are identified that would be implemented in the event of standard violation.

Establishing a set of strategies to implement in the event of a standard violation would create a nuanced and proactive management structure that could adeptly respond to individual components of the visitor's experience when those components are not reaching desired conditions. For example, by using as an indicator the numbers of vehicles at wildlife stops, specific attention would be focused on an important component of visitor satisfaction. In the case of the wildlife stop indicator, the strategy or tools include addressing non-system use, making changes to the bus schedule, removing buses from the schedule, or revising the transportation system back to a level preceding the standard violation. This would make the action alternatives responsive to the diversity of components that comprise the visitor experience.

ALTERNATIVE B

Visitor Access

Accessing Wilderness

In this alternative, the transit system would be combined with an economy tour, and these buses would provide seats both for visitors who purchased transit tickets as well as for those who purchased economy tour tickets. All passengers on this combined system could get off and re-board the bus at any point, although economy tour visitors could retain their seat for the entire trip. Furthermore, to fully optimize the capacity of the transportation system, a majority of seats on the transit/economy tour buses would be pre-booked. In addition, there will no longer be a camper bus offered under this alternative; strategies would be explored for carrying recreational equipment such as camping gear on the exterior of transit buses.

Under alternative B, campers and day hikers may have difficulty accessing park wilderness areas. With transit and economy tour service combined, certain designated transit buses would be filled to capacity with economy tour passengers. Other transit buses would be scheduled for similar departure times, designed to accommodate transit passengers such as day hikers and campers. This system should avoid undue seat competition; however, without dedicated camper buses with seats removed, the average wilderness visitor who requires more space may find it challenging to find a transit seat with enough space. This may make it difficult for a hiker carrying gear to comfortably ride a transit bus.

Hiker wait time would be an indicator under this alternative. Most visitors (at least 75% will wait 30 minutes or less and almost all visitors (at least 95%) will wait 60 minutes or less; adaptive management strategies would be employed in following years if wait times were found to exceed the standards. These strategies could include leaving more empty seats on buses, adding more buses, adjusting non-system uses, circulating empty "deadhead" buses, or moving allocation from the tour system to the transit buses. For more information on the hiker wait time indicator and standard and adaptive management in general, see chapter 2.

When compared to the no-action alternative, this alternative would benefit visitors' access to wilderness due to the codification of hiker wait times and because wait times would be monitored and managed through adaptive management.

Accessing Park Features

The transit and tour options in alternative B would continue to provide access to park features such as the Denali Visitor Center, the Eielson Visitor Center, the Teklanika and Toklat rest areas, six different campgrounds, and various trails. This alternative does not propose any changes to these features themselves, but rather proposes changes in the way those features would be accessed. Some of these features are currently underutilized, while other features are at risk of overcrowding. For example, according to park staff, approximately 50% of visitors to Denali currently enter the Denali Visitor Center, compared to a park goal of 90% of park visitors visiting that center (Denali Education Plan, 2009). Additionally, while rest areas are consistently held in high regard by visitors, the number of vehicles at rest stops has been identified as an important factor in visitor satisfaction.

Maximizing seating on all transit and tour vehicles would thereby offer the largest number of visitors an opportunity to access park features. Also, to fully optimize the transportation system, in keeping with the general concept of alternative B, the National Park Service may study the possible effects of using larger buses on a section of the Park Road. Larger buses would potentially be used only in Wildlife Viewing Subzone 1, from Savage River to Teklanika, as this road segment would not require structural upgrades to the road to accommodate larger buses. If such studies resulted in no adverse effects and standards could be maintained, larger buses could be considered up to Teklanika, leading to increased opportunities for visitors to access park features. In addition, visitors who booked a self-guiding economy tour would begin their tour at the Denali Visitor Center with a park orientation (transit services would start at the Wilderness Access Center), increasing access to this park feature.

Furthermore, alternative B's use of an adaptive management strategy would minimize impacts on features that could be potentially overutilized, such as rest stops and wildlife stops. Numbers of vehicles at rest stops and wildlife stops would be an indicator, and compliance with the standards (see chapter 2 for standards) would be monitored multiple times per season, both remotely and directly. This would help ensure continued quality of access to Park Road rest areas and wildlife stops.

Alternative B also proposes a potential change to one of the park's campgrounds, Teklanika River Campground. Over a 10-year period, this campground could become a tents-only campground, where visitors would access the campground using the park transportation system rather than their private vehicles. The intent of this change would be to optimize visitor access to the park by reducing the system inefficiency of private vehicle access. This change would open more space in the system for buses or other vehicles that can carry more people.

Although elimination of RV camping at Teklanika River would have a negative effect on the RV camping visitor by reducing opportunities to camp with an RV in Denali, alternative B would have an overall focus on optimizing access to the park as well as adding more stops at visitor centers. When compared to the no-action alternative, this would be an improvement in access to park features due to the transportation system's focus on getting more people out the Park Road and to those features. The overall supply (the number of seats available) provided by the transportation system in alternative B is expected to be greater than that of alternative A.

Cost of Access

Under alternative B, components involved in the cost of Denali Park Road access would include entrance fees, costs of tour or transit tickets, and other costs such as food and beverages. Ticket prices would span a range of cost options, from short transit trips through the longest premium tour trips. Although a dedicated low-cost tour option would not be available in alternative B, an economy tour would be available on the combined transit/economy tour buses. This would help address the current gap in the cost spectrum. Furthermore, the major purpose in combining transit with an economy tour is to provide the greatest number of visitors an affordable option for accessing the park. Combining these two services could result in buses operating at or near capacity, which would provide maximum efficiency to the system, thereby potentially lowering ticket prices. When compared to the no-action alternative, this action would benefit visitors due to the addition of more price points along the ticket cost spectrum.

Alternative B would have a minor beneficial impact on visitor access, as the adverse effects on access to wilderness would cancel some of the benefits relating to access to park features and cost improvements.

Visitor Use and Experience

Transportation Use and Experiences

Under alternative B, visitors could choose to explore the Park Road either on a combined transit / economy tour bus or on one of two premium tours offered. The combined economy tour / transit bus is briefly described above and in more detail in chapter 2. Alternative B also would offer guided premium tours. The guided premium tours in alternative B would be differentiated primarily by length: a short tour and a long tour. The premium short tour would be up to half a day long, would be offered to various designated locations up to Teklanika, and would stop at the Denali Visitor Center. The premium long tour in alternative B would be a full day experience traveling anywhere in the park up to Kantishna, but with most tours not going farther than the Eielson Visitor Center. These tours would cover a variety of tour topics and destinations along the way. Premium long tour topics and destinations would be driven by visitor demand under this alternative.

Alternative B would provide a variety of opportunities for the Denali Park Road visitor. Alternative B provides visitors the opportunity for an economy tour experience as well as various types of premium tours. Alternative B's premium tours are differentiated primarily by their length rather than by their topics, however, and as such may not offer the visitor the maximum topical diversity of Park Road experiences. The configuration of the economy/transit option in alternative B also limits the diversity of visitor opportunities on the Park Road. By combining the transit bus with an economy tour option where the passenger may not get off the bus, alternative B may not facilitate opportunities for the visitor to participate in diverse off-bus experiences such as scheduled Discovery Hikes, walks on self-guiding trails, or time spent at visitor centers or picnic areas.

When compared to the no-action alternative, alternative B would benefit visitors due to the addition of a new bus experience: the economy tour.

Park Interpretive Experiences

Alternative B makes some changes to the visitor's interpretive experience along the Park Road. This alternative's economy tour offering would provide interpretive materials to visitors who are looking for a more affordable option in a tour setting. In addition, premium tours would also offer on and off-bus interpretive experiences. These may include video camera and screen systems on the buses for better close-up wildlife viewing as well as off-bus interpretive experiences such as professional interpretive programs at destinations or guided talks at certain locations.

The economy tour would create an opportunity for visitors who would like the guidance of a tour without the higher price of a premium tour. Materials that would be included with the economy tour ticket could include guide books, lists of options for off-bus activities, and activity packs for young visitors. Self-guiding economy tour materials could also utilize technology and include items such as podcasts or other audio items. These educational items for visitors are not currently included with any ticket under a premium tour ticket, and many, such as road guide podcasts, are not currently available.

When compared to the no-action alternative, this action would benefit visitors due to the increased availability of interpretive materials for economy tour passengers.

Visitor Safety and Comfort

This alternative includes the opportunity for economy tour passengers to select and save more desirable seats for the length of their tour, which may add to their comfort.

When compared to the no-action alternative, this action would benefit visitors due to the possibility for economy tour passengers to select and save more desirable seats for the length of their tour, which may add to their comfort. There would be no change to visitor safety in this alternative.

Alternative B would have a minor beneficial impact on visitor use and experience by providing a new economy tour, new interpretive materials, and potentially providing more comfort for economy tour passengers.

Cumulative Effects

The past, present, and reasonably foreseeable future actions described for alternative A would contribute to the cumulative effects of alternative B. The cumulative impacts of adopting alternative B on visitor access, use and experience would be long-term, moderate, and beneficial. The impacts of alternative B would result in a substantial contribution to the cumulative effects realized by the past, present, and reasonably foreseeable future actions.

Conclusion

Under alternative B, changes to the park's transportation system would focus on optimizing the number of visitors who can access the park. Implementation of this system would affect most components of the visitor experience positively. Alternative B could have a negative impact on access to wilderness due to transportation changes such as combining the transit system with an economy tour and not having configured camper buses. It would have long-term, minor, beneficial impacts on all other elements, including the cost of access, access to park features, visitors' transportation and interpretive experience, and visitor comfort. Alternative B would result in a long-term, local and regionwide, minor, beneficial impact on visitor access, use, and experience.

ALTERNATIVE C

Visitor Access

Alternative C emphasizes providing the visitor with a wide range of visitor opportunities, which would generally benefit the type and quality of access to park resources, such as wilderness, and developed features, such as rest areas and visitor centers. The quantity of visitors accessing the park is not the primary focus of the alternative. Thus, while an individual visitor's access to park elements may improve under this alternative, the number of visitors accessing the Park Road is not optimized.

Accessing Wilderness

Under alternative C, transit buses would be separate from economy tour buses, a system designed to facilitate spontaneity, freedom, and access to a range of off-bus experiences for the independent traveler. Additionally under this system, some seats would be reserved from pre-booking in order to enable spontaneous trip planning for walk-in visitors and to pick up eastbound hikers. Economy tour buses would not retain open seats, but if open seats were available on eastbound buses, those buses would be permitted to pick up hikers. With a separate economy tour available, it is expected that visitors who are now using the transit system as a form of economy tour would switch to the economy tour bus, thereby freeing transit seats for wilderness visitors and their equipment. This alternative also provides a dedicated, 28-seat camper bus for backcountry visitors, with space in the back of the bus to stow gear.

Similar to alternative B, hiker wait time would be an indicator under this alternative. Most visitors (at least 75% will wait 30 minutes or less and almost all visitors (at least 95%) will wait 60 minutes or less; adaptive management strategies would be employed in following years if wait times were found to exceed the standards. These strategies could include leaving more empty seats on buses, adding more buses, adjusting non-system uses, circulating empty "deadhead" buses, or moving allocation from the tour system to the transit buses. For more information on the hiker wait time indicator and standard and adaptive management in general, see chapter 2.

Accessing Park Features

Alternative C promotes a diversity of visitor opportunities and would include some alterations to the method of accessing various park features, such as visitor centers, rest areas, campgrounds, day use areas, and frontcountry trails. The transit and tour options in alternative C would continue to provide access to park features such as the Denali Visitor Center, the Eielson Visitor Center, the Teklanika and Toklat rest areas, six different campgrounds, and various trails. For the most part, this alternative focuses on the access to those features and does not propose any changes to these features themselves.

Some of these features are currently underutilized, while other features are at risk of overcrowding. For example, according to park staff, approximately 50% of visitors to Denali National Park currently enter the Denali Visitor Center, compared to a park goal of 90% of park visitors visiting that center (NPS 2009h). Additionally, while rest areas are consistently held in high regard by visitors, the number of vehicles at rest stops has been identified as an important factor in visitor satisfaction, as well as the number of vehicles at wildlife stops.

Alternative C's provision of a dedicated economy tour offers a potentially large number of visitors the opportunity to access the Denali Visitor Center. All economy tours would originate at either the Wilderness Access Center or the Denali Visitor Center. In addition, the alternative's use of an adaptive management strategy could benefit potentially overutilized park features such as rest stops and wildlife stops. Numbers of vehicles at rest stops and wildlife stops would be indicators, and compliance with the standards for those indicators would be

monitored multiple times per season both remotely and directly. For example, in Wildlife Viewing Subzone 1, the standard is "No more than 12 buses at one time with a total of no more than 16 vehicles" at the Teklanika Rest Stop. This will help ensure continued quality of access to Park Road rest areas.

Alternative C also proposes minor changes that would impact access to one of the park's campgrounds, Teklanika River Campground. Private vehicles going into the Teklanika River Campground for their 3-day minimum stay would only be able to travel westbound on the Park Road during designated periods of low-traffic volume. This could create inconvenience in campers' travel planning.

When compared to the no-action alternative, this action would benefit visitors, due to the increased potential for access to visitor centers. In addition, the transportation system's overall supply (total number of seats available) provided in alternative C is expected to be slightly greater than that provided in alternative A.

Cost of Access

The components of the cost of Denali Park Road access would include entrance fees, costs of tour or transit tickets, and other costs such as food and beverages. Ticket prices would span a range of options, from short transit trips through the longest premium tour trips. In alternative C, a dedicated, low-cost tour option would be available. This additional offering would help fill a gap in the cost spectrum. This spectrum would include both lower- and higher-cost transportation options for visitors. When compared to the no-action alternative, this action would benefit visitors due to the addition of more price points along the ticket cost spectrum.

Alternative C would have a minor beneficial impact on visitor access by providing a low cost tour, a separate transit system, and more opportunities to access park visitor centers.

Visitor Use and Experience

Transportation Use and Experiences

Under alternative C, visitors can choose to explore the Park Road in one of many ways: on a municipal-style transit bus system, designed to facilitate independent exploration; on an economy tour bus with interpretive materials; or on one of several premium tours offered. The economy tour and transit bus opportunities are briefly described above and in more detail in chapter 2. The guided premium tours available in this alternative would include a variety of options of different lengths and topics designed to meet the needs of a diverse audience, and could include a focus on such topics as birding or wolves. Premium tours in alternative C also would ensure park visitors interact with at least one NPS interpretive facility or staff member during their visit, rather than only with their bus driver. Tours would also include opportunities for off-bus experiences, such as guided walks and demonstrations.

Alternative C would provide a wide range of visitor opportunities, and would give visitors the option of either an economy tour with passive interpretation or a transit bus experience. For the premium tour visitor, alternative C would provide a range of tour topics tailored to various audiences. When compared to the no-action alternative, this action would benefit visitors due to the addition of a dedicated economy tour and premium tours that focus on specialty topics visitors might be interested in.

Park Interpretive Experiences

Alternative C proposes several changes to the visitor's interpretive experience along the Park Road. This alternative would offer a separate economy tour that would provide the visitor with an independent, affordable, on-bus park road experience. This experience would be a self-guiding tour provided via a dedicated bus system. Interpretive materials provided on this tour could include guide books, lists of options for off-bus activities, and activity packs for

young visitors. Self-guiding economy tour materials could also utilize technology and include items such as podcasts or other audio items. The premium tours in alternative C would also offer on- and off-bus interpretive experiences. These may include video camera and screen systems on the buses for better close-up wildlife viewing as well as off-bus interpretive experiences such as professional interpretive programs at destinations or guided talks at certain locations.

Alternative C may offer the visitor increased interpretive options, primarily due to the addition of a separate economy tour with its own interpretive offerings. This would create a new opportunity for visitors who would like the guidance of a tour without the higher price of a premium tour. These educational items for visitors, although available for separate purchase, are not currently offered with the purchase of any ticket less than a premium tour ticket, and many, such as road guide podcasts, are not currently available at all.

Alternative C's addition of a new layer of interpretation through creation of the dedicated economy tour and addition of themed specialty tours would offer visitors a unique interpretive experience. When compared to the no-action alternative, this action would benefit visitors due to the potential increase in variety of interpretive options.

V*isitor Safety and Comfort*

Alternative C would provide for the possibility of changing the tour buses used on the Park Road. To maximize a range of visitor opportunities, in keeping with the general concept of alternative C, tour sizes would be tailored to the needs and constraints of that particular tour program. Consequently, the size and accoutrements of those tour buses could change as well, although they would not exceed the current design standards for bus size. In addition, premium tours in this alternative could increase visitor comfort on tour buses by reducing the number of seats on these buses. For these reasons, alternative C would offer potential long-term, moderate, beneficial impacts on visitor comfort. There would be no change to visitor safety in this alternative.

Alternative C would have a moderate beneficial impact on visitor use and experience by providing a separate economy tour, themed specialty tours, and potentially providing more leg room on the premium tours.

Cumulative Effects

The past, present, and reasonably foreseeable future actions described for alternative A would also contribute to the cumulative effects associated with alternative C. When the impacts from alternative C are combined with these other past, present, and reasonably foreseeable future actions, there would be long-term moderate beneficial cumulative effects under alternative C, and alternative C would contribute substantially to the cumulative benefits.

Conclusion

Under alternative C, changes to the park's transportation system would focus on maximizing a range of visitor opportunities. Implementation of this system would affect all components of the visitor experience positively. Alternative C would have a long-term, minor beneficial impact on visitor access, and a moderate beneficial impact on visitor use and experience. Overall, alternative C would have a moderate, local and regionwide, beneficial impact on visitor access, use and experience.

TRANSPORTATION SYSTEM AND TRAFFIC

METHODOLOGY AND ASSUMPTIONS

The quality of the transportation system is primarily dependent on how efficiently and effectively the system transports visitors through the park. Its quality is also defined by how the system provides transportation services while also minimizing system costs, road traffic, or degraded traffic flow on the road network.

Measure

Impacts to the transportation system and traffic were analyzed relative to the transportation system options available to visitors and employees under each alternative. Implementing any of the action alternatives could result in changes in destinations for tour and transit service, changes in use of tour versus transit service, and changes in other vehicle use.

The assumptions used to evaluate transportation system and traffic impacts when the services in the action alternatives (not including alternative A) are fully implemented include the following:

- All vehicles traveling on the restricted section of the Park Road would be required to follow a set pattern for vehicle movement (e.g. number of vehicles per hour per road section) to meet standards for achieving desired conditions.
- When allocating vehicle use within the transportation system, the transit service would have priority.

Intensity Definitions

Minor: Changes to the efficiency and effectiveness of transporting visitors through the park would be slight. However, these changes would not appreciably alter the existing transportation services in the park. Some small increases or decreases in the vehicle or passenger volumes on the park road could occur. Changes to transportation system costs and/or road traffic conditions would be minimal.

Moderate: Changes to the efficiency and effectiveness of transporting visitors through the park would occur. Modest increases or decreases in the vehicle volumes or passenger volumes on the park road could occur. Changes to transportation system costs and/or road traffic conditions would occur.

Major: Changes to the efficiency and effectiveness of transporting visitors through the park would be obvious. Substantial increases or decreases in the vehicle volumes or passenger volumes on the park road could occur. Changes to transportation system costs and/or road traffic conditions would be substantial.

ALTERNATIVE A

Analysis

Alternative A assumes that current conditions would continue, and no changes would be made to the overall Park Road transportation system. Vehicle capacity for the transportation system would remain the same. Vehicle use on the restricted section of the Park Road would continue to be managed to maintain a 10,512 seasonal limit set in the 1986 general management plan and then formalized in regulations in 2000.

The transit service would originate at the Wilderness Access Center and provide access to destinations along the length of the Park Road. The transit bus schedule would be organized to meet demand with a daily limit of 36 buses and would depend on some transit bus seats remaining unsold, to allow for the hikers and campers boarding west of

Savage River to be picked up along the Park Road. The demand on a day during peak season may be more than what is available on a single bus. The number of seats intentionally left empty for hikers and campers boarding west of Savage River may be insufficient by themselves to meet the demands of a busy day during peak season. Alternative A depends on additional transit service seats remaining unsold. Particularly since the time and location of hikers and campers may not necessarily match up to available empty seats, the system has relatively little flexibility for meeting the needs of visitors who board west of Savage if the transit service were suddenly to become busier (HDR 2009).

On the other hand, no visitor has ever been left by the side of the park road overnight, and the target of no more than a one hour eastbound wait time for hikers is written into the concession operating plan. Extra buses are routinely sent out when it is expected that the hiker wait time standard would not be met.

Alternative A would continue to have no self-guided economy tour.

The three tours provided by park concessioners would continue to operate as they do currently. The Tundra Wilderness Tour buses would be assigned based on demand on each day, which, based on 2008 numbers, fluctuated from a minimum of 12 to the daily maximum of 30 provided for in the general management plan. The Tundra Wilderness Tour schedule would remain the same with buses departing in two clusters, one leaving over a 2.5 hour period in the early morning; the other leaving over a 2 hour period in the afternoon that can carry passengers who arrived in Denali on the noon train. Over the years 2006-2008, analysis of actual Tundra Wilderness Tour ridership for the 111-day allocation season shows that almost all available seats were being sold, with some additional vacancy (6%) created by visitors who do not show up for their trip. Data for the analysis came from the Savage River check station database and Doyon-ARAMARK Joint Venture Ridership Summaries, 2006-2008 (HDR 2009).

The Denali Natural History Tour buses would also be assigned based on demand on each day, which, based on 2008 numbers, fluctuated from 7 up to the maximum allowed of 23. The Kantishna Experience buses would continue to be offered once or twice per day. Other vehicle use, including those used for Park Service maintenance and operations, professional photography and commercial filming, Kantishna inholder access, Teklanika River Campground access, educational groups, and researchers, would continue to be managed as described under alternative A in chapter 2.

