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THE DENALI PARK ROAD

The effects of traffic volume and driver behavior on wildlife preservation and the visitor experience



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ON THE COVER

Visitors take in the grandeur of Mt. McKinley, Alaska, from Stoney Pass Overlook along the Denali Park Road. This edition's "In Focus" reports on investigations of vehicular road capacity and related issues for management of the park road.

ALASKA STOCK IMAGES/NATIONAL GEOGRAPHIC STOCK

In Focus: Denali Park Road

An integrated study of road capacity at Denali National Park

By Laura M. Phillips, Philip Hooge, and Thomas Meier

AT MORE THAN 6 MILLION ACRES (2 MILLION HA) IN SIZE, Denali National Park and Preserve (Denali) in Alaska has but one road: a narrow, low-speed route that takes a sinuous path over dramatic terrain in a pristine land (fig. 1). Extending 91 miles (146 km) from the park entrance to the old mining community of Kantishna where it dead-ends, the road traverses boreal forests and subarctic tundra, crosses rolling mountainsides and sheer cliffs, and meanders through scenic vistas and prime wildlife viewing areas. The first 15 miles (24 km) of the road are paved, after which it transitions to gravel.

The Denali Park Road gives visitors of all abilities the opportunity to travel by vehicle through, and access to, a vast, rugged wilderness. As they travel the road, visitors have the opportunity to observe wildlife in their natural habitat and to enjoy outstanding scenery (fig. 2). Currently, most visitors access Denali via the Denali Park Road on a tour or shuttle bus operated by a concessioner that is regulated by the National Park Service (NPS). Tour bus offerings include an eight-hour trip called the Tundra Wilderness Tour, primarily billed as a wildlife viewing opportunity that

Figure 1. Denali National Park and Preserve's 6 million acres straddle the Alaska Range in the middle of the state. One low-speed, gravel road provides access to the interior of the park, winding its way through boreal forest and tundra. Visitors have the opportunity to view dramatic scenery and wildlife in their natural habitat along the road, but will not encounter many facilities or amenities along the way.

Abstract

In 1986, managers at Denali National Park and Preserve in Alaska limited vehicle trips on the park road to 10,512 annually based on studies and observations that the number and behavior of vehicles may negatively affect wildlife behavior and the quality of the visitor experience. In 2006, vehicle use was approaching this limit and park managers began a process to comprehensively reevaluate the strategy for transporting people on the road. Managers enlisted an interdisciplinary team of scientists to conduct a series of studies over three years with the goal of assessing the effects of increased traffic volumes on important indicators of social and resource values and combining the results into a predictive traffic simulation model. The model enables park managers to integrate findings from wildlife behavior and visitor experience studies into planning documents and decisions that will guide transportation management in the park for years to come.

Key words: access, capacity, Denali National Park, resources, road, standards, visitor experience

travels to mile 53 or mile 66 on the Denali Park Road depending on weather conditions, and a three-