From 2007-2010 the Denali Park Road Capacity Study has been collecting information for numbers of vehicles at wildlife stops on the restricted section of the park road, in viewscapes, and at rest areas and visitor centers. The current average number of vehicles stopped at wildlife sightings has ranged from 1.58 to 1.69 over the last 4 years based on staff observations. These values represent only stops to observe wildlife with at least one vehicle present. In these observations, typically at least 50% of the wildlife stops have only one vehicle present. 75% of the wildlife stops have one or two vehicles present. The maximum value reported in staff observations is 7 and this value occurs approximately 1% of the time (Phillips and Borg 2009).

Teklanika and Toklat are two of the more popular rest areas along the Park Road. Staff observations reported a maximum of 7 buses and 10 total vehicles present at Teklanika at any one time. A maximum of 11 buses and total vehicles were parked at one time at the Toklat Rest Area. Staff observations at the Eielson Visitor Center reported a maximum of 10 buses and 13 total vehicles present at any one time (Phillips et al. 2010).

Because of the high number of vehicles at some rest areas, wildlife stops, and the Eielson Visitor Center during the peak season, alternative A would not meet the overall planning objectives described in chapter 1 to maximize system flexibility to meet future visitor demand and to provide stability and predictability in the system. Transportation system transit bus capacity would be exceeded, and in the case of the Tundra Wilderness Tour, tour bus capacity would also be exceeded some days during the peak season. Changes to the efficiency and effectiveness of transporting visitors through the park would be slight. Some small increases or decreases in the vehicle or passenger volumes on the park road would occur. Changes to transportation system costs and/or road traffic conditions would be minimal. Therefore, Alternative A would have a localized, long-term, minor, adverse impact on the transportation system.

Cumulative Effects

Past, present, and reasonably foreseeable future actions with the potential to affect the transportation system include past and future road maintenance. Past actions, such as the construction of the Eielson Visitor Center, the Toklat Rest Area, the Savage Area Rest Area and rest area trails; the construction of new visitor facilities in the entrance area; the rehabilitation of several road segments; and pullout improvements have had local, long-term, moderate, beneficial impacts on the transportation system due to the improvement of transportation facilities and infrastructure.

Past planning efforts, such as the 1997 E*ntrance Area and Road Corridor Development Concept Plan*, the *Development Concept Plan for the Park Road Corridor* and the 1987 Addendum have had local, long-term, moderate, beneficial impacts on the transportation system. Continued implementation of the business plan, the general management plan, road design standards, and the vehicle use on the park road regulations also have local, long-term, moderate, beneficial impacts on the transportation system through the implementation of transportation efficiencies prescribed in these plans, standards, and regulations.

The road rehabilitation in the Porcupine Forest Section of the Park Road scheduled for 2012 would also have a local, long-term, beneficial impact to the transportation system due to the improvement of transportation infrastructure.

Overall, the local, long-term, minor, adverse impact of alternative A, when combined with the local, long-term, moderate, beneficial impacts of the past, present, and foreseeable future actions would result in local, long-term, moderate, beneficial impacts to the transportation system. Alternative A would contribute a small, adverse increment to overall cumulative impacts.

Conclusion

Alternative A would have a local, long-term, minor, adverse impact on the transportation system due to transit bus capacity and Tundra Wilderness Tour bus capacity being exceeded on some days during the peak season due to the existing vehicle limits.

ALTERNATIVE B

Under alternative B, combining transit and a self-guided economy tour, which is described in more detail in chapter 2, would result in some buses operating at near capacity. The transit/economy tour would begin at the Denali Visitor Center with a park orientation. The transit services would then start at the Wilderness Access Center and provide access to the entire length of the Park Road.

This alternative may require regularly reallocating buses between transit and premium tour services. It may also require reallocating vehicle use between the transportation system and other vehicle use of the Park Road. Reallocation of buses and vehicle use would depend on demand based

on the number of reservations and the number of tickets sold daily.

The guided premium tours described in chapter 2 would be available for 100% pre-booking for all visitors. The predictability in visitor demand would allow for greater efficiency of bus scheduling and use. The short tour would be offered to designated locations throughout Wildlife Viewing Subzone 1 (Savage River to Teklanika); the long tour would be offered to destinations the length of the Park Road. Both tours would allow for flexibility in where the tour begins, either at the Wilderness Access Center or with a pick up at a local hotel.

Larger buses, if determined to not have significant impacts through the proposed study described in chapter 2, could increase the seating capacity of the transportation system.

Other vehicle use, including that associated with NPS staff, professional photographers, commercial filming, Kantishna inholder access, Teklanika River access, and researchers, may be reallocated to benefit the transportation system as described in chapter 2.

Private vehicles used to access Teklanika River would travel westbound on the Park Road during a designated time period. Within 10 years, Teklanika River could become a tents-only campground with visitors using the transportation system for access, further reducing the number of non-transit and non-tour vehicles in the park. That number of vehicles could then be replaced by transit and tour buses.

The traffic model developed by the Minnesota Traffic Observatory (Morris et al. 2010) was used to assess various schedules under alternative B. A sample schedule was found that, based on the model output, would meet all of the standards set for the indicators described in Chapter 2. This schedule included 35 transit system/ economy tour buses and if this number were run every day of the season it would result in a 10.5% increase in seat availability over Alternative A. The schedule also included 30 short tours per day, with a destination of the Teklanika Rest Area, and if this number were run every day it would result in a 30.4% increase in seating capacity compared to the Denali Natural History Tour in alternative A. For the long tour, the schedule accommodated 22 buses per day, with 7 buses going to the Toklat Rest Area, 13 to the Eielson Visitor Center, and 2 to Kantishna. Again, if this full complement of buses were to be run every day, there would be an 8.2% decrease in seating capacity compared to the Tundra Wilderness Tours and Kantishna Experience in alternative A. A total of 10 lodge buses were included in the daily schedule when running the model, 4 making day trips and 6 that started in Kantishna, making round trips to transport overnight guests. This schedule had a total of 87 concessioner buses (i.e. not including lodge buses) departing from the Savage River check station every day. In alternative A, the current daily limits would be maintained which would allow for 89 buses departing from the Savage check station per day (including the Denali Natural History Tour), however the concessioner cannot run this level of buses per day every day because of the seasonal limits. The average daily concessioner buses under alternative A is 77.

Under alternative B there would not be seasonal limits, so even though the daily limit is lower than alternative A, this sample schedule for alternative B would suggest a 10.7% increase in seat availability as compared to alternative A, with a seasonal daily average of 85 concessioner buses per day.

One limitation of the model is non-bus vehicles: the restriction on these vehicles in alternative B, such as the elimination of RV camping at Teklanika, could not be incorporated (Morris et al. 2010).

The numbers from the modeling should be considered as initial estimates. A more

efficient schedule would be achieved as a result of the experience gained through implementation of the model within the flexibility of the adaptive management approach described in chapter 2.

Alternative B would maximize seating on all transit and tour vehicles. The transportation system would be more highly structured. A majority of seats on both transit and tour buses would be filled by pre-booking visitors allowing managers to predict daily vehicle needs and maximize the flexibility of the system to accommodate visitor demand. Alternative B would also maximize the flexibility of the system to accommodate visitor demand and, with the potential use of larger buses, would increase the capacity of the transportation system, having a local, long-term, moderate, beneficial impact on the transportation system.

Cumulative Effects

Past, present, and reasonably foreseeable future actions with the potential to affect the transportation system are the same as described for Alternative A.

Overall, the local, long-term, moderate, beneficial impact of alternative B, when combined with the local, long-term, moderate, beneficial impacts of these other actions would result in local, long-term, moderate, beneficial impacts to the transportation system. Alternative B would contribute a substantial benefit to overall cumulative impacts.

Conclusion

Overall, alternative B would have a local and regionwide, long-term, moderate, beneficial impact on the transportation system and traffic by providing the framework for a modest increase in the seasonal capacity of the transportation system.

ALTERNATIVE C

Under alternative C, a self-guided economy tour would be separate from transit. Offering the two services separately would decrease the number of people on transit buses. The self-guiding tours would originate at both the Wilderness Access Center and Denali Visitor Center. Economy tour buses, if seating is available, would pick up eastbound hikers. The creation of a new wildlife viewing subzone 3 (from the Eielson Visitor Center to the Wonder Lake junction) would be managed for the lowest traffic volume on the Park Road.

Transit would begin at the Wilderness Access Center and access the full length of the Park Road. Buses would turn around at various destinations which may require a change of buses for transit riders traveling farther into the park. For example, the park might consider a loop shuttle between Eielson and Kantishna, such that a transit service originating at the entrance area would only go as far as Eielson and visitors would use the loop shuttle to go farther west. Transit would also provide transportation to the Wilderness Access Center for tour passengers who choose to leave their tour. Transit buses would also pick up hikers. Transit buses would run on a regular schedule to provide a high level of predictability and reliability, and frequency would be scheduled to meet demand.

A variety of premium tours would be developed and would be up to 100% pre-booked. Passengers would be picked up at the Wilderness Access Center or at local hotels, providing the same flexibility as in the no-action alternative. Premium tours would not pick up hikers.

Vehicle use may be reallocated to benefit the transportation system as described in chapter 2. In this alternative, NPS employees could still use private vehicles to access duty stations on the restricted portions of the Park Road (Savage River to Wonder Lake) during periods of low traffic volume, and the Teklanika River could still be accessed by

private vehicles during periods of low traffic volume.

The traffic model developed by the Minnesota Traffic Observatory (Morris et al. 2010) was used to assess various schedules under alternative C. A sample schedule was found that, based on the model output, would meet all of the standards set for the indicators described in Chapter 2. This sample daily schedule included 22 transit system buses with destinations of Teklanika, Toklat or Eielson; and an hourly loop shuttle between the Eielson Visitor Center and Kantishna from 10 am to 6 pm. Not including this loop shuttle (because it does not add to the overall visitor capacity of the system) this is a 49.1% decrease in seat availability as compared to the transit system in Alternative A. The sample schedule had 16 Economy Tour buses with destinations of Teklanika and the Eielson Visitor Center. If the transit and Economy Tour seating capacities are combined, there is a 33.9% increase in seat availability compared to the transit system in alternative A. This sample schedule also included 43 premium tours, with destinations of Teklanika (24), Toklat (5), Eielson Visitor Center (12) and Kantishna (2), and 4 specialty tours with destinations of either Toklat or the Eielson Visitor Center. If the premium tours with a destination of Teklanika are compared to the Denali Natural History Tour in alternative A, there is a 3.8% decrease in seat availability. By combining the remaining premium tours and the specialty tours, there is an 11.6% decrease in seat availability compared to the Tundra Wilderness Tour and Kantishna Experience tours in alternative A. Overall, if the seat availability for the premium and specialty tours of alternative C is compared to the combined seat availability of the Denali Natural History Tour, Tundra Wilderness Tour, and Kantishna Experience of alternative A, there is a 9.2% decrease in premium/specialty seat availability in alternative A. A total of 10 lodge buses were included in the daily schedule when running the model: 4 making day trips and 6 that started in Kantishna, making round trips to transport overnight guests. This schedule had a total of 85 concessioner buses (i.e. not including lodge buses) departing from the Savage Check Station every day. In alternative A, the current daily limits would be maintained, which would allow for 89 buses departing from the Savage check station per day (including the Denali Natural History Tour), however the concessioner cannot run this level of buses per day every day because of the seasonal limits. The average daily concessioner buses under alternative A is 77. Under alternative C there would not be seasonal limits, so even though the daily limit is lower than alternative A, this sample schedule for alternative C would suggest a 3.8% overall increase in seat availability as compared to alternative A, with a seasonal daily average of 84 concessioner buses per day.

One limitation of the model is how non-bus vehicles were handled; the restriction on these vehicles in alternative C could not be incorporated (Morris et al. 2010).

The numbers from the modeling should be considered as initial estimates. A more efficient schedule would be achieved as a result of the adaptive management approach described in chapter 2.

Alternative C would reduce the modes of transportation, limiting how people can access the park on transit or tour buses, causing modest increases in passenger volumes, which would have a local, long-term, moderate, adverse impact on the transportation system.

Conversely, alternative C would maximize the flexibility of the transportation system described in the planning goals and objectives in chapter 1. The transportation system would need to be reorganized to incorporate self-guiding economy tour buses. Different sized buses may need to be acquired to meet the demand of the various premium tours and group size, which would be an additional cost. Alternative C would

also require greater coordination of the transit, self-guiding tour, and premium tour bus systems. These impacts would be localized, short-term, moderate, and adverse as the transportation system became established. Once established, the transportation system would also have long-term moderate beneficial impacts from the increased seating capacity and the variety of loops and tours.

Cumulative Effects

Past, present, and reasonably foreseeable future actions with the potential to affect the transportation system are the same as described in alternative A.

Overall, the impacts of alternative C, when combined with the local, long-term, moderate, beneficial impacts of the actions described above would result in local, long-term, moderate, beneficial impacts to the transportation system. Alternative C would contribute a substantial beneficial increment.

Conclusion

Alternative C would have a local, short-term, moderate, adverse impact on the transportation system due to the need to incorporate a separate self-guiding tour bus system, the potential need to acquire different-sized buses to meet the demand of the various premium tours, and the need for increased coordination among transit buses, self-guiding tour buses, and premium tour buses. Over the life of this plan, alternative C would have a moderate local and regionwide beneficial impact on the transportation system and traffic by providing for a focus on opportunities for specialty-themed tours, establishing an economy tour, and providing a slight increase to the seasonal capacity of the transportation system.

WILDLIFE AND WILDLIFE HABITAT

METHODOLOGY AND ASSUMPTIONS

The effects of implementing the various management alternatives on wildlife and wildlife habitat are analyzed in this section. The impact intensity thresholds, analyses, and conclusions in this section apply to all wildlife species and habitat along the road corridor, as described in chapter 3. Given the diversity and abundance of wildlife species along the Park Road corridor, and the relative similarity of potential effects from the three alternatives, the following impact analyses are discussed and measured on a habitat basis instead of a species basis.

The analysis is primarily presented qualitatively rather than quantitatively because of the conceptual nature of the alternatives. The planning team based the wildlife impact analyses and conclusions in this section on professional judgment, information provided by experts in the NPS, park staff insights, and a review of existing literature and studies.

Measure

The analysis of the effects of the alternatives on the five large mammal species and other wildlife (e.g., avian and small mammal species) is based on the importance of affected habitat type, habitat location, and changes in habitat quality. The changes in habitat quality for various wildlife species could result in changes in the animals' behavior, population trends, movement or migration patterns, and the potential for habituation to humans.

Intensity Definitions

Minor: Effects on wildlife and wildlife habitat quality would not be outside the natural range of variability and would not have any notable effects on the wildlife species or the natural processes sustaining their habitat. The effects could result in minimal changes to habituation to humans and would not affect the regional population of the species.

Moderate: Effects on wildlife and wildlife habitat quality would cause changes to the animals' feeding, mating, and caring for young. The effects could intermittently be outside the natural range of variability. Some limited changes to habituation to humans would be expected. Changes to the regional species population would be minimal, but some changes to localized populations of some species may be apparent and measurable.

Major: Effects on wildlife and wildlife habitat quality would cause substantial changes to the animals' behavior (feeding, mating, migration, and caring for young). The effects would be outside the natural range of variability. Distinct changes to habituation to humans would be expected. Changes to regional species population would be apparent, and changes to localized populations of multiple species would be very apparent and measurable.

ALTERNATIVE A (NO-ACTION ALTERNATIVE)

Analysis

Under alternative A, the transportation system on the Park Road would continue to be managed to maintain the previously set 10,512 vehicles per year maximum and to provide the current offerings of tours and off-bus activities. This continued operation would maintain the average of about 83 total buses per day throughout the visitation season (concessioner and lodge buses). The system volume on the Park Road could be expected to peak at about 91 total buses per day during mid-summer months, but only

reach about 71 total buses per day through the first week of June during the spring shoulder season. Under alternative A, the highest level of bus traffic would continue to occur during the peak hours of the day (late morning through mid-afternoon), with notably lower traffic volumes in the shoulder periods of the day (early to mid-morning and late afternoon through evening).

The vehicle traffic and off-bus human activity along the Park Road that results from the implementation of alternative A would continue to have a variety of effects on wildlife and wildlife habitat along the Park Road corridor. Adverse effects such as increased stress in individuals, habitat fragmentation, and disturbances to foraging, movement, or caring for the young would continue to occur.

For example, as noted in chapter 3, recent NPS Dall sheep monitoring indicates that sheep generally move farther away from the road as traffic volume increases, which affects sheep behavior, such as foraging (Putera and Keay 1998). Similarly, another NPS study of grizzly bears along the Park Road revealed that bears tend to move faster when crossing the road (relative to immediately before and after the crossing) and that bears tend to rest in an inactive state for longer periods of time farther from the road. These results indicate possible increases in stress on the animals, and that bears might not be comfortable enough to rest for long periods near the road (Mace et al. 2009).

Other wildlife studies along the Denali Park Road have suggested that these road-use effects on wildlife may be more limited than they were in the past (e.g., early 1970s). However, it is very important to note that this observation could result from individual animals becoming habituated to human or vehicle presence along the road corridor over the years (Burson et al. 2000). For example, the Mace et al. 2009 study reports that there was a significant correlation between higher traffic on the road and an increased level of grizzly bears crossing the road. If the animals are not subjected to a negative reinforcement from the stimuli (e.g., the vehicle traffic), they may become habituated to, or more accepting of, the stimuli over time (Burson et al. 2000). Thus, monitoring the movement and behavior of habituated individuals may not reveal other adverse effects on wildlife individuals or species that avoid the road corridor during high use periods.

Ample research and documented principles of wildlife biology support the conclusion that human activity along the Park Road has overall adverse effects on wildlife and wildlife habitat. Disturbances to wildlife habitat from active human uses can have both immediate impacts and long-lasting, or permanent, adverse impacts on wildlife. For example, the immediate response of many animals to human disturbances, such as vehicle traffic or off-bus human activity, often involves a change in behavior, such as fleeing, a cessation of foraging, or altering reproductive behavior (Taylor and Knight 2003, Knight and Cole 1991). Over time, the cumulative energy losses from these on-going disturbance reactions and/or the resulting increased stress levels come at the cost of energy resources needed for an individual's survival, growth, and reproduction (Geist 1978).

Taking it one step further, if multiple wildlife individuals of a species burn energy to respond to human or vehicle disturbances or actively avoid areas of their normal range due to human activity (e.g., road corridor and transportation nodes), this energy and habitat loss can affect the overall carrying capacity of the habitat (Taylor and Knight 2003, Stalmaster 1983).

As it relates to alternative A, individual vehicles and/or queues of multiple vehicles along the Park Road would continue to adversely affect wildlife behavior, movement, or stress levels. Both moving vehicles and parked vehicles would continue to have adverse effects. Some wildlife that

become stressed from human or vehicle presence along the road would continue to be forced to burn energy to avoid the disturbances or the road corridor entirely. The stressed wildlife could also alter their preferred movement and migration route across or through the road corridor and could also forgo ideal foraging or resting areas. In most cases, these effects would be greatest during the peak hours of the day, when vehicle traffic on the Park Road is highest (e.g., late morning through mid-afternoon).

While some individual animals would continue to be adversely affected by avoiding the vehicle and human disturbances in the corridor, other individual animals would continue to become habituated to human/vehicle presence. On the surface, this effect does not appear adverse because the animals are not displaced or flushed from their preferred foraging areas, resting areas, or migration routes. However, habituation to humans can be a very adverse effect to wildlife (and humans), particularly if the wildlife individuals encounter human activity in other areas of the park or beyond park boundaries.

In addition to the effect of vehicles on wildlife, some wildlife and wildlife habitat would continue to be adversely affected by off-bus visitor activities at the transportation nodes along the full length of the Park Road. Some examples of these impacts are noise, vegetation trampling and social trails, and human presence seen or smelled by wildlife.

Under alternative A, these impacts from off-bus activities would continue to be limited to areas around the developed transportation nodes along the road, as per the 2006 *Backcountry Management Plan*. Alternative A would also maintain the current management zones as defined by the 1997 *Entrance Area and Road Corridor Design Concept Plan*. These management zones could allow some increases in vehicle use and transportation system development between Eielson and Wonder Lake—currently a less developed segment of the road corridor.

Also, under alternative A, the professional photography permit program would continue to allow five road permits per day for private photography vehicles via a lottery system. The park's commercial filming program would also grant a discretionary number of special use permits (independent of photography permitting). In addition to adding to the Park Road's overall traffic volume, the private vehicles associated with photography and filming could also be parked along the Park Road corridor for lengthy periods of time. This could continue to result in prolonged disturbances and impacts to wildlife behavior, movement, and stress levels.

To help assess visitor experience and resource conditions, park staff would continue to conduct random, informal visitor surveys and resource monitoring (e.g., wildlife monitoring) under alternative A. However, these efforts would not be part of formalized, quantified adaptive management program, even though continuing research into quiet night effects and sheep crossing problems may initiate changes to the traffic limits.

All of the above effects would continue under alternative A. Overall, the continued vehicle use on the Park Road and associated human activity under alternative A would continue to have a long-term, moderate, adverse, and local impact on wildlife and wildlife habitat along the Park Road corridor. These impacts would continue to occur each year during the visitation season, and would include disturbances to wildlife feeding, mating, caring for young, and/or movement. The effects would result in some individual animals becoming more habituated to humans and changes to localized populations of some species. The alternative would only have negligible effects on regional species populations.

Cumulative Impacts

Several past, present, and reasonably foreseeable future projects and actions in the vicinity of the Park Road corridor have had and will have notable effects on the wildlife and wildlife habitat in the area. Many of these projects and actions are implemented by the National Park Service, while others are implemented by other local, state, and federal agencies as well as other private entities and individuals.

As land development and human activity continues to occur in and outside the park, additional impacts to wildlife are likely to occur. Private land development along Alaska Highway 3 in Healy, Nenana Canyon, and Cantwell will continue to displace and fragment large mammal habitat areas and migration corridors along the park's eastern boundary. Tourism-related commercial development in the area will likely continue to introduce higher levels of visitation in the park and on surrounding lands, which will increase adverse noise and disturbance impacts on large mammals. Sport hunting and other backcountry recreation activities on lands adjacent to the park will continue to affect wildlife that inhabit the park as well. Subsistence hunting and trapping, including the potential use of off-road vehicles for subsistence uses, would also result in adverse impacts on wildlife and wildlife habitat in the area due to short-term and localized reductions in populations of some species. Permitted motorized uses in isolated areas (e.g., Kantishna Hills), can also cause noise and other human disturbances that have adverse impacts on wildlife behavior, movement, or stress levels.

Various local recreation development and maintenance projects along the Park Road corridor have and will continue to displace and disturb areas of habitat along the corridor. Park campground use, activity at Kantishna lodges and rest area development result in areas of habitat displacement and expanded nodes of increased human activity and noises. Projects and actions related to Park Road development and maintenance also have adverse impacts on wildlife and wildlife habitat by introducing short-term construction noise impacts and displacing relatively small areas of habitat. Examples of such projects and actions include the intervisible pullout project (between Mile posts 73 and 86), the gravel acquisition plan, and regular Park Road maintenance. Also, the 1983 *Development Concept Plan* (and addendum of 1987) for the Park Road corridor prompted a variety of projects that expanded various visitation and maintenance facilities along the corridor.

The above-mentioned actions and projects generate noise, human activity, and/or land development that result in a direct loss of wildlife habitat, behavioral changes in wildlife, or fragmented migration routes of Denali wildlife. However, some of these adverse impacts to large mammals in Denali National Park and Preserve are partially offset by beneficial impacts of other projects and actions. For example, the park's general management plan and backcountry management plan included many provisions that help minimize adverse impacts to wildlife from recreational uses in the park. These plans promote the use of a limited-access transportation system and a reduction in private vehicle traffic on the Park Road. These plans also establish and maintain a "no formal trail" policy for Denali Wilderness units. The park also has several past and future projects and plans that expand visitor education facilities and programs. With proper education opportunities for park users, some visitation-related wildlife disturbances can be minimized or avoided. Also, the park's road design standards, which dictate how the historic Park Road will be maintained, provide limitations on additional road development and widening.

Collectively, the other past, present, and reasonably foreseeable future projects and actions would have long-term, moderate, adverse, and local to regionwide impacts on wildlife and wildlife habitat in the park.

When the likely effects of the actions in alternative A are added to the effects of these other past, present, and reasonably foreseeable future actions, there would be a long-term, moderate, adverse, and local to regionwide cumulative impact on wildlife and wildlife habitat. Alternative A would contribute a medium, long-term, adverse increment to this cumulative impact.

Conclusion

The continued implementation of alternative A would result in long-term, moderate, adverse, and local impacts to wildlife and wildlife habitat. These effects would primarily result from moving vehicles and parked vehicles along the Park Road and off-bus human activity at transportation nodes. The effects would involve adverse impacts to wildlife behavior and habitat use, movement, and stress levels.

ALTERNATIVE B

Analysis

Under alternative B, vehicle travel and off-bus visitor use along the Park Road would continue. This vehicle traffic and human activity would continue to have a variety of notable adverse effects on wildlife and wildlife habitat along the road corridor similar to the effects described in the analysis of alternative A above.

Individual vehicles and/or queues of multiple vehicles (moving or parked) along the road would continue to adversely affect wildlife behavior, movement, and/or stress levels. Some individual animals would avoid the disturbance areas along the Park Road, while others would continue to become habituated to human presence. Also, other habitat degradation would continue from effects such as vegetation trampling and development of social trails in areas around transportation nodes.

Under alternative B (and as in alternative A), the impacts from off-bus activities would continue to be limited to areas around the developed transportation nodes along the road, as per the 2006 *Backcountry Management Plan*.

The locations of these wildlife behavior and movement impacts from vehicle use and human activity along the Park Road would be different for various large mammal species. The potential for effects would be greatest for the following species in the following locations:

- **Dall sheep**: Between Igloo Creek and Polychrome Overlook, which is the area of highest sheep concentration along the Park Road corridor
- **caribou**: Between Polychrome Overlook and Wonder Lake, which is the area along the road corridor that typically has the highest caribou concentration during the park visitation season
- **grizzly bear**: Between Igloo Creek and Eielson, which is the area of highest bear concentration along the Park Road corridor
- **gray wolf**: Between Savage River and Sanctuary River, at Igloo Creek, and between the Polychrome Overlook and Highway Pass, which are areas with relatively high wolf concentrations and den activity
- **moose**: Along the eastern segments of the Park Road up to Sanctuary River, which is the largest area of the high moose concentration along the Park Road corridor; between Igloo Creek and Polychrome Overlook; and between Eielson and Wonder Lake

Although there would be similarities with alternative A, alternative B would involve multiple changes to the management of the transportation system on the Park Road (relative to alternative A). As a result, some of the effects on wildlife may be different from those under alternative A.

According to transportation models for alternative B, the total seasonal bus volume on the road could actually increase by 10.2%

should the demand exist (assuming full schedules per day). Similarly, modeling suggests that the daily full schedule bus volume on the road could reach about 97 total buses per day (concessioner and lodge buses), which is comparable to the summer peak day volume of as many as 100 uses under alternative A. However, for concession buses only, the average daily number of buses under alternative A is 77, compared to the average daily number that could be allowed under alternative B (85).

These increases from current vehicle traffic levels that could accompany alternative B have the potential to increase the adverse effects to wildlife in some areas and during certain times of day. For example, both the estimated 10.2% increase in seasonal bus volume and the respective increases in average daily volumes could generate more overall noise and visual disturbances to wildlife along the corridor throughout the season. However, some of these potential increases in wildlife impact would be mitigated or avoided by the use of adaptive management measures, which are discussed later in this analysis section.

Alternative B may realize higher daily bus volumes on the road through the first week of June (compared to an average of 71 total buses realized per day under alternative A). This potential shoulder season traffic increase could adversely affect the seasonal behavior of some wildlife species. For example, this anticipated increase in shoulder season traffic would occur during a period when Dall sheep typically cross the Park Road more frequently and vegetation "green up" hasn't yet occurred in the higher elevations along the road corridor. The springtime traffic increase could cause sheep to move away from the road, and thus, reduce their access to available foraging habitat (Phillips et al. 2010).

The transportation model for alternative B indicates that this alternative would reduce bus volumes on the road during the peak daytime hours and distribute the volume throughout the day, including filling in the mid-day lull and creating longer periods of bus activity during the early- to mid-morning and late afternoon through evening. Although this traffic distribution would benefit wildlife during peak hours, the increased bus activity during mornings and evenings would increase disturbances to wildlife habitat in these shoulder periods. Therefore, this effect would extend the overall daily duration of notable levels of wildlife disturbance and reduce the amount of "downtime" for wildlife to be free from bus and human disturbances.

In addition, alternative B would include enhancements of premium tours that could involve more guided off-bus activities at various transportation nodes along the full length of the corridor. This increase in off-bus human presence and noise could disturb wildlife behavior and movement in the vicinity of the various transportation nodes.

Under alternative B, professional photographers and commercial filming activity would continue to have adverse effects on wildlife and wildlife habitat along the road corridor. However, the photography and filming permit programs would merge under this alternative. A maximum total of two permits per day would be issued. This permitting allowance is a decrease from the allowance in alternative A, which would continue to allow five photo permits per day and additional/separate filming permits. This change would result in a reduction of impacts on wildlife behavior and movement from these uses due to fewer private vehicles and associated photography and filming activities (sometimes for long durations) along the Park Road.

As with alternative A, alternative B would maintain the current road corridor management zones (as per the 1997 *Entrance Area and Road Corridor Design Concept Plan*). This continued management zoning could allow for future growth in vehicle use west of Eielson to Wonder Lake. As a result,

this could result in future increases in disturbances to wildlife behavior and movement in the western portions of the road corridor. With the anticipated tour system under alternative B, the traffic volumes west of Eielson would likely be higher than under alternative A.

The degree of adverse effects from traffic west of Eielson would vary for the large mammal species. This traffic increase would affect caribou and moose the most, since this segment of the Park Road runs through high summer concentration areas for these species. Effects on Dall sheep, grizzly bears, and gray wolves would be more limited because concentrations of these species are relatively low along the Park Road between Eielson and Wonder Lake.

Alternative B includes premium short tours that would primarily terminate and turn around at Teklanika. Thus, under this alternative, the Teklanika transportation hub would likely experience an increase in off-bus visitor activity, which could introduce higher levels of human activity and noise in an area that has a relatively high wolf concentration and den activity (between Teklanika and Igloo Creek), and a relatively high moose concentration.

Under alternative B private vehicles that access the Teklanika River Campground would be required to travel westbound only during designated low-traffic time periods. Although a portion of this reduction in private vehicle use during peak periods might be replaced with an increase in buses on the road, this action would likely reduce overall peak traffic volumes. This could reduce disturbances to wildlife behavior and movement during the times of day when the highest levels of habitat disturbance occur in the area between the park entrance and Teklanika. Conversely, this action would also increase disturbances to wildlife behavior during the periods of relatively low levels of habitat disturbance (i.e., off-peak hours). Again, the area affected would be the area between the park entrance and Teklanika. In addition to introducing adverse impacts to wildlife during off-peak periods, this action could also lead to an increase in nighttime traffic.

However, under alternative B, the Teklanika River Campground would phase into a tents-only camping area within 10 years of plan implementation. When this occurs, visitors would be required to use the transportation system for campground access, which would likely reduce the number of private vehicles on the road and would reduce traffic volumes. This would benefit wildlife and wildlife habitat.

The locations of these adverse and beneficial wildlife impacts from changes in private vehicle use at and to the Teklanika River Campground would vary for the large mammal species. The potential for effects would be greatest for the following species in the following locations:

- **gray wolf**: between Savage River and Sanctuary River, which is an area with relatively high wolf concentrations and den activity
- **moose**: along the eastern segments of the Park Road up to Sanctuary River.
- **Dall sheep, caribou, and grizzly bear**: limited impacts because concentrations of these species are relatively low along the Park Road east of Teklanika.

In addition to the benefit provided by making the Teklanika River Campground a tent-only facility, alternative B also includes several other measures that would benefit wildlife and wildlife habitat along the Park Road corridor.

First, vehicles and visitation would be managed to meet desired conditions of natural resources, such as wildlife, through the use of indicators and standards and adaptive management actions.

The proposed indicators and standards that would affect wildlife and wildlife habitat conditions include

- sheep gap spacing,
- nighttime traffic levels, and
- number of vehicles at wildlife viewing stops.

These standards would help park staff determine if and when vehicle use conditions might be negatively affecting wildlife movement and behavior.

For example, the use of the sheep gap spacing indicator and standard would help ensure that large mammals of the park would be given an adequate amount of time between vehicles to cross the Park Road in an uninhibited, undisturbed manner. The nighttime traffic level indicator and standard would help minimize disturbances to wildlife and wildlife habitat during off-peak hours, which would also help minimize negative effects on their behavior and movement the following morning. And, although the indicator and standard for vehicles at wildlife viewing stops would primarily be intended to minimize crowding for the park visitors along the road, it could also have beneficial effects on wildlife and wildlife habitat because it could help control and minimize the amount of human activity in the proximity of wildlife individuals along the road corridor.

The indicator variables would be monitored and measured through a formalized monitoring program and process. When the minimum standards for each of these indicators are exceeded, an appropriate adaptive management action would be triggered that would help avoid further adverse impact to wildlife and wildlife habitat.

In addition to the monitoring done for the indicator and standards, alternative B would include provisions for additional monitoring of natural resource variables (see appendix C). The park staff would use the Before-After Control Impact (BACI) study design to detect changes in other resource conditions. The BACI study principles would be applied to the park's transportation system by monitoring resource conditions in two similar locations, both before and after an action/disturbance has been introduced at one of the two locations. The resulting changes in resource conditions at each location would then be compared against each other to help discern impact cause-and-effect. The BACI study monitoring would include the following:

- distribution, number and type of wildlife sightings along the road
- timing and location of Dall sheep and grizzly bear road crossings
- grizzly bear and Dall sheep movement rates across or near the Park Road
- distribution of bear inactive periods relative to the road
- probability and timing of Dall sheep road crossings

These proposed BACI monitoring efforts would help inform park staff of possible changes in wildlife habitat conditions soon after the impacts of various transportation actions are measured and realized. However, unlike the formalized indicators and standards, which would be used to formally prompt adaptive management actions when standards are exceeded, the BACI study monitoring results would be used to initiate discussions and analysis by the park and a new advisory committee (see appendix C). The information provided by the BACI study monitoring would help the park staff make transportation management decisions that could minimize impacts on wildlife behavior and wildlife habitat.

Although alternative B is projected to involve a seasonal increase and average daily increases in total bus volumes on the Park Road (assuming a full schedule), adaptive management measures would be used to help prevent the potential adverse effects to wildlife. With indicators, standards, and BACI variables set to monitor wildlife

habitat conditions, it is possible for the increases in vehicle volumes to occur while still limiting adverse effects on wildlife.

While the above-mentioned adaptive management and transportation system adjustments of this alternative would benefit grizzly bears and their habitat, some changes to the male and female distribution of grizzly bear activity along the Park Road corridor may also occur as a result of this alternative. As noted in chapter 3, bear monitoring evidence indicates that a higher level of female grizzly bear activity exists closer to and along the road corridor (relative to male bear activity). Given this dichotomy, one could infer that female bears might be using the vehicle disturbances along the road as a buffer from the male bear threat to bear cubs. Therefore, if vehicle impacts to large mammal movement are reduced by the adaptive management and transportation system changes in alternative B, the possibility for an increase in male bear activity closer to the Park Road also exists. If this male bear distribution shift occurs, some changes could result in female distribution and/or cub mortality.

Under alternative B, NPS staff and their guests would be required to use an employee shuttle system for all personal travel along the Park Road. This action would reduce the overall number of private vehicles on the Park Road and would reduce vehicle volumes during peak traffic periods. In turn, this result would minimize vehicle effects on wildlife behavior and movement.

With the combined transit and self-guiding tour bus system of alternative B functioning on a set schedule, some large mammals could habituate to the consistent patterns of bus traffic on road. This effect would be similar to the bus patterns that would continue under alternative A, and would be a benefit to wildlife behavior and movement.

Overall, despite the measures under alternative B that would help minimize impacts to wildlife, continued and increased vehicle use on the Park Road and associated human activity, including off-bus activities around transportation nodes, would have a long-term, moderate, adverse, and localized impact on wildlife and wildlife habitat along the Park Road corridor. These impacts would occur each year during the visitation season, and would include disturbances to wildlife feeding, mating, caring for young, and/or movement. The effects would result in some individual animals becoming more habituated to humans and changes to localized populations of some species. The alternative would only have minimal effects on regional species populations. However, when compared to alternative A, this alternative would likely reduce adverse impacts on wildlife and wildlife habitat. This reduction would be due to actions such as improving habitat monitoring and the use of adaptive management measures, and the potential for modifications in private vehicle use that would minimize road traffic during peak hours (e.g., park staff vehicles, photographers and filming crews, and visitors to the Teklanika River Campground). However, while the adaptive management measures would likely reduce wildlife impacts during daily peak hours and accommodate an increase in seasonal bus volumes, this alternative would likely increase adverse effects to wildlife during the daily off-peak hours and during the shoulder seasons relative to alternative A.

Cumulative Impacts

Several past, present, and reasonably foreseeable future projects and actions in the vicinity of the Park Road corridor have had and will have notable effects on the wildlife and wildlife habitat in the area. These projects and actions are described and summarized in the alternative A section above.

Collectively, the other past, present, and reasonably foreseeable future projects and actions would have long-term, moderate, and local to regionwide adverse impacts on wildlife and wildlife habitat in the park.

When the effects of alternative B actions are added to the effects of these other past, present, and reasonably foreseeable future actions, there would be a long-term, moderate, adverse, and local to regionwide cumulative impact on wildlife and wildlife habitat. Alternative B would contribute a medium, long-term, adverse increment to this cumulative effect.

Conclusion

Alternative B would have a long-term, moderate, adverse, and local effect on wildlife and wildlife habitat along the Park Road corridor. This effect would primarily result from the continued, and probably increased, number of vehicles (moving or parked) on the Park Road and associated increases in off-bus human activity at transportation nodes. This impact includes likely increase in adverse effects to wildlife during the daily off-peak hours and during the shoulder seasons due to increased traffic during those periods. The effects would involve adverse impacts to wildlife behavior, movement, and stress levels. However, this alternative would also benefit wildlife and wildlife habitat from actions such as adaptive management measures (e.g., use of indicators and standards, BACI studies) and reductions in private vehicle use.

ALTERNATIVE C

Analysis

Under alternative C, vehicle travel and off-bus visitor use along the Park Road would continue. This vehicle traffic and human activity would continue to have a variety of notable adverse effects on wildlife and wildlife habitat along the road corridor. The types of continued impacts and disturbances to wildlife habitat from vehicles and humans would be similar to those described in the alternative A analysis section.

Briefly, individual vehicles and/or queues of multiple vehicles (moving or parked) along the road would continue to adversely affect wildlife behavior, movement, and stress levels. Some individual animals would avoid the disturbance areas along the Park Road, while others would continue to become habituated to human presence. Also, other habitat degradation would continue from effects such as vegetation trampling and the development of social trails in areas around transportation nodes.

Under alternative C (as in alternative A), the impacts from off-bus activities would continue to be limited to areas around the developed transportation nodes along the road, as per the 2006 *Backcountry Management Plan*.

The locations of above-mentioned wildlife behavior and movement impacts from vehicle use and human activity along the Park Road would be different for various large mammal species. The potential for effects would be in the same locations and with the same intensity as listed for alternative B above.

Alternative C would also involve multiple changes to the management of the transportation system on the Park Road (relative to alternative A). As a result, some of the effects on wildlife may be different from those under alternative A.

According to transportation models for alternative C, should the demand exist, the total seasonal bus volume on the road could increase by 8.7% (assuming full schedules per day). The daily full schedule bus volume on the road could reach about 95 total buses per day (concessioner and lodge buses), which is comparable to the summer peak day volume that can be as high as 100 under alternative A. However, for concession buses only, the average daily number of buses under alternative A is 77, compared to the average daily number that could be allowed under alternative C (84).

These increases in vehicle traffic levels that could accompany alternative C have the potential to increase the adverse effects to wildlife in some areas and during certain

times of day. For example, the estimated 8.7% increase in seasonal bus volume and the respective increases in average daily volumes could generate more overall noise and visual disturbances to wildlife along the corridor throughout the season. However, some of these potential increases in wildlife impact would be mitigated or avoided by the use of adaptive management measures, which are discussed later in this analysis section.

Alternative C may realize higher daily bus volumes on the road through the first week of June (compared to an average of 71 total buses realized per day under alternative A). This potential shoulder season traffic increase could adversely affect the seasonal behavior of some wildlife species. For example, this anticipated increase in shoulder season traffic would occur during a period when Dall sheep typically cross the Park Road more frequently and vegetation "green up" hasn't yet occurred in the higher elevations along the road corridor. The springtime traffic increase could cause sheep to move away from the road, and thus, reduce their access to available foraging habitat (Phillips et al. 2010).

The transportation model for alternative C indicates that this alternative would reduce bus volumes on the road during the peak daytime hours and distribute the volume throughout the day, including filling in the mid-day lull and creating longer periods of bus activity during the early- to mid-morning and late afternoon through evening. Although this traffic distribution would benefit wildlife during peak hours, the increased bus activity during mornings and evenings would increase disturbances to wildlife habitat in these shoulder periods. Therefore, this would extend the overall daily duration of notable levels of wildlife disturbance and reduce the amount of "downtime" for wildlife to be free from bus/human disturbances.

Due to the expanded ability of the transit system to pick up hikers under alternative C, visitors would have more confidence in that service and therefore have more freedom to change their travel plans and destinations by getting off and reboarding transit buses along the length of the Park Road. If visitors take advantage of this increased independence and flexibility, an increase in off-bus, unguided, human activity might occur at or around many transportation nodes along the length of the road. If this happens, an increase in dispersed human activity such as day-hiking and associated impacts to wildlife behavior, movement, and stress levels could result (e.g., from off-trail vegetation trampling, increase in noises, dispersion of human activity farther out in the landscape around transportation nodes).

Alternative C would include enhancements of premium tours that could involve more guided off-bus activities at various transportation nodes long the full length of the corridor. This increase in off-bus human presence and noise could disturb wildlife behavior and movement in the vicinity of the various transportation nodes.

Also, under alternative C, professional photographers and commercial filming activity would continue to have adverse effects on wildlife and wildlife habitat along the road corridor. However, the photography and filming permit programs would merge under this alternative. Up to three permits would be made available for the entire Park Road. This permitting allowance is a decrease from alternative A, which would continue to allow up to five photo permits per day and additional separate filming permits. This action would reduce human disturbances to wildlife behavior and movement due to fewer private vehicles and associated photography and filming activities (sometimes for long durations) along the Park Road.

Under alternative C, private vehicles that access the Teklanika River Campground would be required to travel westbound only during designated low-traffic time periods. Although a portion of this reduction in

private vehicle use during peak periods might be replaced with an increase in buses on the road, this action would likely reduce overall peak traffic volumes. This could reduce disturbances to wildlife behavior and movement during the times of day when the highest levels of habitat disturbance occur in the area between the park entrance and Teklanika. Conversely, this action would also increase disturbances to wildlife behavior during the periods of relatively low levels of habitat disturbance (i.e., off-peak hours). In addition to introducing adverse impacts to wildlife during off-peak periods, this action could also lead to an increase in nighttime traffic.

The degree and locations of these wildlife impacts from changes in private vehicle use at and to the Teklanika River Campground would vary for the large mammal species. The potential for effects would be greatest for the following species in the following locations:

- **gray wolf**: between Savage River and Sanctuary River, which is an area with relatively high wolf concentrations and den activity
- **moose**: along the eastern segments of the Park Road up to Sanctuary River.
- **Dall sheep, caribou, and grizzly bear**: effects would be limited because concentrations of these species are relatively low along the Park Road east of Teklanika.

Alternative C includes various measures that would benefit wildlife and wildlife habitat along the Park Road corridor.

First, vehicles and visitation would be managed to meet desired conditions of natural resources, such as wildlife, through the use of indicators and standards and adaptive management actions.
The proposed indicators and standards that would affect wildlife and wildlife habitat conditions include

- sheep gap spacing
- nighttime traffic levels
- number of vehicles at wildlife viewing stops

These standards would help park staff determine if and when vehicle use conditions might be negatively affecting wildlife movement and behavior.

The use of the sheep gap spacing indicator and standard would help ensure that large mammals of the park would be given an adequate amount of time between vehicles to cross the Park Road in an uninhibited, undisturbed manner. The nighttime traffic level indicator and standard would help minimize disturbances to wildlife and wildlife habitat during off-peak hours, which would also help minimize negative effects on their behavior and movement the following morning. And, although the indicator and standard for vehicles at wildlife viewing stops would primarily be intended to minimize crowding for the park visitors, it could also have beneficial effects on wildlife and wildlife habitat because it could help control and minimize the amount of human activity in the proximity of wildlife individuals along the road corridor.

These indicators would be monitored and measured through a formalized monitoring program and process. When the minimum standards for each of these indicators are exceeded, an appropriate adaptive management action would be triggered that would help avoid further adverse impact to wildlife and wildlife habitat. Another possible outcome of managing the vehicle use to these indicators and standards could be a more set traffic pattern on the Park Road, which could also have beneficial effects on wildlife and wildlife habitat.

In addition to the monitoring done for the indicator and standards, alternative C would include provisions for additional monitoring of natural resource variables. Park staff would use the Before-After Control Impact (BACI) study design to detect changes in other resource conditions. The BACI study principles would be applied to the park's

transportation system by monitoring resource conditions in two similar locations, both before and after an action/disturbance has been introduced at one of the two locations. The resulting changes in resource conditions at each location would then be compared against each other to help discern impact cause-and-effect. Alternative C would include BACI study monitoring for the following:

- distribution, number and types of wildlife sightings along the road
- timing and location of Dall sheep and grizzly bear road crossings
- grizzly bear and Dall sheep movement rates across or near the Park Road
- distribution of bear inactive periods relative to the road
- probability and timing of Dall sheep road crossings

These proposed BACI monitoring efforts would help inform park staff of possible changes in wildlife habitat conditions soon after the impacts of various transportation actions are measured and realized. However, unlike the formalized indicators and standards, which would be used to formally prompt adaptive management actions when standards are exceeded, the BACI study monitoring results would be used to initiate discussions and analysis by the park. The information provided by the BACI study monitoring could help the park staff make transportation management decisions that would minimize impacts on wildlife behavior and wildlife habitat.

Although alternative C is projected to involve a seasonal increase and a daily average increase in bus volumes on the Park Road (assuming a full schedule), these adaptive management measures would be used to help prevent the potential resulting adverse effects to wildlife from occurring. With indicators, standards, and BACI variables set to monitor wildlife habitat conditions, it is possible for the increases in vehicle volumes to occur while still limiting adverse effects on wildlife.

While the above-mentioned adaptive management and transportation system adjustments would benefit grizzly bears and their habitat, some changes to the male and female distribution of grizzly bear activity along the Park Road corridor may also occur as a result of this alternative. As noted in chapter 3, bear monitoring evidence indicates that a higher level of female grizzly bear activity exists closer to and along the road corridor (relative to male bear activity). Given this dichotomy, one could infer that female bears might be using the vehicle disturbances along the road as a buffer from the male bear threat to bear cubs. Therefore, if vehicle impacts to large mammal movement are reduced by the adaptive management and transportation system changes in alternative C, the possibility for an increase in male bear activity closer to the Park Road also exists. If this male bear distribution shift occurs, some changes could result in female distribution and/or cub mortality.

With the transit bus system of alternative C functioning on a set schedule, some large mammals could habituate to the consistent patterns of bus traffic on road. This effect would be similar to the bus patterns that would continue under alternative A, and would be a benefit to wildlife behavior and movement.

Unlike alternative A, alternative C includes the creation of a new Wildlife Viewing Subzone 3 between Eielson Visitor Center and Wonder Lake. This new zone would be managed for the lowest traffic volume on the Park Road and not allow notable volume/use growth beyond current condition. As a result, disturbances to wildlife behavior and movement along the road corridor could be minimized more than alternative A due to lower traffic volumes and associated disturbances (e.g., noise, inhibited road crossing, off-bus human activities, and facilities development). And, unlike

alternative A, the new Wildlife Viewing Subzone 3 under alternative C would help ensure future limitations to road use and traffic volumes in this western segment of the Park Road.

The degree of beneficial effects from the new Wildlife Viewing Subzone 3 would vary for the large mammal species. This action would affect caribou and moose the most, since this segment of the Park Road runs through high concentration areas for these species during the summer months. Effects on Dall sheep, grizzly bears, and gray wolves would be more limited because concentrations of these species are relatively low along the Park Road between Eielson and Wonder Lake.

Under alternative C, NPS staff and their guests could continue to use private vehicles. However, this vehicle use on the Park Road would only be allowed during low traffic volume periods. During high volume periods, NPS staff and guests would need to use the transit system. This adjustment of staff vehicle travel times would reduce road traffic during peak hours and reduce vehicle effects on wildlife behavior and movement (except during low traffic periods).

Overall, despite these measures under alternative C that would help minimize impacts to wildlife, continued vehicle use on the Park Road and associated human activity, including off-bus activities around transportation nodes, would have a long-term, moderate, adverse, and localized impact on wildlife and wildlife habitat along the Park Road corridor. These impacts would occur each year during the visitation season, and would result from disturbances to wildlife feeding, mating, caring for young, and movement. The effects would result in some individual animals becoming more habituated to humans and changes to localized populations of some species. The alternative would only have minimal effects on regional species populations. However, when compared to alternative A, this alternative would reduce adverse impacts on wildlife and wildlife habitat from actions such as improving habitat monitoring and protection along the road via the use of adaptive management measures, the establishment of a more protective management zone between Eielson and Wonder Lake, and the potential for modifications in private vehicle use that would minimize road traffic during peak hours (e.g., park staff vehicles, photographers and filming crews, and visitors to the Teklanika River Campground). However, while the adaptive management measures would likely reduce wildlife impacts during daily peak hours and accommodate an increase in seasonal bus volumes, this alternative would likely increase adverse effects to wildlife during the daily off-peak hours and during the shoulder seasons relative to alternative A.

Cumulative Impacts

Several past, present, and reasonably foreseeable future projects and actions in the vicinity of the Park Road corridor have had and will have notable effects on the wildlife and wildlife habitat in the area. These projects and actions are described and summarized in the alternative A section above.

Collectively, the other past, present, and reasonably foreseeable future projects and actions would have long-term, moderate, adverse, and local to regionwide impacts on wildlife and wildlife habitat in the park.

When the likely beneficial and adverse effects of alternative C actions are added to the effects of these other past, present, and reasonably foreseeable future actions, there would be a long-term, moderate, adverse, and local to regionwide cumulative impact on wildlife and wildlife habitat. Alternative C would contribute a medium, long-term, adverse increment to this cumulative effect.

Conclusion

Alternative C would have a long-term, moderate, adverse, and local effect on

wildlife and wildlife habitat along the Park Road corridor. This effect would primarily result from the continued, and likely increased, number of vehicles on the Park Road throughout the season (moving or parked) and associated probably increase of off-bus human activity at transportation nodes. This impact includes likely increase in adverse effects to wildlife during the daily off-peak hours and during the shoulder seasons due to increased traffic during those periods. The effects would involve adverse impacts to wildlife behavior, movement, and stress levels. However, this alternative would also benefit wildlife and wildlife habitat from actions such as adaptive management measures (e.g., indicators and standards, BACI studies), a more protective management zone between Eielson and Wonder Lake, and reductions in private vehicle use.

WILDERNESS

METHODOLOGY AND ASSUMPTIONS

The effects of implementing the various management alternatives on wilderness are analyzed in this section. The analysis is qualitative rather than quantitative because of the conceptual nature of the alternatives. Consequently professional judgment was used to reach reasonable conclusions as to the context, intensity, duration, and type of potential impacts.

Measure

The 1964 Wilderness Act states, "it is hereby declared to be the policy of Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness." One of the central mandates of this act is to preserve wilderness character. Section 2.(a) states that wilderness areas shall be administered "so as to provide for the protection of these areas, the preservation of their wilderness character . . . ." Section 4.(b) states: "Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character."

The Denali Park Road corridor is not designated wilderness land or wilderness-eligible land. However, since designated wilderness lies in close proximity (150 feet from the centerline on either side of the Park Road), activities that occur on and along the Park Road have the potential to affect the wilderness character of the lands that abut the corridor. Thus, this impact topic focuses on the extent to which the actions of the proposed alternatives alter the wilderness character of the adjacent designated wilderness lands.

Wilderness character is not specifically defined in the 1964 Wilderness Act, nor is its meaning discussed in the act's legislative history. However, the Wilderness Act identifies the following qualities that unify wilderness areas regardless of their size, location, or any other feature.

Undeveloped – "an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation . . . ." This refers to areas that are essentially without permanent structures, enhancements, or modern human occupation. To retain its primitive character, a wilderness ideally is managed without the use of motorized equipment or mechanical transport.

Natural – "protected and managed so as to preserve its natural conditions . . . ." This means areas that are largely free from effects of modern civilization. It also refers to maintenance of natural ecological relationships and processes, continued existence of native wildlife and plants in largely natural conditions, and absence of distractions (e.g., large groups of people; mechanization; and evidence of human manipulation, unnatural noises, signs, and other modern artifacts.)

Untrammeled – "an area where the earth and its community of life are untrammeled by man," and "generally appears to have been affected primarily by the forces of nature…" This refers to ecosystems that are unhindered and free from human control or manipulation. In other words, this wilderness quality can be degraded by human actions that control or manipulate components or processes of ecological systems within the wilderness area.

Outstanding Opportunities for Solitude or Unconfined Recreation – "has outstanding

opportunities for solitude or a primitive and unconfined type of recreation . . . .” Solitude means encountering few, if any, people, and experiencing privacy and isolation. Primitive and unconfined recreation refers to freedom to explore with few restrictions, and the ability to be spontaneous. It means self-sufficiency without support facilities or motorized transportation, and experiencing weather, terrain, and other aspects of the natural world with minimal shelter or assistance from devices of modern civilization.

Intensity Definitions

Minor: Effects on opportunities for solitude or a primitive and unconfined wilderness experience would be only slightly beneficial or adverse. Changes due to visible development, use of motorized vehicles, or other factors that alter the undeveloped, natural, and untrammeled qualities of wilderness would affect an isolated portion of the wilderness area (or a wilderness-eligible area). Natural conditions would predominate.

Moderate: Some notable effects on opportunities for solitude or a primitive and unconfined wilderness experience would occur. Changes due to visible development, use of motorized vehicles, or other factors that alter the undeveloped, natural, and untrammeled qualities of wilderness would be evident and affect one or more portions of the wilderness area (or wilderness-eligible areas). Natural conditions would predominate overall, but some changes to wilderness character would occur.

Major: Effects on opportunities for solitude or a primitive and unconfined wilderness experience would be substantial. Changes due to visible development, use of motorized vehicles, or other factors that alter the undeveloped, natural, and untrammeled qualities of wilderness would be extensive and would affect multiple portions of the wilderness area (or wilderness-eligible areas). Natural conditions would be affected in some wilderness areas, and large changes to wilderness character would occur.

ALTERNATIVE A (NO-ACTION ALTERNATIVE)

Analysis

Under alternative A, the transportation system on the Park Road would continue to be managed to maintain the previously set 10,512 vehicles per year maximum and to provide the current offerings of tours and off-bus activities. This continued operation would maintain the average of about 83 total buses per day throughout the visitation season (concessioner and lodge buses). The system volume on the Park Road could be expected to peak at about 91 total buses per day during mid-summer months, but only reach about 71 total buses per day through the first week of June during the spring shoulder season.

Under alternative A, the highest level of bus traffic would continue to occur during the peak hours of the day (late morning through mid-afternoon), with notably lower traffic volumes in the shoulder periods of the day (early to mid-morning and late afternoon through evening).

The implementation of alternative A would continue to have a variety of effects on the wilderness character along the Park Road corridor. Adverse effects would continue to result from individual vehicles, queues of multiple vehicles, off-bus human activity at transportation hubs along the full length of the road, and continued road and facility maintenance.

The four qualities of wilderness character would continue to be affected by the implementation of alternative A in the following ways:

Undeveloped

Under alternative A, the existing road, the bus traffic on it, the existing park facilities at transportation nodes, and the maintenance

activities of these features would continue to be human imprints on the landscape, as seen and heard from the wilderness lands along the road corridor. Given the wide open viewsheds and high sound propagation of the wilderness landscape along the Park Road corridor, the structures, road vehicles, activities, and noises would continue to be observed and heard from wilderness lands in the area. Vegetation trampling and social trails in high use areas would also be noticeable. All of these "imprints of man's work" and signs of human presence would be most noticeable in wilderness areas surrounding the transportation nodes and areas where the Park Road is directly in view. However, at times of heavy traffic volumes and/or road maintenance activities, the imprints would also continue to be very noticeable in several areas along the corridor.

Also, the professional photography permit program would continue to allow five road permits per day for private photography vehicles via a lottery system. The park's commercial filming program would also grant a discretionary number of special use permits (independent of photography permitting). In addition to adding to the Park Road's overall traffic volume, the private vehicles associated with photography and filming would also be parked along the Park Road corridor for lengthy periods of time. This continued level of photography and filming use would continue to be signs of human presence and evidence of developed conditions along the corridor.

Alternative A would also maintain the current management zones as defined by the *1997 Entrance Area and Road Corridor Design Concept Plan*. These management zones could allow some increases in vehicle use and transportation system development between Eielson and Wonder Lake—currently a less developed segment of the road corridor. Future changes in allowable traffic volumes and associated human activity along this segment could have adverse effects on undeveloped condition of wilderness by introducing more noise, human presence, and vehicles in the viewshed.

Natural

Under alternative A, the Park Road infrastructure, vehicle traffic, and human activity around transportation nodes would continue to alter the natural conditions along the corridor, such as natural processes and ecological systems (e.g., wildlife movement, vegetation patterns). Natural processes and conditions such as water quality, surface hydrology regime, and soil horizons and soil erosion would all continue to be affected by the road, vehicle traffic, and human use in the corridor (e.g., at transportation nodes). Other ecological attributes such as vegetation community patterns and wildlife movement/behavior would also continue to be adversely affected by these developments, uses, and noises. Given the interconnectedness of the park's natural ecology, these continuing human-introduced conditions along the Park Road would also continue to degrade the natural conditions of the surrounding wilderness lands. The adverse impact to wildlife habitat is described in the Wildlife Habitat section above.

As noted in the section above, alternative A would also maintain the current management zones as defined by the *1997 Entrance Area and Road Corridor Design Concept Plan*. Future changes in allowable traffic volumes and associated human activity along this segment could have adverse effects on the natural condition of wilderness by introducing more noise and human presence to the natural system. These disturbances could further alter the natural ecology and processes of the area wilderness lands.

Untrammeled

The continued implementation of alternative A and the associated management of the natural landscape along the road corridor and at transportation nodes would

continue to alter the untrammeled quality of some wilderness that is immediately adjacent to the corridor. For example, the control of surface hydrology along the road would also affect downstream hydrology on wilderness lands. Also, the management of vegetation along trails and human access points in vicinity of transportation nodes would continue to impact the "forces of nature" effects on the immediately adjacent wilderness lands. However, since active management of the Park Road, bus system, and transportation node areas do not occur on wilderness lands, other effects of this management would not be considered "trammeling" of wilderness.

Outstanding Opportunities for Solitude or Unconfined Recreation

Alternative A would also continue to have effects on opportunities for solitude and unconfined recreation on wilderness lands along the Park Road corridor. The existing transportation system would continue to bring human presence, activities, noise, and other reminders of society very near backcountry areas of the park. Park visitors would continue to use the transit buses to access backcountry areas. Thus, some higher concentrations of backcountry visitors would continue to be expected at transportation nodes along the road and in wilderness areas that radiate out from the transportation nodes. This distribution of backcountry visitors would continue to have adverse effects on opportunities for solitude in some areas, particularly near the transportation nodes. Off-bus tour activity around transportation nodes such as day hiking would also continue to compound the disturbances to solitude near and in wilderness areas. In addition, the sense of solitude in wilderness for backcountry users would also continue to be adversely affected by the visual intrusion and noises of buses, private vehicles, and NPS maintenance operations along the extent of the Park Road.

Under alternative A, the impacts from off-bus tour activities would continue to be limited to areas around the developed transportation nodes along the road, as per the 2006 *Backcountry Management Plan*.

The continued implementation of the park's photography/filming policies and existing management zones (mentioned above) could also continue to result in adverse effects on the sense of solitude for backcountry users.

Also noted in the sections above, alternative A would maintain the current management zones as defined by the *1997 Entrance Area and Road Corridor Design Concept Plan*. Future changes in allowable traffic volumes and associated human activity along this segment could degrade opportunities for solitude in wilderness by introducing more noise and human presence to the natural system.

To help assess visitor experience and the above four qualities of wilderness character, park staff would continue to conduct random, informal visitor surveys and resource monitoring under alternative A. However, these efforts would not be part of a formalized, quantified adaptive management program. And, the actual act of conducting surveys near wilderness access points could impact the sense of unconfined recreation for wilderness users.

Collectively, with the continuation of the above effects to the four qualities of wilderness character, alternative A would result in a long-term, moderate, adverse, and local effect on wilderness character. All four wilderness qualities of the surrounding wilderness lands along the Park Road corridor would continue to be adversely affected (i.e., opportunities for wilderness solitude, and the undeveloped, natural, untrammeled qualities of wilderness). These adverse effects would primarily relate to the continued visual and noise disturbances to wilderness and the area's ecological system from vehicle use along the Park Road, and from the continued concentrated human activity and imprints at the park's

transportation nodes and along the road itself.

Cumulative Impacts

Several past, present, and reasonably foreseeable future projects and actions in the vicinity of the Park Road corridor and throughout the park have had and will have notable effects on the wilderness character in the area.

Past and current NPS plans established permit systems for wilderness use and adaptive management standards for wilderness experience. For example, the 2006 *Backcountry Management Plan* established standards for visitor experience indicators such as the number of encounters with other parties and the number of encounters with large groups. Managing for these standards help protect opportunities for solitude in wilderness and help limit impact to vegetation and wildlife habitat on wilderness lands (by limiting overcrowding in wilderness areas). Standards for camping density assure that backcountry visitors would have the opportunity to camp out of sight and sound of other visitors. Standards for the number of encounters with evidence of modern human use ensure that in most of the backcountry visitors would continue to encounter few or no signs of modern equipment. As park visitation to the park increases, these standards protect wilderness character and experience by triggering management action to disperse or limit the density of visitors in locations where problems arise.

The use of backcountry unit quotas (via a permitting system), as established by the 1976 *Backcountry Management Plan*, protects wilderness experience in the backcountry of the Old Park by limiting encounters, dispersing visitors and visitor impacts, and insuring that the great majority of visitors could camp out of sight and sound of others. The permit requirement for the Old Park lands does restrict freedom of movement since visitors must camp in the unit for which they have a permit on any given night. However, day users are not similarly restricted.

Scenic air tours also have considerable impact on wilderness in the park. The increase in scenic air tours through the park has resulted in more noise disturbances in wilderness areas. The loud motorized noises generated by these planes further spread signs of modern human uses and disturb natural soundscapes over large geographic areas of wilderness in the park. Overall, given the noise volumes and large areas of sound propagation, noise disturbances from motorized use in the air have substantial adverse effects on wilderness values in the park.

The 2006 *Backcountry Management Plan* established management areas in the park that allow varying levels of natural sound disturbances. Approximately 80% of the park and preserve is within a management zone that allows low levels of natural sound disturbance. About 9% is zoned to allow medium levels of natural sound disturbance, and another 9% is zoned to allow a high level of disturbance. These limits for noise disturbances have beneficial effects on wilderness values in the Old Park, but adverse effects on wilderness in some other areas that are suitable for wilderness designation.

Various past and present NPS plans have directed the development of recreation facilities near or in designated wilderness lands. These developments have adverse effects on wilderness values by bringing more imprints of human development and increased human presence and noises in close proximity to wilderness areas. For example, the park's 2006 *Backcountry Management Plan* guided the development of some new official trails and other recreation facilities in areas immediately adjacent to wilderness lands, including locations such as the Triple Lakes, Savage, Wonder Lake, and the Eielson Visitor Center areas. In addition, the 1997 *Entrance Area and Road Corridor Design Concept Plan*

guided the National Park Service to construct trails that extend into the designated wilderness of the Old Park, and is guiding the development of additional trails. These trails are permanent new structures in the wilderness area, despite being a short distance relative to the overall Wilderness area size.

In past years, the National Park Service has also established seasonal administrative camps in wilderness at the Kahiltna Base Camp and at the 14,000-foot level on Mount McKinley and has generally increased research and administrative activity in the backcountry. These increases in NPS activities include the use of aircraft and other motorized equipment and some temporary and long-term installations of communications and research equipment. This heightened administrative presence and noises, and the resulting adverse impacts to wilderness values, are observable to backcountry visitors, particularly in the vicinity of the administrative camps or repeater sites.

Collectively, the other past, present, and reasonably foreseeable future projects and actions would have long-term, moderate, adverse, and local to regionwide impacts on wilderness in the park. Notably, there has been a substantial increase in airplane use over a large portion of the park wilderness areas, and a gradual increase in communication sites and temporary and permanent research installations located in wilderness.

When the effects of alternative A actions are added to the effects of these other past, present, and reasonably foreseeable future actions, there would be a long-term, moderate, adverse, and local to regionwide cumulative impact on wilderness. Alternative A would contribute a substantial, long-term, adverse increment to this cumulative impact.

Conclusion

Alternative A would result in a long-term, moderate, adverse, and local effect on opportunities for wilderness solitude and the undeveloped, natural, untrammeled qualities of the surrounding wilderness lands along the Park Road. These adverse effects would primarily relate to the continued visual and noise disturbances to wilderness and the area's ecological system from vehicle use along the Park Road, and from the continued concentrated human activity and imprints at and around the park's transportation nodes and road.

ALTERNATIVE B

Analysis

Under alternative B, the Park Road would continue to be used for park visitation and wilderness access, resulting in continuing road maintenance, vehicle traffic, and off-bus human activity at transportation nodes along the length of the road. This vehicle traffic and human activity would continue to have a variety of notable adverse effects on wilderness character along the road corridor similar to the effects described in the alternative A analysis above. In addition to these continuing effects of vehicle and human traffic on the Park Road, some changes to wilderness impacts could be expected.

According to transportation models for alternative B, the total seasonal bus volume on the road could actually increase by 10.2% should the demand exist (assuming full schedules per day). Similarly, modeling suggests that the daily full schedule bus volume on the road could reach about 97 total buses per day (concessioner and lodge buses), which is comparable to the summer peak day volume of 100 buses under alternative A. The alternative B full schedule bus volume (97 buses per day) would also be notably higher than the full season daily average of 83 total buses per day under alternative A. Alternative B would also allow higher daily bus volumes on the road

through the first week of June (compared to an average of 71 total buses realized per day under alternative A).

These increases from current vehicle traffic levels that could accompany alternative B have the potential to increase the adverse effects on wilderness character during certain periods of day and season. For example, both the estimated 10.2% increase in seasonal bus volume and the respective increases in daily volumes could generate more overall noise and visual disturbances to wilderness along the corridor throughout the visitation season.

More specifically, alternative B would affect the four qualities of wilderness character in the followings ways:

Undeveloped

Under alternative B, the effects on the undeveloped quality of the adjacent wilderness lands would be similar to those described under alternative A in many regards. However, the anticipated increases in vehicle volumes on the road and the associated increases in off-bus human activity around transportation nodes would increase the degree of the disturbances to the undeveloped quality of adjacent wilderness lands. For example, the estimated 10.2% increase in seasonal bus volume would generate more overall noise and visual disturbances, which would make "imprints of man's work" more evident at or near the interface with the wilderness lands, and thus increase the adverse effect on the undeveloped quality of the wilderness.

In addition, the transportation model for alternative B indicates that this alternative would reduce bus volumes on the road during the peak daytime hours and distribute the volume throughout the day, including filling in the mid-day lull and creating longer periods of bus activity during the early- to mid-morning and late afternoon through evening. Although this traffic distribution would benefit wilderness values during peak hours, the increased bus noises and visual disturbances during mornings and evenings would increase adverse effects to the undeveloped quality of wilderness lands during these shoulder periods. Similarly, alternative B also would allow the potential for shoulder season traffic increases (e.g., through the first week of June), which would adversely affect the undeveloped quality of wilderness character during these periods.

Under alternative B, activity and traffic associated with professional photographers and commercial filming would continue to have adverse effects on wilderness character along the road corridor (e.g, from human disturbances, parked vehicles). However, the photography and filming permit programs would merge under this alternative. A maximum total of two permits per day would be issued. This permitting allowance is a decrease from alternative A. This change would result in a reduction of impacts on the undeveloped quality of wilderness from these uses due to less private vehicles and associated photography and filming activities (sometimes for long durations) along the Park Road. For example, decreased impacts to natural viewshed as seen from wilderness lands could be expected.

Alternative B also includes provisions for separating the premium bus tours into short and long tours. While the long tours would continue to transportation nodes much farther west along the road corridor, the short tours would primarily terminate and turn around at Teklanika. Thus, under this alternative, the Teklanika transportation hub would likely experience an increase in off-bus visitor activity, which could introduce higher levels of human presence and noises in close proximity to undeveloped wilderness.

Also, alternative B would include enhancements on premium tours that could involve more guided off-bus activities at various transportation nodes long the full length of the corridor. This increase in off-bus human presence and noise could alter

undeveloped wilderness qualities in areas around the transportation nodes.

As with alternative A, alternative B would maintain the current road corridor management zones (as per the 1997 *Entrance Area and Road Corridor Design Concept Plan*). These management zones could allow future increases in vehicle use and human presence, and respective impacts to wilderness, between Eielson and Wonder Lake (as described under alternative A).

Under alternative B, private vehicles that access the Teklanika River Campground would be required to travel westbound only during designated low-traffic time periods. Although a portion of this reduction in private vehicle use during peak periods might be replaced with an increase in buses on the road, this action would likely reduce overall peak traffic volumes. This would reduce the visual intrusions and noises caused by peak traffic volumes, and thus could reduce adverse effects on the undeveloped quality of immediately adjacent wilderness lands. Conversely, this action would also increase disturbances to wilderness during the periods of relatively low levels of noise and visual disturbances (i.e., off-peak hours). In addition to introducing more adverse impacts during off-peak periods, this action could also lead to an increase in nighttime traffic. Thus, the adaptive management efforts to control nighttime traffic levels may also be affected by this action at Teklanika River Campground.

Under alternative B, the Teklanika River Campground would phase into a tent-only camping area within 10 years of plan implementation. When this occurs, visitors would be required to use the transportation system for campground access, which would reduce the number of private vehicles on the road and would reduce traffic volumes. This traffic and private vehicle reduction would minimize impacts to undeveloped qualities of wilderness along the Park Road east of Teklanika. In addition, the elimination of motorized uses in the campground (e.g., idling engines, generators) would reduce noises and other human-caused disturbances to undeveloped wilderness areas.

Under alternative B, NPS staff and their guests would be required to use an employee shuttle system for all personal travel along the Park Road. This action would reduce the overall number of private vehicles on the Park Road and would reduce vehicle volumes during peak traffic periods. In turn, this effect would minimize vehicle effects on wilderness character.

Also, under alternative B, vehicles and visitation would be managed in a way that would help meet the desired conditions of undeveloped wilderness quality through the use of indicators and standards and adaptive management actions. The proposed standards for nighttime traffic levels, sheep gap spacing, and the number of vehicles at wildlife viewing stops would help determine if vehicle use conditions might be negatively affecting wilderness character in wilderness areas along the road corridor. For example, although the indicator and standard for vehicles at wildlife viewing stops would be intended primarily to minimize crowding for the park visitors along the road, it could also benefit the undeveloped wilderness quality because it could help control and minimize the amount of human activity and unnatural conditions (e.g., vehicles) in the viewshed as seen and heard from the adjacent wilderness areas.

The preservation of these natural and human values directly supports wilderness character. Under alternative B, these indicator variables would be monitored and measured through a formalized monitoring program and process. When the minimum standards for each of these indicators are exceeded, an appropriate adaptive management action would be triggered to avoid further adverse impact to wilderness character along the Park Road corridor.

Natural

Under alternative B, the effects on the natural quality of the adjacent wilderness lands would be quite similar to those described under alternative A. However, the estimated increases in vehicle volumes on the road and the associated increases in off-bus human activity around transportation nodes would increase the degree of the disturbances to the natural conditions and ecology of adjacent wilderness lands. For example, the estimated 10.2% increase in seasonal bus volume would generate more overall noise and visual disturbances, which could disturb wildlife behavior and movement (as described in the Wildlife Habitat section).

The natural quality and ecology of adjacent wilderness lands would also be affected by other actions and results of implementing alternative B. Many of these changes are described in the analysis of the "undeveloped" wilderness quality above. These actions and effects of alternative B include

- reduction of bus volumes on the road during the peak daytime hours and distribution of the volume throughout the day, including filling in the mid-day lull and creating longer periods of bus activity during the early- to mid-morning and late afternoon through evening;
- reduction in activity and traffic involving professional photographers and commercial filming ;
- separation of the premium bus tours into short and long tours, with the short tours terminating at Teklanika (generating an increase in off-bus human activity here);
- enhancements on premium tours that could involve more guided off-bus activities at various transportation nodes long the full length of the corridor;
- continuation of the current road corridor management zones (as per the 1997 *Entrance Area and Road Corridor Design Concept Plan*), which could allow future increased traffic/activity between Eielson and Wonder Lake;
- requirement that private vehicles that access the Teklanika River Campground travel westbound only during designated low-traffic time periods;
- phasing of the Teklanika River Campground into a tents-only camping area within 10 years of plan implementation; and
- requirement for NPS staff and their guests to use an employee shuttle system for all personal travel along the Park Road;

All of the above bulleted components of alternative B would affect the natural quality and ecology of the wilderness lands adjacent to the road corridor. The resulting increases or decreases in vehicle traffic or off-bus human activity that result from these components of alternative B would primarily affect wildlife behavior and movement (due to increases or decreases in disturbances from human activity or noise). These effects are noted in more detail in the Wildlife Habitat section above.

Also, under alternative B, vehicles and visitation would be managed in a way that would help meet the desired conditions of wilderness character through the use of indicators and standards and adaptive management actions. For example, the proposed standards for nighttime traffic levels, sheep gap spacing, and the number of vehicles at wildlife viewing stops would help determine if vehicle use conditions might be negatively affecting the natural quality and ecology of wilderness areas along the road corridor.

The use of the sheep gap spacing indicator and standard would help ensure that large mammals of the park would be given an adequate amount of time between passing

vehicles to cross the Park Road in an unobstructed, undisturbed manner, and thus maintain a more natural ecological system. And, although the indicator and standard for vehicles at wildlife viewing stops would primarily be intended to minimize crowding for the park visitors along the road, it could also benefit the natural quality of wilderness character by helping to control and minimize the amount of human activity that could disturb nearby wildlife.

The preservation of all of these natural and human values directly support wilderness character. Under alternative B, these indicator variables would be monitored and measured through a formalized monitoring program and process. When the minimum standards for each of these indicators are exceeded, an appropriate adaptive management action would be triggered to avoid further adverse impact to wilderness character along the Park Road corridor.

In addition to the monitoring done for the indicator and standards, alternative B would include provisions for additional monitoring of natural resource variables. Under alternative B, the park staff would use the BACI study design to detect changes in other resource conditions, as discussed in the section on impacts to wildlife.

Given the inherent connections between wilderness values and natural systems, the BACI study monitoring would help staff assess wilderness value conditions to make sure that natural processes and ecological connections are maintained. The BACI study monitoring results would be used to help the park staff make transportation management decisions that would minimize impacts on wildlife and their contribution to the natural quality of wilderness character.

Untrammeled

The implementation of alternative B and the associated management of the natural landscape along the road corridor and at transportation nodes would alter the untrammeled quality of some wilderness that is immediately adjacent to the corridor. The effects would be very similar to those described under alternative A.

Outstanding Opportunities for Solitude or Unconfined Recreation

Under alternative B, the effects on the opportunities for solitude or unconfined recreation on adjacent wilderness lands would be similar to those described under alternative A. However, the anticipated overall increases in vehicle volumes on the road and the associated increases in off-bus human activity around transportation nodes would increase the degree of the disturbances to the opportunities for solitude quality of adjacent wilderness lands. For example, the estimated 10.2% increase in seasonal bus volume would generate more overall noise and visual disturbances, which would make nearby human presence more evident to wilderness users. In addition, the estimated increase in off-bus activity at or radiating from transportation nodes would diminish feelings of primitive isolation, privacy, and solitude. These increases in human and bus traffic would have adverse effects on the opportunities for solitude quality of the wilderness character.

Opportunities for solitude would also be affected by other actions and results of implementing alternative B. Many of these changes are described in the analysis of the "undeveloped" wilderness quality above. These actions and effects of alternative B include

- reduction of bus volumes on the road during the peak daytime hours and distribution of the volume throughout the day, including filling in the mid-day lull and creating longer periods of bus activity during the early- to mid-

morning and late afternoon through evening

- reduction in activity and traffic involving professional photographers and commercial filming
- separation of the premium bus tours into short and long tours, with the short tours terminating at Teklanika (generating an increase in off-bus human activity at Teklanika)
- enhancements on premium tours that could involve more guided off-bus activities at various transportation nodes long the full length of the corridor
- continuation of the current road corridor management zones (as per the 1997 Entrance Area and Road Corridor Design Concept Plan), which could allow future increased traffic and off-bus human activity between Eielson and Wonder Lake
- requirement that private vehicles that access the Teklanika River Campground travel westbound only during designated low-traffic time periods
- phasing of the Teklanika River Campground into a tents-only camping area within 10 years of plan implementation
- requirement for NPS staff and their guests to use an employee shuttle system for all personal travel along the Park Road

All of the above bulleted components of alternative B would affect the opportunities for solitude or unconfined recreation on adjacent wilderness lands. The anticipated increases or decreases in bus volume or off-bus human activity that result from these components of alternative B would primarily lead to increases or decreases in disturbances and human encounters for those seeking solitude, isolation, and privacy in wilderness.

Also, under alternative B, vehicles and visitation would be managed in a way that would help meet the desired conditions of wilderness character through the use of indicators and standards and adaptive management actions. The proposed standards for nighttime traffic levels, sheep gap spacing, and the number of vehicles at wildlife viewing stops would help determine if vehicle use conditions might be negatively affecting wilderness character in wilderness areas along the road corridor. For example, the nighttime traffic level indicator and standard would help minimize impacts to wilderness character by controlling road disturbances during times when expectations for solitude and natural quiet are highest for the visitor.

Under alternative B, these indicator variables would be monitored and measured through a formalized monitoring program and process. When the minimum standards for each of these indicators are exceeded, an appropriate adaptive management action would be triggered to avoid further adverse impact to wilderness character along the Park Road corridor.

Overall, due to the above effects to the four qualities of wilderness character, alternative B would have a long-term, moderate, adverse, and local effect on wilderness character. All four wilderness qualities of the surrounding wilderness lands along the Park Road corridor would be adversely affected in some way (i.e., opportunities for wilderness solitude, and the undeveloped, natural, untrammeled qualities of wilderness). These adverse effects would primarily relate to the continued (and occasionally increased) visual and noise disturbances to wilderness and the area's ecological system from vehicle use along the road, unnatural conditions, and concentrated human activity. When compared to alternative A, this alternative could worsen the disturbances opportunities for solitude and undeveloped, natural, and untrammeled wilderness conditions due to possible increases in bus traffic and

increased off-bus activity at transportation nodes. However, alternative B would also provide some benefits to wilderness character, such as: improving habitat monitoring and protection along the road via the use of adaptive management measures such as indicators and standards and the BACI study and some reductions in private vehicle use that would help minimize traffic noise and visual disturbances.

Cumulative Impacts

Several past, present, and reasonably foreseeable future projects and actions in the vicinity of the Park Road corridor have had and will have notable effects on wilderness values in the area. These projects and actions are described and summarized in the alternative A section above.

Collectively, the other past, present, and reasonably foreseeable future projects and actions would have long-term, moderate, adverse, and local to regionwide impacts on wilderness in the park.

When the effects of alternative B actions are added to the effects of these other past, present, and reasonably foreseeable future actions, there would be a long-term, moderate, adverse, and local to regionwide cumulative impact on wilderness. Alternative B would contribute a substantial, long-term, adverse increment to this cumulative effect on wilderness.

Conclusion

Alternative B would result in a long-term, moderate, adverse, and local effect on opportunities for solitude and the undeveloped, natural, untrammeled qualities of the surrounding wilderness lands along the Park Road. These adverse effects would primarily relate to the continued (and occasionally increased) visual and noise disturbances to wilderness and the area's ecological system from vehicle use along the road, unnatural conditions, and concentrated human activity. When compared to alternative A, this alternative could worsen the disturbances to solitude and natural conditions due to possible increases in bus traffic and increased off-bus activity. However, alternative B would also improve the preservation of wilderness character relative to alternative A from actions such as adaptive management measures and some reductions in private vehicle use.

ALTERNATIVE C

Analysis

Alternative C would also involve multiple changes to the management of the transportation system on the Park Road (relative to alternative A). According to transportation models for alternative C, should the demand exist, the total seasonal bus volume on the road could increase by 8.7% (assuming full schedules per day). The daily full schedule bus volume on the road could reach about 95 total buses per day (concessioner and lodge buses), which is comparable to the summer peak day volume of 100 buses under alternative A. However, the alternative C full schedule bus volume (89 buses per day) would be higher than the full season daily average of 83 total buses per day under alternative A. Alternative C would also allow higher daily bus volumes on the road through the first week of June (compared to an average of 71 total buses realized per day under alternative A).

Alternative C would involve multiple changes to the management of the transportation system on the Park Road (relative to alternative A). According to transportation models for alternative C, should the demand exist, the total seasonal bus volume on the road could increase by 8.7% (assuming full schedules per day). The daily full schedule bus volume on the road could reach about 95 total buses per day (concessioner and lodge buses), which is comparable to the summer peak day volume of 100 buses under alternative A. However, the alternative C full schedule bus volume (89 buses per day) would be higher than the

full season daily average of 83 total buses per day under alternative A. Alternative C would also allow higher daily bus volumes on the road through the first week of June (compared to an average of 71 total buses realized per day under alternative A).

These increases in vehicle traffic levels that could accompany alternative C have the potential to increase the adverse effects to wilderness character during certain periods of day and season. For example, the estimated 8.7% increase in seasonal bus volume and the respective increases in average daily volumes could generate more overall noise and visual disturbances to wilderness along the corridor throughout the season.

More specifically, alternative C would affect the four qualities of wilderness character in the followings ways:

Undeveloped

Under alternative C, the effects on the undeveloped quality of the adjacent wilderness lands would be quite similar to those described under alternative A. However, the anticipated increases in vehicle volumes on the road and the associated increases in off-bus human activity around transportation nodes would increase the degree of the disturbances to the undeveloped quality of adjacent wilderness lands. For example, the estimated 8.7% increase in seasonal bus volume would generate more overall noise and visual disturbances, which would make "imprints of man's work" more evident at or near the interface with the wilderness lands, and thus increase the adverse effect on the undeveloped quality of the wilderness.

In addition, the transportation model for alternative C indicates that this alternative would reduce bus volumes on the road during the peak daytime hours and distribute the volume throughout the day, including filling in the mid-day lull and creating longer periods of bus activity during the early- to mid-morning and late afternoon through evening. Although this traffic distribution would benefit wilderness values during peak hours, the increased bus noises and visual disturbances during mornings and evenings would increase adverse effects to the undeveloped quality of wilderness lands during these shoulder periods. Similarly, alternative C also would allow the potential for shoulder season traffic increases (e.g., through the first week of June), which would adversely affect the undeveloped quality of wilderness character during these periods.

Under alternative C, activity and traffic associated with professional photographers and commercial filming would continue to have adverse effects on wilderness along the road corridor. The photography and filming permit programs would merge under this alternative and up to three permits would be made available for the Park Road on any one day. This permit availability is a decrease from alternative A, which would continue to allow five photo permits per day and additional separate filming permits. This change would result in a reduction of impacts on the undeveloped quality of wilderness from these uses due to less private vehicles and associated photography and filming activities (sometimes for long durations) along the Park Road. For example, decreased impacts to natural viewshed as seen from wilderness lands could be expected.

Alternative C would include enhancements on premium tours that could involve more guided off-bus activities at various transportation nodes long the full length of the corridor. This increase in off-bus human presence and noise could alter undeveloped wilderness qualities in areas around the transportation nodes.

Also, under alternative C, a new Wildlife Viewing Subzone 3 would be added (between Eielson Visitor Center and Wonder Lake). This new zone would be managed for the lowest traffic volume on the Park Road and notable volume/use growth beyond current conditions would not be

allowed. The undeveloped quality of wilderness character in this segment would be preserved more than under alternative A because this new zone would help ensure low future traffic volumes in this area. Natural sounds, a wild and remote experience, a contemplative setting, and natural viewsheds (i.e., without traffic in view) would be better preserved in the long-term under this alternative.

Under alternative C, private vehicles that access the Teklanika River Campground would be required to travel westbound only during designated low-traffic time periods. Although a portion of this reduction in private vehicle use during peak periods might be replaced with an increase in buses on the road, this action would likely reduce overall peak traffic volumes. This would reduce the visual intrusions and noises caused by peak traffic volumes, and thus could reduce adverse effects on the undeveloped quality of immediately adjacent wilderness lands. Conversely, this action would also increase disturbances to wilderness during the periods of relatively low levels of noise and visual disturbances (i.e., off-peak hours). In addition to introducing more adverse impacts during off-peak periods, this action could also lead to an increase in nighttime traffic. Thus, the adaptive management efforts to control nighttime traffic levels may also be affected by this action at Teklanika River Campground.

Due to the expanded ability of the transit system to pick up hikers under alternative C, visitors would have more confidence in that service and therefore have more freedom to change their travel plans and destinations by getting off and reboarding transit buses along the length of the Park Road. If visitors take advantage of this increased independence and flexibility, an increase in off-bus, unguided, human activity could be expected at or around many transportation nodes along the length of the road. If this occurs, an increase in dispersed human activity and associated impacts to wilderness qualities could occur (e.g., increases in noises and activity around transportation nodes, etc.).

Under alternative C, NPS staff and their guests could continue to use private vehicles on the Park Road. However, this vehicle use would only be allowed during low traffic volume periods. During high volume periods on the Park Road, NPS staff and guests would need to use the transit system. As with the changes to Teklanika River Campground access and professional photographer access this adjustment of staff vehicle travel times and vehicle use would reduce road traffic during peak hours and reduce vehicle effects on the undeveloped quality of wilderness. However, this action would also increase disturbances to wilderness character during the periods of relatively low levels of noise and visual disturbances (i.e., off-peak hours). In addition to introducing more adverse impacts during off-peak periods, this action could also lead to an increase in nighttime traffic.

Also, under alternative C, vehicles and visitation would be managed in a way that would help meet the desired conditions of undeveloped wilderness quality through the use of indicators and standards and adaptive management actions. The proposed standards for nighttime traffic levels, sheep gap spacing, and the number of vehicles at wildlife viewing stops would help determine if vehicle use conditions might be negatively affecting wilderness character in wilderness areas along the road corridor. For example, although the indicator and standard for vehicles at wildlife viewing stops would primarily be intended to minimize crowding for the park visitors along the road, it could also benefit the undeveloped wilderness quality because it could help control and minimize the amount of human activity and unnatural conditions (e.g., vehicles) in the viewshed as seen and heard from the adjacent wilderness areas.

The preservation of these natural and human values directly supports wilderness

character. Under alternative C, these indicator variables would be monitored and measured through a formalized monitoring program and process. When the minimum standards for each of these indicators are exceeded, an appropriate adaptive management action would be triggered to avoid further adverse impact to wilderness character along the Park Road corridor.

Natural

Under alternative C, the effects on the natural quality of the adjacent wilderness lands would be quite similar to those described under alternative A. However, the estimated increases in vehicle volumes on the road and the associated increases in off-bus human activity around transportation nodes would increase the degree of the disturbances to the natural conditions and ecology of adjacent wilderness lands. For example, the estimated 8.7% increase in seasonal bus volume would generate more overall noise and visual disturbances, which could disturb wildlife behavior and movement (as described in the Wildlife Habitat section).

The natural quality and ecology of adjacent wilderness lands would also be affected by other actions and results of implementing alternative C. Most of these changes are described in the analysis of the "undeveloped" wilderness quality above. These actions and effects of alternative C include

- reduction of bus volumes on the road during the peak daytime hours and distribution of the volume throughout the day, including filling in the mid-day lull and creating longer periods of bus activity during the early- to mid-morning and late afternoon through evening
- reduction in activity and traffic involving professional photographers and commercial filming
- enhancements on premium tours that could involve more guided off-bus activities at various transportation nodes long the full length of the corridor
- creation of a new Wildlife Viewing Subzone 3, between Eielson Visitor Center and Wonder Lake, that would be managed for the lowest traffic volume
- requirement that private vehicles that access the Teklanika River Campground travel westbound only during designated low-traffic time periods
- expanded ability of the transit system to pick up hikers, resulting in increased independence and flexibility and an increase in off-bus, unguided, human activity at or around many transportation nodes
- requirement that NPS staff and their guests only use private vehicles on the Park Road during low traffic volume periods (thus, reduced vehicle volumes during daytime peaks and increased vehicle volumes in off-peak periods)

All of the above bulleted components of alternative C would affect the natural quality and ecology of the wilderness lands adjacent to the road corridor. The resulting increases or decreases in vehicle traffic or off-bus human activity that result from these components of alternative C would primarily affect wildlife behavior and movement (due to increases or decreases in disturbances from human activity or noise). These effects are noted in more detail in the Wildlife Habitat section above.

Also, under alternative C, vehicles and visitation would be managed in a way that would help meet the desired conditions of wilderness character through the use of indicators and standards and adaptive management actions. For example, the proposed standards for nighttime traffic levels, sheep gap spacing, and the number of vehicles at wildlife viewing stops would help determine if vehicle use conditions might be negatively affecting the natural quality and

ecology of wilderness areas along the road corridor.

The use of the sheep gap spacing indicator and standard would help ensure that large mammals of the park would be given an adequate amount of time between passing vehicles to cross the Park Road in an unobstructed, undisturbed manner, and thus maintain a more natural ecological system. And, although the indicator and standard for vehicles at wildlife viewing stops would primarily be intended to minimize crowding for the park visitors along the road, it could also benefit the natural quality of wilderness character by helping to control and minimize the amount of human activity that could disturb nearby wildlife.

The preservation of all of these natural and human values directly supports wilderness character. Under alternative C, these indicator variables would be monitored and measured through a formalized monitoring program and process. When the minimum standards for each of these indicators are exceeded, an appropriate adaptive management action would be triggered to avoid further adverse impact to wilderness character along the Park Road corridor.

In addition to the monitoring done for the indicator and standards, alternative C would include provisions for additional monitoring of natural resource variables. Under alternative C, the park staff would use the BACI study design to detect changes in other resource conditions, as discussed in the section on impacts to wildlife.

Given the inherent connections between wilderness values and natural systems, the BACI study monitoring would help staff assess wilderness value conditions to make sure that natural processes and ecological connections are maintained. The BACI study monitoring results would be used to help the park staff make transportation management decisions that would minimize impacts on wildlife and their contribution to the natural quality of wilderness character.

Untrammeled

The implementation of alternative C and the associated management of the natural landscape along the road corridor and at transportation nodes would alter the untrammeled quality of some wilderness that is immediately adjacent to the corridor. The effects would be very similar to those described under alternative A.

Outstanding Opportunities for Solitude or Unconfined Recreation

Under alternative C, the effects on the opportunities for solitude or unconfined recreation on adjacent wilderness lands would be similar to those described under alternative A. However, the anticipated overall increases in vehicle volumes on the road and the associated increases in off-bus human activity around transportation nodes would increase the degree of the disturbances to the opportunities for solitude quality of adjacent wilderness lands. For example, the estimated 9.3% increase in seasonal bus volume would generate more overall noise and visual disturbances, which would make nearby human presence more evident to wilderness users. In addition, the estimated increase in off-bus activity at or radiating from transportation nodes would diminish feelings of primitive isolation, privacy, and solitude. These increases in human and bus traffic would have adverse effects on the opportunities for solitude quality of the wilderness character.

Opportunities for solitude would also be affected by other actions and results of implementing alternative C. Many of these changes are described in the analysis of the "undeveloped" wilderness quality above. These actions and effects of alternative C include

- reduction of bus volumes on the road during the peak daytime hours and distribution of the volume throughout the day, including filling in the mid-day lull and creating longer periods of bus activity during the early- to mid-

morning and late afternoon through evening

- reduction in activity and traffic involving professional photographers and commercial filming
- enhancements on premium tours that could involve more guided off-bus activities at various transportation nodes long the full length of the corridor
- creation of a new Wildlife Viewing Subzone 3, between Eielson Visitor Center and Wonder Lake, that would be managed for the lowest traffic volume
- requirement that private vehicles that access the Teklanika River Campground travel westbound only during designated low-traffic time periods
- expanded ability of the transit system to pick up hikers, resulting in increased independence and flexibility and an increase in off-bus, unguided, human activity at or around many transportation nodes
- requirement that NPS staff and their guests only use private vehicles on the Park Road during low traffic volume periods (thus, reduced vehicle volumes during daytime peaks and increased vehicle volumes in off-peak periods)

All of the above bulleted components of alternative C would affect the opportunities for solitude or unconfined recreation on adjacent wilderness lands. The anticipated increases or decreases in bus volume or off-bus human activity that result from these components of alternative C would primarily lead to increases or decreases in disturbances and human encounters for those seeking solitude, isolation, and privacy in wilderness.

Also, under alternative C, vehicles and visitation would be managed in a way that would help meet the desired conditions of wilderness character through the use of indicators and standards and adaptive management actions. The proposed standards for nighttime traffic levels, sheep gap spacing, and the number of vehicles at wildlife viewing stops would help determine if vehicle use conditions might be negatively affecting wilderness character in wilderness areas along the road corridor. For example, the nighttime traffic level indicator and standard would help minimize impacts to wilderness character by controlling road disturbances during times when expectations for solitude and natural quiet are highest for the visitor.

Under alternative C, these indicator variables would be monitored and measured through a formalized monitoring program and process. When the minimum standards for each of these indicators are exceeded, an appropriate adaptive management action would be triggered to avoid further adverse impact to wilderness character along the Park Road corridor.

Overall, due to the above effects to the four qualities of wilderness character, alternative C would have a long-term, moderate, adverse, and local effect on wilderness character. All four wilderness qualities of the surrounding wilderness lands along the Park Road corridor would be adversely affected (i.e., opportunities for wilderness solitude, and the undeveloped, natural, untrammeled qualities of wilderness). These adverse effects would primarily relate to the continued (and occasionally increased) visual and noise disturbances to wilderness and the area's ecological system from vehicle use along the road, unnatural conditions, and concentrated human activity. When compared to alternative A, this alternative could worsen the disturbances opportunities for solitude and undeveloped, natural, and untrammeled wilderness conditions due to possible increases in bus traffic and increased off-bus activity at transportation nodes. However, alternative C would also provide some benefits to wilderness character, such as improving habitat

monitoring and protection along the road via the use of adaptive management measures such as indicators and standards and the BACI study, the establishment of a more protective management zone between Eielson and Wonder Lake, and reductions in private vehicle use that would help minimize traffic noise and visual disturbances.

Cumulative Impacts

Several past, present, and reasonably foreseeable future projects and actions in the vicinity of the Park Road corridor have had and will have notable effects on wilderness lands in the area. These projects and actions are described and summarized in the alternative A section on wilderness above.

Collectively, the other past, present, and reasonably foreseeable future projects and actions would have long-term, moderate, adverse, and local to regionwide impacts on wilderness in the park.

When the effects of alternative C actions are added to the effects of these other past, present, and reasonably foreseeable future actions, there would be a long-term, moderate, adverse, and local to regionwide cumulative impact on wilderness.

Alternative C would contribute a substantial long-term, adverse increment to this cumulative effect on wilderness.

Conclusion

Alternative C would result in a long-term, moderate, adverse, and local effect on opportunities for solitude and the undeveloped, natural, untrammeled qualities of the surrounding wilderness lands along the Park Road. These adverse effects would primarily relate to the continued visual and noise disturbances to wilderness and the area's ecological system from vehicle use along the road, unnatural conditions, and concentrated human activity. When compared to alternative A, this alternative could worsen the disturbances to solitude and natural conditions due to possible increases in bus traffic and increased off-bus activity. However, alternative C would also improve the preservation of wilderness character relative to alternative A due to actions such as adaptive management measures, the establishment of a more protective management zone between Eielson and Wonder Lake, and reductions in private vehicle use.

PARK MANAGEMENT AND OPERATIONS

METHODOLOGY AND ASSUMPTIONS

The effects of implementing the alternatives on national park and preserve staffing, facilities, and operations (including concessions) were evaluated. The analysis was conducted in terms of how NPS operations might vary under the different management alternatives. The analysis is qualitative rather than quantitative because of the conceptual nature of the alternatives. Consequently professional judgment was used to reach reasonable conclusions as to the context, intensity, duration, and type of potential impacts.

Measure

The ability to conduct emergency response, law enforcement, interpretation, routine maintenance, natural and cultural resources management, commercial services administration, and other duties and responsibilities with Denali National Park and Preserve.

Intensity Definitions

Minor: Effects on park management and operations would be slight, with little change in the park's ability to provide emergency response, law enforcement, interpretation, routine maintenance, natural and cultural resources management, commercial services administration, inholder access administration, and other duties and responsibilities in a cost effective manner.

Moderate: Effects on park management and operations would have measurable consequences for the park's ability to provide emergency response, law enforcement, interpretation, routine maintenance, natural and cultural resources management, commercial services administration, inholder access administration, and other duties and responsibilities in a cost effective manner.

Major: Effects on park management and operations would have considerable consequences for the park's ability to provide emergency response, law enforcement, interpretation, routine maintenance, natural and cultural resources management, commercial services administration, inholder access administration, and other duties and responsibilities in a cost effective manner.

ALTERNATIVE A (NO-ACTION ALTERNATIVE)

Analysis

Under this alternative vehicle use on the restricted section of the Park Road would continue to be managed to maintain the 10,512 seasonal limit that was set in the 1986 general management plan and then formalized in regulations in 2000. Management zones along the Park Road would remain as described in the 1997 *Entrance Area and Road Corridor Development Concept Plan.* Road maintenance requirements would not change, and park divisions would continue to operate in their current capacities. This alternative would not require changes in staffing, infrastructure, or budget.

However, the 1,754 permits allocated for NPS operations might not always be adequate for park management, causing delays or a lack of flexibility for the staff to navigate in the park. This could result in long-term, minor, adverse impacts to park management and operations along the Park Road.

Cumulative Impacts

Past planning documents such as the 1983 *Development Concept Plan*, its addendum, the 1986 *General Management Plan*, and the 1997 *Entrance Area and Road Corridor*

Development Concept Plan proposed upgrades to or replacement of park facilities, collocating facilities near the hotel, new construction, changes to the entrance, improvements to the circulation system (including the shuttle system and capping traffic levels), and improvements to park operation procedures. Implementing these proposals improved the way the park provided for visitor services, resource protection, maintenance, and park administration. Similarly, contracting out the shuttle system in the mid-1990s, constructing new visitor facilities in the park's entrance area, developing rest stops, maintaining the road, developing new trails, and adding to visitor services improved and added to the park's infrastructure. These actions resulted in parkwide, long-term, major beneficial impacts to park management and operations. However, construction and maintenance projects sometimes disrupt park operations, cause traffic delays and ground disturbance, degrade air quality due to dust, and introduce noise pollution that must be managed. These would be local, short-term, minor adverse impacts to park management and operations. Future road maintenance projects, such as the proposed Porcupine Forest road rehabilitation project, could add similar cumulative effects.

In addition, the park is surrounded by state, other federal agencies, and local boroughs. These entities work together to support collaborative agreements and strategies with the state and other federal agencies for resource protection, wildfire management, maintenance, and visitor protection. These collaborative strategies would continue. The Interpretation Division would continue to offer programs to special interest groups in the region and education programs the Denali Borough School District. The Concessions Division would continue to oversee concession contracts and coordinate with concessioners. The Maintenance Division would continue to maintain buildings and utilities in the road corridor and the Park Road itself according to established design standards. Implementing the park education and business plans would allow interpreters and park managers to more strategically deploy fiscal and personnel resources. The cruise ship and rail industries would continue to transport thousands of visitors to the park, ensuring a steady revenue stream for the park and concessioners. These would continue to be parkwide, major, long-term, beneficial impacts.

Executing the 2006 *South Denali Implementation Plan* with its new southside destination could alter how visitors use the park, requiring changes to law enforcement, interpretation, and maintenance services. The park would have to modify how it provides law enforcement, emergency response, and interpretive services and there potentially could be increased maintenance needs. However, projected economic development at the new access points could change the services needed through concessioners, and increased revenues could minimize impacts on the park's ability to provide services to visitors. As a result, there would be long-term, major beneficial impacts to park management and operations.

When these past, present, and future actions are combined with the long-term, minor adverse impacts of alternative A, the cumulative effects under alternative A would be short term, moderate, and adverse, and long term, major, and beneficial. The no-action alternative would contribute minimally to these effects.

Conclusion

In general, continuing park operations under the no-action alternative would have local, long-term, minor adverse impacts to park operations along the Park Road. Changes in park staffing, infrastructure, and budget would not be needed to implement this alternative.

ALTERNATIVE B

Analysis

This alternative would promote maximized seating on all transit and tour vehicles to offer the largest number of visitors the opportunity to travel the Park Road. Visitors would have access to a highly structured transportation system that offers predictability, efficiency, and greater opportunity to have a park experience of choice, while meeting set standards for natural resource protection and visitor experience. Management zones along the Park Road would remain as described in the 1997 *Entrance Area and Road Corridor Development Concept Plan*.

Under this alternative, many of the park division functions would remain the same. However, the addition of the economy tours could affect duties and responsibilities of some divisions. The National Park Service might conduct a study to explore the effects of larger buses than the current design for use in Wildlife Viewing Subzone 1 (Savage River to Teklanika). The Superintendent's Office, Administrative Division, and Maintenance Division functions would largely remain the same as those described under alternative A: No Action. Therefore, alternative B would have parkwide, long-term, neutral impacts on the Superintendent's Office; the Center for Resources, Science, and Learning; and the Maintenance Division as their functions relate to managing the Park Road.

Under alternative B, the transit and self-guided economy tour services would be combined on the same bus to provide the greatest number of visitors an affordable option for accessing the park. Transit riders would depart from the Wilderness Access Center, while tour riders would depart from the Denali Visitor Center. It is anticipated that many visitors would elect to take the economy tour (over the transit service) because (1) there would be additional interpretation materials provided, which would add to the visitor experience, and (2) the tickets would cost less when compared to premium tours. The National Park Service envisions that, while the number of visitors electing to take short and long premium tours might decrease, a core group of visitors would continue to choose this option with its greater visitor services.

On a short-term basis, the Interpretation Division would need to dedicate additional staff to develop interpretive materials for the new tour. In both the short term and long term, the added responsibilities of operating the new economy bus tours would increase the amount of time the Concessions Division would need to coordinate with the concessioner in scheduling and operating the tours, which could strain the division's current staff's ability to carry out other division functions. The increased number of individuals taking the economy tour also would increase the amount of time and energy the Interpretation Division and/or concessioner would need for taking reservations, issuing tickets, and creating and dispensing interpretive materials. Adding additional NPS and/or concession staff (possibly supported by increased revenues from the new tour) would reduce the intensity of adverse impacts.

Having NPS access to duty stations on the restricted portions of the Park Road (Savage River to Wonder Lake) via an employee shuttle system and having employee guests use the transit system would reduce the number of private vehicles on the Park Road and allow greater flexibility in managing the transportation system. However, employees and guests would need to plan their transit activities so they conform to shuttle and transit schedules (and the availability of seats on transit/tour busses). Managing contractors and NPS vehicle use to minimize displacement of visitors could make planning activities within the park (research, interpretive programs, etc.) logistically challenging. The increased cost of paying west district employees for travel time to their work stations is estimated in appendix B and would require either additional

funding to get the same amount of work done or would end up with fewer work hours available to do the same amount of work as in alternative A.

Combining the professional photography and commercial filming permitting programs would increase the efficiency of managing these programs. Requiring visitors in RVs to access Teklanika River Campground during designated times would require additional oversight, but phasing in tents-only camping and requiring campers to access the campground via the transit/tour system would eliminate the need to oversee the current program which allows RV access with a 3-night permit. Under alternative B, a formal program using indicators, standards, and adaptive management tools would be instituted to monitor resource conditions and visitor experience. This program would require additional staff and hardware for monitoring and data analysis as estimated in appendix B. The program would provide park staff consistent and reliable data on the condition of sensitive resources and values. This would allow the park staff to plan and allocate human and fiscal resources and to proactively adapt management actions as needed. This approach would require a substantial change in how vehicles are managed along the Park Road, including some investment in staffing to ensure adequate resources are available to effectively conduct park operations.

While there could be some short-term, moderate, adverse impacts on park operations and management as a result of implementing a new vehicle management program, it is ultimately anticipated that alternative B would increase the effectiveness and efficiency of managing vehicles along the Park Road, resulting in long-term, minor, beneficial effects.

Cumulative Impacts

Past, present, and reasonably foreseeable actions that would contribute cumulative impacts under alternative B would be the same as those under alternative A. When combined with the long-term, moderate, beneficial impacts of alternative B, the cumulative effects would be long-term, moderate, and beneficial. Alternative B would contribute substantially to these impacts.

Conclusion

While there could be some short-term, moderate, adverse impacts on park operations and management as a result of implementing a new vehicle management program, it is ultimately anticipated that alternative B would increase the effectiveness and efficiency of managing vehicles along the Park Road, resulting in long-term, minor, beneficial effects.

ALTERNATIVE C

Analysis

This alternative would promote a variety of visitor opportunities that range from brief experiences in the park's entrance area, to short and long visits along segments of the Park Road, to multiday experiences in the park's backcountry. Visitors would have opportunities for spontaneity and freedom during their park visit, while set standards for resource condition and visitor experience would be met. A Wildlife Viewing Subzone 3 would be created west of Eielson Visitor Center to Wonder Lake, which would be managed for the lowest traffic volume on the Park Road and would not allow significant growth beyond the current condition.

The functions of the Superintendent's Office and Administration Division would remain largely the same as they are under the no-action alternative. Concession and Interpretation Division staff may experience some changes relative to the no-action alternative due the resources needed for tour bus reservations, scheduling, operations, tailoring premium tours for specific needs, and issuing tickets for three separate bus systems (transit, economy tours, and premium tours). There would be

increased staff demands on the Interpretation Division to produce interpretive materials for the economy and premium tours. There would be additional demands on the interpretation staff should NPS naturalists be used as narrators on premium tours. Time and funding would be needed to ensure adequate training and review of naturalists or concession drivers so that they meet the standards needed for the premium tours.

Under alternative C, NPS employees could use personal vehicles to access duty stations on the restricted portions of the Park Road (Savage River to Wonder Lake) during periods of low traffic volume and use the transit system during periods of high traffic volume. This would limit flexibility in getting to and from duty stations when compared to alternative A, and during periods of high traffic volume employees would need to plan their transit activities so they conform to shuttle and transit schedules (and the availability of seats on transit/tour busses). The increased cost of paying west district employees for travel time to their work stations is estimated in appendix B and would require either additional funding to get the same amount of work done or would end up with fewer work hours available to do the same amount of work as in alternative A. Managing contractors and NPS vehicle use to minimize displacement of visitors could make planning activities within the park (maintenance, research, interpretive programs, etc.) logistically challenging.

The Professional Photography and Commercial Filming programs would be merged to gain increased efficiencies in administration and oversight. Requiring visitors to access Teklanika River Campground during periods of low traffic volume would not change the management needed to oversee this program. In addition, the formal program using indicators, standards, and adaptive management tools outlined in the analysis presented for alternative B would be implemented under alternative C. This program would require additional staff and hardware for monitoring and data analysis as estimated in appendix B. This approach would require a substantial change in how vehicles are managed along the Park Road, including some investment in staffing to ensure adequate resources are available to conduct other park operations.

Therefore, while there could be some short-term, moderate, adverse impacts on park operations and management as a result of implementing a new vehicle management program, it is ultimately anticipated that alternative C would increase the effectiveness and efficiency of managing vehicles along the Park Road, resulting in long-term, minor, beneficial effects.

Cumulative Impacts

Past, present, and reasonably foreseeable actions that would contribute cumulative impacts under alternative C would be the same as those under alternative A. When combined with the long-term, minor, beneficial impacts of alternative C, the cumulative effects would be long term, moderate, and beneficial. Alternative C would contribute somewhat to these impacts.

Conclusion

It is ultimately anticipated that alternative C would increase the effectiveness and efficiency of managing vehicles along the Park Road, resulting in long-term, minor, beneficial effects. There would be some short-term, moderate, adverse impacts on park operations and management as a result of limiting staff travel during high volume periods.

SOCIOECONOMICS

METHODOLOGY AND ASSUMPTIONS

This impact topic focuses primarily on the effects of the alternatives on business, communities, and the local regional/economy. The numbers and types of jobs and incomes directly and indirectly supported by park operations and visitor spending are common measures of economic effects of an action. Quantitative projections of staffing requirements and operating expenditures associated with the alternatives are not currently available, though estimates are presented in appendix B. Consequently, this assessment is primarily qualitative, relying on informed judgment of park staff regarding staffing and expenditures requirements. Actual future outlays would reflect future NPS policies, actual on-the-ground conditions, unanticipated funding opportunities, and Congressional budget approvals for the National Park Service in general, or Denali National Park and Preserve specifically.

The transportation system would continue to be operated by a concessioner on a financially self-sustaining basis under a contractual arrangement. Therefore, future changes in system costs would be reflected in differences in fares as compared to current prices. However, fares may vary between alternatives, and among trip and tour type due to differences in operating costs, services offered, and system utilization and efficiency.

Measure

Foreseeable effects identified in conjunction with this vehicle management plan would have three primary sources:

- changes in park or concessioner staffing to provide transportation services at park
- changes in operating expenditures related to provision of transportation services
- changes in the levels of visitor spending

Intensity Definitions

Minor: Effects on concessioners, other private businesses, nearby communities, other affected governmental agencies, local community infrastructure, and social conditions would be small, geographically localized, affect few people, comparable in scale to typical year-to-year or seasonal variations, and not expected to substantively alter established social or economic structures.

Moderate: Effects on concessioners, other private businesses, nearby communities, other affected governmental agencies, local community infrastructure, and social conditions would affect many people, and could have effects on the established economic or social structure and conditions.

Major: Effects on concessioners, other private businesses, nearby communities, other affected governmental agencies, local community infrastructure, and social conditions would affect a large segment of the population, and have a substantial influence on the established social or economic conditions.

ALTERNATIVE A (NO-ACTION ALTERNATIVE)

Analysis

Maintaining current operations of the transit and tour system under the no-action alternative would occur against a backdrop of other economic, demographic and social change affecting the surrounding area.

Demographic projections prepared by the State of Alaska portend population declines in Denali Borough through 2030 (see figure 22). Under the "low" growth scenario, which assumes long-term out-migration due to aging of the population and lack of major new natural resource development, the Borough's population would decline by more than 500 residents through 2030, a decline of more than 27%. A "high" growth option, which assumes renewed net immigration in the state, but with no specific cause specified, would see population remain near present levels through 2015, then decline to about 1,740 in 2030. (ADLWD 2007)

Corresponding projections for the state indicate total change ranging between 66,000 (8%) and 127,000 (31%) residents. Virtually the entire projected net change in resident population would occur in the Anchorage, Matanuska-Susitna, and Fairbanks North Star Boroughs.

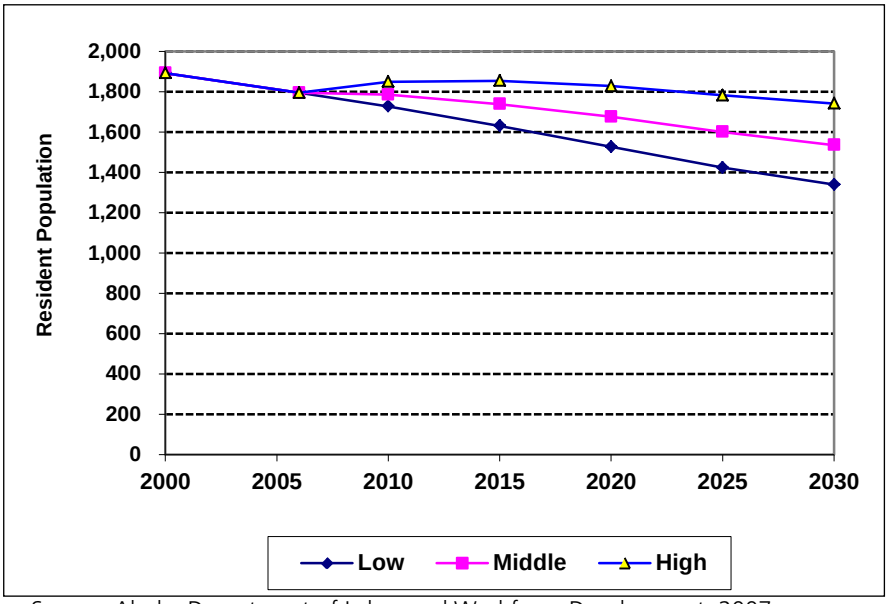
Implicit in these population projections are perspectives regarding underlying economic and demographic trends—little new economic opportunity coupled with net natural loss and/or outmigration in Denali Borough, in contrast to moderate economic expansion and immigration in the 3 more heavily populated boroughs. Economic growth, including more jobs in retail trade, services, health care, and residential construction, for example, will accompany the population growth in the latter.

In actuality, the economic outlook for the Denali Borough is tied closely to visitation to and operation of the park, along with several other major employers. Under the no-action alternative, the transit and tour system would continue in its current operational configuration, i.e., same menu of tours and shuttle operations, trip allocations for inholders, and fleet size.

Under the no-action alternative, long-term trends in annual visitor use at Denali National Park would reflect general economic conditions, the domestic and international climate for vacation travel to Alaska, the marketing and availability of capacity provided by the cruise industry and other land-based tour providers, and numerous other external and local influences. Given the uncertainties associated with these influences, forecasts of summer visits to the northern portion of the park prepared as part of this plan, benchmarked to actual 2007 and 2008 visitation, portray a reasonable range of outcomes for visitation over the next decade. Annual summer visitation under a low growth scenario, combining a sharp recession-related drop off in 2009 with assumptions of slow recovery in the cruise industry and land tours and slow growth in the number of independent travelers, would increase slightly, but remain nearly 20% below recent levels. A high growth scenario, assuming a combination of future increases in cruise capacity, aggressive marketing by the cruise companies to fill the available berths and spaces on the Denali land tours, and strong growth in the independent visitor market segment, yields an increase of approximately 20% above 2007 visitation levels by 2018(see figure 23).

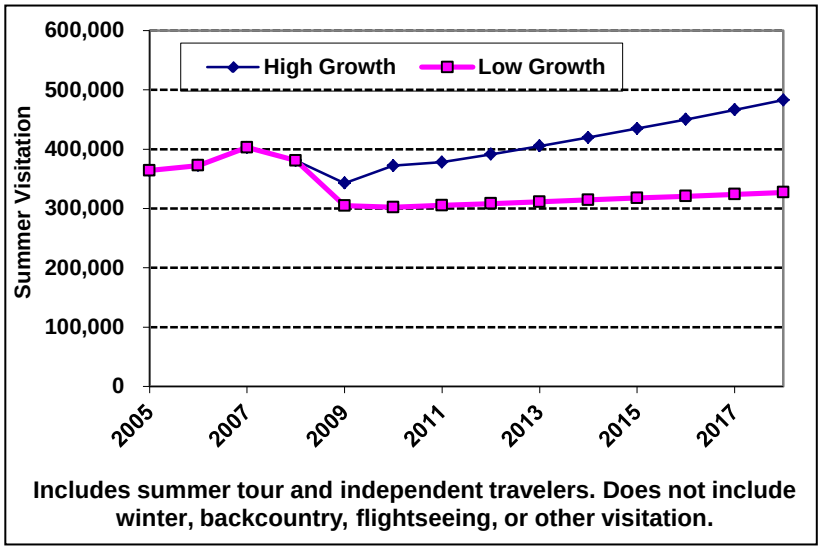
Although not evident in the above forecasts, recreation visitation to Denali National Park and Preserve would maintain its pronounced seasonality.

Figure 22. Projected Population of Denali Borough under Three Scenarios of Statewide Growth



Source: Alaska Department of Labor and Workforce Development, 2007.

Figure 23. Forecasted Summer Visitation to Denali National Park and Preserve



Source: Denali Park Road – Alternatives for Vehicle Management (NPS 2009g).

Regional Economy

The current transit and tour system operation provides capacity to accommodate increased ridership under the no-action alternative. Consequently, Denali National Park and Preserve, including the visitor transportation system, would continue to be a major contributor supporting the economic base of the Denali Borough in terms of jobs, income and local government revenues. Park-related contributions would increase over time, in response to visitor use and increased ridership on the transit and tour system.

Visitor spending by park visitors at concession operations in the park, and at stores, motels and hotels, and other tourism-related businesses and attractions in the local area (Nenana Canyon and McKinley Village) would change in response to changes in recreation visitation. Entrance fee receipts collected in conjunction with tickets sold for the transit and tour system, as well as the levels of campground use would generally track changes in recreation visitation. Park staff familiar with the current transit and tour system see a potential for increased visitor use under the high growth scenario that could eventually tax the capacity of the current system.

Implementing the no-action alternative would support the sustained economic infusion to the region associated with transit and tour system-related park administration and concessioner operation expenditures over the life of this plan. No major changes in NPS staffing levels or budgeted resources to fund park administration of the concession operated transit and tour system would be anticipated under the no-action alternative. Some increases in concessioner staffing might be required to accommodate increased ridership under the no-action alternative. The infusion would result from ongoing system operating expenditures, including staff payroll, operating and maintenance expenditures, capital outlays, and the costs for employee housing, dining, and fringe benefits. No major changes in staffing levels or budgeted resources to fund park administration of the concession operated Visitor Transportation System would be anticipated under the no-action alternative.

Implementation of the no-action alternative would not dramatically alter the region's economic dependency on seasonal tourism.

Population and Demographics

Population forecasts for the Denali Borough portray futures ranging from a degree of relative long-term stability to steady decline. Long-term visitation forecasts for the park suggest that the vehicle management plan would provide a stabilizing influence for the Borough's resident population under the no-action alternative. However, that influence may be insufficient to offset declines emanating from other sectors of the economy or underlying demographic trends. At the same time, meeting the demands of park visitors would sustain the strong seasonal influence exerted by overall visitation on attracting 1,500 to 2,000 temporary residents to the area each day of the summer. Staffing for the transit and tour system, which contributes to that influx, would continue at approximately current levels.

Public Facilities and Services and Local Governance

Changes in park-related demands on community services and facilities in Denali Borough and other nearby communities in Alaska would result from increases in future visitation, but there would be little direct or indirect effect related to the transit and tour system operation under the no-action alternative. The local solid waste operations and fire protection/ emergency medical responders would for example, see an increase in demand from visitors traveling through the area and staying in local hotels, motels or in second homes. The added demands, dispersed over time and location, are unlikely to require additional capacity or staffing.

Overnight lodging tax revenues generated by visitor spending are a major revenue source for Denali Borough, supporting borough governance, local public education, and various public facilities and services. Annual receipts would likely increase under the no-action due to an increase in the level of visitor use, and the indirect effects of that increase in raising average nightly room rates.

Cumulative Effects

From an economic and social perspective, one cannot readily isolate the park from past, present, and future development in the surrounding area. Past human activity and development actions in and near the park are largely responsible for existing land use and development patterns, and for existing transportation facilities that provide access to the park. Those uses and patterns are tied to the cultural and historical landscapes.

The primary past and ongoing actions related to current social and economic conditions include

- redevelopment of the park entrance area
- closure of the Park Road to most private vehicles and subsequent implementation of the concessioner operated Visitor Transportation System
- completion of the George Parks Highway
- development of the cruise/tour market highlighting the park, the associated rail and bus transportation linkages to Anchorage and Fairbanks, and the commercial services and lodging base in Nenana Canyon

These actions corresponded with, and in many cases facilitated the increases in visitor use that underlie current social and economic conditions in the area. Manifestations of the cumulative effects of these actions include year-round and seasonal employment and population in the area, established economic linkages to Fairbanks, Talkeetna, and Anchorage, and local public facilities and services. These effects are major, long term, and beneficial at both a local and regional level. Additional cumulative effects of future actions would include similar long-term, moderate, beneficial social and economic effects associated with implementation of the *South Denali Plan*, construction and maintenance of new trails in the frontcountry, and prospective future commercial development outside of the park. Long-term economic effects indirectly associated with the *South Denali Plan* may include increased visitor use to the park, beyond that occurring in the northern portion of the park, with correlative benefits for visitor-related businesses in the Talkeetna area. Combined with these effects, the no-action alternative would result in long-term, major, beneficial, local and regionwide cumulative effects. The no-action alternative would contribute substantially to these effects.

Conclusion

Implementation of the no-action alternative would have little, if any, effect on future local population growth, but would contribute to the major temporary, seasonal population influx to the local area. Alternative A would also sustain existing linkages between park visitation, transit and tour system operations, the local and regional economy, the local communities, public facilities and services, and local government revenues over the foreseeable future. These links and their effects are major, primarily beneficial, and long term at the local level, and moderate, beneficial, and long term at the regional level.

ALTERNATIVE B

Analysis

Implementing alternative B would occur against the same backdrop of economic, demographic, and social conditions in the region, including the underlying market for tourism/travel to Alaska, as under the no-

action alternative. The effects of alternative B would add another set of influences affecting the region's economic and social environment, but leave the foundation of the area's economic and demographic outlook unchanged

Effects on the Local and Regional Economy

Implementation of alternative B would promote the provision of maximum seating on transit and tour buses continuing west beyond the Savage River check station. Transportation services provided under alternative B would include scheduled transit service and self-guided economy tour options sharing available seating on a bus, and guided premium short and long tours on tour buses which offer visitors opportunities to understand the park's natural and cultural resources. Implementation of alternative B would be coupled with development of additional interpretive materials and programs. Some guided long premium tours could offer professional interpretive presentations and guided talks. Alternative B may include reallocating capacity between the transit and premium services tours to respond to demand, altering the mix of transit and tour buses. Buses with higher seating capacities might be suitable for use on premium short tours traveling as far as the Teklanika turnaround. Future conversion of the Teklanika River Campground would allow additional schedule and frequency flexibility to respond to net increases in overall visitor use and demand for transportation services.

Implementation of alternative B would sustain, and potentially increase the economic contributions of Denali National Park and Preserve, supporting the economic base of the Denali Borough. Sources of the potential added economic stimulus include additional park staffing, increases in concessioner staffing and payroll over time in response to increases in transit and tour system capacity, and changes in visitor spending. The economic contributions would consist primarily of local consumer expenditures, including additional outlays for lodging, food and beverages.

Direct incremental staffing requirements for the park are estimated at up to 7.75 FTEs in conjunction with alternative B, 5% above the park's currently authorized staffing level. The need for additional park staffing would arise in conjunction with implementing the adaptive management process, including collection and analysis of monitoring data, and to respond to increased demand for visitor services at the Denali Visitor Center. Most, if not all, the additional staffing would be seasonal. Some increase in staffing could occur in advance of implementation of the operational changes and would continue long term. Alternative B would not require additional major capital expenditures by the National Park Service. An increase in budgeted funds for NPS operations is assumed for alternative B. Available resources would include base budget appropriations, concession revenues, and entry and camping fees.

Concessioner staffing levels are generally a function of the number of hours of bus operations, bus fleet size, and operational needs of the on-site reservations and ticketing system. Annual hours of bus operations would in turn depend on future ridership and decisions about the mix of transit and tour departures, number of departures to various turnaround locations, and seating capacity of buses used on the short tours. The potential increases in the number of tours and extended travel distances for the premium tours, as compared to current tours, suggest increases in concessioner transportation-related seasonal employment of up to 15 percent (as many as 50 positions) over time. Increases in the number of visitors accessing the Denali Visitor Center related to tour-origination or stops upon return would likely require additional staff at the food service area. Future increases in concessioner staffing levels associated with the changes in transit and tour system operations would continue long term and result in additional

concessioner expenditures related to system operations, e.g., payroll, fuel, utilities, and for dining, housing, and other employee related expenses. Additional employee housing may also be required. A portion of the higher payroll would flow into the local economy in the form of consumer expenditures.

Lodges, RV parks, and other businesses in the area may also increase staffing to provide shuttle service from Nenana Canyon to the Wilderness Access Center and Denali Visitor Center for guests accessing the transit/self-guided economy and premium-short tours, respectively.

Total visitor spending in the local area would increase assuming implementation of alternative B. Much of higher spending would stem from transit and tour fares set to cover the cost of system operation. Additional spending may be realized at the food service area and Alaska Geo retail store at the Denali Visitor Center and at the Toklat Rest Area in response to higher number of visitors accessing these locations. Some of this spending would likely be a redistribution of spending that would have otherwise occurred at establishments in the local area outside the park.

Implementation of alternative B could indirectly result in increased total visitor spending in the local area if the enhancement in visitor experiences associated with the premium tours, off-bus recreation and educational opportunities, and options for the economy tours result in extended duration of stay by those visitors, changes in visitor demographics, or higher levels of visitor use. Locally, stores, motels and hotels, and other tourism-related businesses and attractions in the local area (Nenana Canyon and McKinley Village) would be the beneficiaries of the increases in spending. At the regional level, the Alaska Railroad and bus transportation and tour companies transporting visitors to and from the park would also benefit. The likelihood and potential magnitude of such changes cannot be forecast with any degree of certainty, but are a reasonable effect associated with alternative B.

Alteration of the seasonal pattern of visitation may be associated with the potential capacity increases and changes in system operations from implementing alternative B.

The indirect effects of future increases in park and concessioner employment would include increases in secondary, seasonal employment within the local economy. Labor earnings paid by local employers would also increase, but a substantial portion those earnings would leave with the employees at the end of the season.

Entrance fees collected in conjunction with the sale of tickets for the transit and tour system and the sale of various annual passes, along with camping fee receipts, would generally reflect changes in recreational visitation to the park. Over time, some limited scale reduction in camping fee receipts could occur as RV camping is displaced from the Teklanika River Campground, with the net effect depending on whether such use is accommodated at the Riley Creek campground or shifts outside the park.

Implementation of alternative B would maintain overnight lodging access on the park road to Kantishna inholders at current allocation levels in the general management plan. Additional day-use access needs would be met via the transportation system. The net effect of these access provisions would be to sustain current commercial overnight lodging operations and provide for additional day-use using a combination of traditional and transit and tour system access.

Effects on Population and Demographics

Implementation of alternative B would have little impact on long-term population growth in the area. The direct increases in park and concessioner employment would be minor,

as would indirect employment gains due to direct increases and changes in visitor spending and visitor use. Because of the seasonal nature of the employment, few job seekers would relocate to the area on a permanent basis. Rather, the vast majority of the jobholders would be seasonal residents, typically arriving to the area in early/mid-May and departing in September. As is currently the case, many among the expanded cadre of bus drivers would likely return year after year to work in the park.

The availability of other seasonal jobs tends to attract many younger, often college aged, unmarried workers. Few children are among the seasonal immigrants. Implementation of alternative B would not alter these patterns.

Public Facilities and Services and Local Governance

Impacts on locally provided public facilities and services associated with implementation of alternative B would additional demands on Denali Borough's administrative services, solid waste management and emergency medical and fire protection services. The demands would be long-term, but limited in scale relative to the demands associated with the current year-round and seasonal populations in the local area. The incremental demands, dispersed over time and location, are unlikely to require additional capacity or staffing.

Implementation of alternative B would have no effect on public education in Denali Borough due to the seasonal nature and timing of the tourism season

Overnight lodging tax revenues generated by visitor spending are a major revenue source for Denali Borough, supporting borough governance, local public education, and various public facilities and services. Annual receipts would likely increase under alternative B due to an increase in the level of visitor use, and the indirect effects of that increase in raising nightly room occupancy rates.

Cumulative Effects

Past, present, and reasonably foreseeable actions that would contribute cumulative impacts under alternative B would be the same as those under alternative A. The cumulative effects from an economic and social perspective including alternative B, would be major, long term, and beneficial at both a local and regional level. Alternative B would contribute substantially to these effects.

Conclusion

The economic effects, including those on employment and income, related to alternative B would be major, local and regional, long term and beneficial. Long-term social consequences include minor increases in temporary/seasonal population and demands on community infrastructure and services. Potential long-term consequences would also include indirect effects on lodging tax revenue, a key revenue source for the Denali Borough. The net effect of the increases in demand and revenue on the borough would be beneficial given the existing facility and service capacity to serve current levels of seasonal visitation in the local area.

When compared to alternative A, alternative B would result in minor incremental beneficial effects stemming from the increases in park and concessioner employment, payroll and other operating expenditures associated with the operation of the transit and tour system. The incremental effects would begin to occur upon implementation of alternative B.

ALTERNATIVE C

Analysis

Implementing alternative C would occur against the same backdrop of economic, demographic, and social conditions in the region, including the underlying market for tourism/travel to Alaska, as under the no-action alternative. The effects of the

alternative C would add another set of influences affecting the region's economic and social environment, but leave the foundation of the area's economic and demographic outlook unchanged.

Effects on the Local and Regional Economy

Implementation of the alternative C would promote the provision of a transportation services along the Park Road to offer a variety of visitor experiences.

Transportation services provided under Alternative C would include three distinct options: transit service similar to that currently provided, self-guided economy tours via a dedicated bus system, and guided premium tours. The transit and self-guided economy tours would reach various destinations along the Park Road. Transit service schedules would provide some capacity to transfer between buses to continue travel further into the park. Specially focused tours and activities could be offered on some guided premium long tours, with tour size tailored to demand and the needs and constraints of the tour program. Accommodating smaller tour sizes could result in a minor decrease in overall potential seating capacity on transit and tour buses headed west on the Park Road beyond the Savage River check station (Mile 15). That effect may be offset in part, by more efficient capacity utilization on the other trips achieved by closer matching of supply and demand.

Implementation of alternative C would sustain, and potentially increase the economic contributions of Denali National Park and Preserve supporting the economic base of the Denali Borough. Sources of the potential added economic stimulus include additional park staffing, changes in concessioner staffing levels, and changes in visitor spending. The economic contributions would consist primarily of local consumer expenditures, including additional outlays for housing.

Direct incremental staffing requirements for the park are estimated at up to 8.75 FTEs in conjunction with alternative C, approximately 6% above the park's currently authorized staffing level. The additional park staff would be associated with implementation of the adaptive management process and to provide interpretive programs, including tours, talks and activities, on guided premium tours. Most, if not all, of the new positions would be seasonal. The increases in staffing related to the adaptive management process could occur in advance of the actual implementation of transportation operational changes and would continue long-term. Alternative C would not require major capital expenditures by the National Park Service. An increase in budgeted funds for NPS operations is assumed for alternative C. Available resources would include base budget appropriations, concession revenues, and entry and camping fees.

Staffing levels for the concessioner are generally a function of the number of hours of bus operations, bus fleet size, and operation of the on-site reservation and ticketing system. The potential increases in the number of tours and extended travel distances for the premium tours, as compared to current tours, and operation of the transit service on a regular schedule suggest increases in concessioner transportation-related seasonal employment of up to 20 percent (as many as 70 positions) over time. Implementation of a shuttle system serving the entrance area to facilitate visitor access from the Denali Visitor Center to the Wilderness Access Center, and increases in the number of visitors accessing the Denali Visitor Center and food service area, would likely also require additional staffing. Future increases in concessioner staffing levels associated with the changes in transit and tour system operations would continue long-term and result in additional concessioner expenditures related to system operations, e.g., payroll, fuel, utilities, and for dining, housing, and other employee related expenses. Additional employee

housing may also be required. A portion of the larger payroll would flow into the local economy in the form of consumer expenditures.

Total visitor spending in the local area would likely increase assuming implementation of Alternative C. Most of additional spending would be in the form of fares set to cover the cost of system operations, including higher fees related to smaller, focused tours. Additional spending may be realized at the food service area and at the Alaska Geo shops located at the Denali Visitor Center and Toklat Rest Area. Some of this spending would likely be a redistribution of spending that would have otherwise occurred in the local area outside the park.

Implementation of alternative C could indirectly result in increased total visitor spending in the local area if the enhancement in visitor experiences associated with the guided long premium tours, off-bus recreation, and options for the self-guide economy tours result in extended duration of stay by those visitors, changes in visitor demographics, or higher levels of visitor use. Locally, stores, motels and hotels, and other tourism-related businesses and attractions in the local area (Nenana Canyon and McKinley Village) would be the beneficiaries of the increases in spending. At the regional level, The Alaska Railroad and bus transportation and tour companies would likely also benefit. The likelihood and potential magnitude of such changes cannot be predicted with any degree of certainty, but could be a reasonable outcome of alternative C. Implementation of alternative C would not result in any major changes in the seasonal pattern of visitor use.

The net effects of future increases in park and concessioner employment would include increases in secondary, seasonal employment within the local economy. Labor earnings paid by local employers would also increase, but large portions those earnings would flow from the economy when the seasonal employees leave at the end of the season.

Entrance fees collected in conjunction with the ticket sales for the transit and tour system and the sale of various annual passes, along with receipts of camping fees, would generally track changes in recreational visitor use.

Implementation of alternative C would maintain overnight lodging access to Kantishna inholders at current allocation levels in the general management plan. Additional access needs to Kantishna would be met via the transportation system, possibly involving coordinated pickup or drop off transfers with transit or economy tour buses at the Eielson Visitor Center and Wonder Lake turnaround.

Effects on Population and Demographics

Implementation of alternative C would have little impact on long-term population growth in the area. The direct increases in park and concessioner employment would be minor, as would indirect employment gains due to direct increases and changes in visitor spending and visitor use. Because of the seasonal nature of the employment, few job seekers would relocate to the area on a permanent basis. Rather, the vast majority of the jobholders would be seasonal residents, typically arriving to the area in early/mid-May and departing in September. As is currently the case, many among the expanded cadre of bus drivers would likely return year-after-year to work in the park.

The availability of other seasonal jobs tends to attract many younger, often college aged, unmarried workers. Few children are among the seasonal immigrants. Implementation of alternative C would not alter these patterns.

Public Facilities and Services and Local Governance

Impacts on locally provided public facilities and services associated with implementation of alternative C would create additional

demands on Denali Borough's administrative services, solid waste management, and emergency medical and fire protection services. The demands would be long term, but limited in scale relative to the current demands associated with the year-round and seasonal populations in the local area. The incremental demands, dispersed over time and location, are unlikely to require additional capacity or staffing.

Implementation of alternative C would have no effect on public education in Denali Borough due to the seasonal nature and timing of the tourism season.

Overnight lodging tax revenues generated by visitor spending are a major revenue source for Denali Borough, supporting borough governance, local public education, and various public facilities and services. Annual receipts would likely increase under alternative C due to an increase in the level of visitor use, and the indirect effects of that increase in raising average nightly room rates.

Cumulative Effects

Past, present, and reasonably foreseeable actions that would contribute cumulative impacts under alternative C would be the same as those under alternative A. The cumulative effects, from an economic and social perspective including alternative C, would be major, long term, and beneficial at both a local and regional level. Alternative C would contribute substantially to these effects.

Conclusion

The economic effects related to alternative C, including the effects on employment and personal income, would be major, local and regional in scope, long term and beneficial. Long-term social consequences include major temporary/seasonal population influxes and demands on community infrastructure and services. Potential long-term consequences would also include indirect effects on lodging tax revenue, a key revenue source for the Denali Borough. The net effect of the increases in demand and revenue on the borough would be beneficial given the existing facility and service capacity to serve current levels of seasonal visitation in the local area.

When compared to alternative A, alternative C would result in minor, incremental, beneficial effects stemming from the increases in park and concessioner employment, payroll and other operating expenditures associated with the operation of the transit and tour system. The incremental effects would begin to materialize upon implementation of alternative C.

UNAVOIDABLE ADVERSE IMPACTS

The National Park Service is required to consider if the alternative actions would result in impacts that could not be fully mitigated or avoided (NEPA Section 101(c)(ii)). For any alternative, vehicle traffic and off-bus human activity along the Park Road would continue to have a variety of adverse effects on wildlife and wildlife habitat along the Park Road corridor, such as increased stress in individual animals, habitat fragmentation, and disturbances to foraging, movement, or caring for young.

Alternatives B and C are projected to involve a seasonal increase and a daily increase in bus volumes on the Park Road (assuming a full schedule). Although the use of indicators, standards, BACI studies, and adaptive management measures would help minimize the potential for adverse effects to wildlife associated with any increases, these effects would not be completely mitigated or avoided.

Under the no-action alternative, there could be unavoidable adverse impacts on visitor use and enjoyment. These would relate to the limited availability of seats on eastbound buses to pick up hikers and campers, and the associated wait times; limited changes in the ability to access park features; and the lack of a low-cost tour option (which affects both cost of access and access to park features).

Under alternative B, although most impacts on visitor use and enjoyment would be beneficial, unavoidable adverse impacts would occur related to the effects of combining transit with an economy tour on the same bus and eliminating camper buses (e.g., difficulty for campers and hikers to find seats with adequate space for gear, or concerns about seating availability that could affect opportunities for off-bus experiences); the potential for phasing-in tents-only camping at the Teklanika River Campground, which would eliminate the opportunity for RV camping; and the potential for using larger buses (if studies show this can be done), which may negatively affect comfort for some as a result of having to ride with more people.

As with alternative B, most impacts on visitor use and enjoyment under alternative C would be beneficial. However, some unavoidable adverse impacts could occur related to the inconvenience created by limiting access to the Teklanika River Campground to periods of low-traffic volume.

Unavoidable adverse impacts could also occur on socioeconomic resources, but would be expected to be minimal. For example, all alternatives would contribute to major, temporary, seasonal population influx to the local area. For the most part, employers provide for the housing needs of the residents, limiting adverse impacts on the community. With the potential to accommodate more visitors (should the demand exist) under alternatives B and C, there could be minor increases in temporary, seasonal population and demands on community infrastructure and services.

There also would be unavoidable adverse impacts for the transportation system and traffic under the alternatives as well. Under alternative A, these impacts would be related to transportation system transit bus capacity and Tundra Wilderness Tour bus demand exceeding capacity some days during the peak season. Under alternative B, how people can access the park would be limited to transit or tour buses, leading to modest increases in passenger volumes.

Alternative C would have unavoidable adverse impacts on the transportation system due to the need to incorporate a

separate self-guiding tour bus system, the potential need to acquire different-sized buses to meet the demand of the various premium tours, and the need for increased coordination among transit buses, self-guiding tour buses, and premium tour buses.

SUSTAINABILITY AND LONG-TERM MANAGEMENT

In accordance with NEPA, and as further explained in NPS Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*, consideration of long-term impacts and the effects of foreclosing future options should be included throughout any NEPA document. According to Director's Order 12, and as defined by the World Commission on Environment and Development, "sustainable development is that which meets the needs of the present without compromising the ability of future generations to meet their needs." For each alternative considered in a NEPA document, considerations of sustainability must demonstrate the relationship between local, short-term uses of the environment and the maintenance and enhancement of long-term productivity. The National Park Service must consider if the effects of the alternatives involve tradeoffs of the long-term productivity and sustainability of park resources for the immediate short-term use of those resources. It must also consider if the effects of the alternatives are sustainable over the long term without causing adverse environmental effects for future generations (NEPA Section 102(c)(iv)).

None of the alternatives described in this draft plan/environmental impact statement would involve facility development that could cause a loss of ecological productivity in the park, nor would any alternative affect the ability of the National Park Service to conduct their operations sustainably. While the Park Road would continue to be used by the public under all alternatives described in this draft plan/ environmental impact statement, the National Park Service would seek opportunities to reduce fossil fuel consumption (via the use of alternative energy vehicles and other fuel saving policies) which, over time, could enhance sustainability of visitor access to the park. In addition, the National Park Service would continue to manage visitor use consistent with the preservation of natural and cultural resources. Although use could increase under alternatives B and C if the demand exists, the formal program of indicators, standards, and adaptive management would minimize the potential for impacts on the long-term productivity of biotic communities—primarily wildlife populations.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are actions that result in loss of resources that cannot be restored. An effect to a resource is irreversible if it (the resource) cannot be reclaimed, restored, or otherwise returned to its pre-disturbance condition.

With the exception of the consumption of fossil fuels for concession and park operations and maintenance, none of the alternatives would result in irreversible commitments of resources. The continued use of the Park Road under any alternative would have effects on resources such as wildlife. While the alternatives would not cause the loss of such resources, they would result in effects to wildlife and wilderness character that could not be reclaimed, restored, or otherwise returned to pre-disturbance conditions. For example, the presence of vehicles along the road and people at transportation nodes would continue to affect wildlife behavior, movement, and stress levels. Some individual animals would avoid the disturbance areas along the Park Road, while others would continue to become habituated to human presence.

Also, opportunities to experience solitude and the undeveloped nature of the wilderness at Denali would be affected primarily by the continued visual and noise disturbances associated with vehicle use along the Park Road, and from the concentrated human activity and imprints at the park's transportation nodes and the road itself.

Chapter 5
Consultation and Coordination

Back of divider

PUBLIC INVOLVEMENT

OVERVIEW

The *Denali Park Road Vehicle Management Plan / Environmental Impact Statement* represents the culmination of over two years of concerted planning, analysis, and input provided by the National Park Service planning team, park staff, Native Alaskan groups, other government agencies, and the public. The process of consultation and coordination was vitally important throughout this planning project. The public participated in the development of this document by providing input at public meetings, responding to newsletters and by submitting comments by regular mail and electronically through the NPS planning website at http://parkplanning.nps.gov/dena/.

PUBLIC MEETINGS AND NEWSLETTERS

Public meetings and newsletters were used to inform the public of the plan and to involve them in the planning process. A mailing list was compiled of members of governmental agencies, Native Alaskan groups, organizations, legislators, local governments, and other interested citizens. Comments and suggestions offered by participants have provided NPS planners with important insights about what visitors, neighbors, officials, and others value about Denali National Park, their experiences traveling along the Park Road, and what NPS managers can or should do to improve visitor experiences while ensuring the protection of resources.

The notice of intent to prepare an environmental impact statement was published in the *Federal Register* on Tuesday, August 12, 2008 (Vol. 73, No. 156).

Public Scoping

During the summer of 2008, the National Park Service issued a public newsletter announcing the vehicle management plan / environmental impact statement. The newsletter identified the Park Service intent to evaluate a range of alternatives for managing vehicles on the Park Road, and presented background information to support the decision to undertake the plan. The newsletter invited public comments, concerns, and suggestions to assist the planning team with specific regard to the following topics:

- Alternative approaches and ideas for accomplishing project goals.
- The range of environmental and socioeconomic issues that need to be considered.
- Other potential projects that might affect or be affected by the project.
- Information that needs to be considered (such as related research) and why it should be included.
- Information on how visitors and others use the park, and how the project might affect that use.
- Concerns about conditions or activities in the park related to the planning project, and suggestions for improvement.

The National Park Service also held four public open-house scoping meetings for this plan during September 2008. Meetings were held in Anchorage (September 3, 2008); Susitna Valley (September 4, 2008); Denali Park (September 10, 2008); and Fairbanks (September 11, 2008). The National Park Service provided a brief presentation of the planning project at each meeting. Approximately 58 people attended the meetings.

After the comment period closed, the National Park Service issued a second newsletter during the fall of 2008 that summarized the comments and feedback provided by the public and park staff during the public scoping period. Comments were received on topics including type of vehicle, type of services, scheduling, vehicle numbers, information, reservations, and booking, and interpretation.

Planning Workbook and Workshops

The Denali Park Road Planning Workbook provided background information and preliminary concepts for the Vehicle Management Plan and EIS. Public review of the workbook was held between January 1, 2010 and March 1, 2010. The public was invited to provide thoughts and suggestions by filling out a comment form or submitting comments online.

A series of public workshops was held in February 2010 to discuss the preliminary concepts, and to provide information on how the alternatives will be developed. Members of the public were invited to discuss the workbook and to share their suggestions with park staff. The workshops were held in Denali National Park (February 11, 2010), Fairbanks (February 17, 2010), and Anchorage (February 18, 2010). Approximately 80 people attended these meetings. The following summarizes the comments received on the planning workbook.

Comments addressed proposed changes to management zoning and desired conditions, the proposed vision for the Denali Park Road transportation system, proposed goals and objectives, potential indicators, the current vehicle limit, the potential transportation system management concepts, new concept designs, potential management options for other vehicle use, access for daily NPS operations and West District required occupants, access for contractors, access to Teklanika River Campground, access for professional photography and commercial filming, access for artists in residence program, access to Kantishna inholdings, and other miscellaneous topics.

CONSULTATION WITH OTHER AGENCIES, OFFICIALS, AND ORGANIZATIONS

U.S. Fish and Wildlife Service, Section 7 Consultation

The Endangered Species Act of 1973, as amended, requires in Section 7(a)(2) that each federal agency, in consultation with the secretary of the interior, ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. During the preparation of this plan, NPS staff coordinated informally with the U.S. Fish and Wildlife Service's Ecological Services office in Anchorage.

In accordance with the Endangered Species Act and relevant regulations at 50 CFR Part 402, the National Park Service determined that actions proposed by this vehicle management plan / environmental impact statement would have "no effect" on federal threatened or endangered species, as none are present in the park. A copy of this draft plan will be sent to the U.S. Fish and Wildlife Service with a request for written concurrence with that determination.

In addition, the National Park Service will continue to consult on future actions that may be conducted under the general framework described in this plan, and carried out as part of adaptive management strategies. Additional consultation will occur as necessary to ensure that future actions are not likely to adversely affect threatened or endangered species.

Section 106 Consultation

Agencies that have direct or indirect jurisdiction over historic properties are required by Section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 470, et seq.), to take into account the effect of any undertaking on properties listed in or eligible for listing in the National Register of Historic Places. The Denali Park Road was determined eligible for listing on the national register in 2009 as a historic structure, and the Alaska State Historic Preservation Officer (SHPO) concurred with the determination. For the purposes of the present vehicle management plan, the National Park Service determined that actions proposed by the plan would not alter the road's character-defining features or the qualities that contribute to its national register eligibility. Other historic structures and districts along the road corridor were also determined not to be adversely affected by planning proposals. The topic of historic structures was therefore dismissed from analysis in this plan. Other cultural resource topics (archeological resources, ethnographic resources, cultural landscapes, and museum collections) were also dismissed from analysis because the anticipated adverse impacts on these resources from project actions were determined to be negligible to minor.

The National Park Service will send a copy of this draft plan / EIS to the State of Alaska ANILCA Implementation Program and Office of History and Archaeology (state historic preservation office) for review and comment. Affiliated Native Alaskan representatives were also consulted, in fulfillment of Section 106 requirements (see "Consultation with Native Alaskans" section below).

Involvement of Other Federal and State Agencies, Regional and Local Governments, and Partner Organizations

Denali National Park and Preserve staff meet on occasion with representatives of federal and state agencies and regional and local governments (as appropriate) on topics of mutual interest and concern, such as operating the park, preserving park resources, and making the park safe and enjoyable for visitors. The National Park Service informed these groups of the draft vehicle management plan / environmental impact statement and indicated that discussion topics and planning issues were welcomed.

Consultation with Native Alaskans

Denali National Park and Preserve staff communicated with local tribal groups regarding the vehicle management plan. The planning alternatives were developed with consideration that project actions would avoid or minimally disturb resources or values important to affiliated Native Alaskan tribes. The planning alternatives do not entail new construction or ground-disturbance, and are not anticipated to impede access to places of traditional religious, ceremonial, and other customary activities.

AGENCIES, ORGANIZATIONS, AND OTHER ENTITIES RECEIVING A COPY OF THIS DOCUMENT

FEDERAL AGENCIES

Environmental Protection Agency, EPA Region 10

U.S. Army Corps of Engineers, Regulatory Branch

U.S. Department of the Interior, Office of Environmental Policy and Compliance

U.S. Fish and Wildlife Service, Ecological Services, Anchorage

STATE OF ALASKA

Alaska Department of Natural Resources, Office of History and Archaeology

NATIVE ALASKAN TRIBES

Nikolai

Cantwell

Lake Minchumina

Tanana

Telida

NATIVE CORPORATIONS

DOYON LTD

AHTNA, Inc.

Cook Inlet Regional, Inc.

ALASKA CONGRESSIONAL DELEGATION

U.S. Senate
Senator Lisa Murkowski
Senator Mark Begich

U.S. House of Representatives
Congressman Don Young

ORGANIZATIONS/BUSINESSES

Alaska Geographic

Alaska Quiet Rights Coalition

Alaska Rainforest Campaign

Citizen's Advisory Commission on Federal Areas

National Wildlife Federation

Talkeetna Times

The Wilderness Society

Wilderness Watch

Wildlife Conservation Society

CONTRIBUTORS AND CONSULTANTS

DENALI NATIONAL PARK AND PRESERVE

Andrew Ackerman, Social Scientist
Paul Anderson, Superintendent
Bridget Borg, Biological Technician
Scott Burch, Concessions Management Specialist
Steve Carwile, Compliance Officer
Brad Ebel, West District Roads Supervisor
Kris Fister, Public Affairs Officer
Paula Homan, Environmental Protection Specialist
Philip Hooge, Assistant Superintendent, Resources, Science and Learning
Elwood Lynn, Assistant Superintendent, Operations
Tom Meier, Wildlife Biologist
Ingrid Nixon, Chief of Interpretation
Laura Philips, Ecologist
Melissa Snover, Ecologist
Tim Taylor, East District Roads Supervisor
Miriam Valentine, Chief of Planning
Joe Van Horn, Wilderness Program Coordinator

NATIONAL PARK SERVICE, DENVER SERVICE CENTER

Treff Alexander, Landscape Architect
Nell Blodgett, GIS Specialist
Kerri Cahill, Outdoor Recreation Planner
Greg Cody, NEPA Technical Specialist
June McMillen, Editor
Dan Niosi, Project Manager (former)
Stephan Nofield, Outdoor Recreation Planner
Leslie Peterson, Cultural Resources Specialist
Larissa Read, Project Manager
Steve Whissen, Cultural Resources Specialist
Paul Wharry, NEPA Technical Specialist
Don Wojcik, Natural Resources Specialist

CRIMSON PLANNING

Jennifer Morrissey, Recreation Planner

SAMMONS-DUTTON, LLC

Ron Dutton, Socioeconomist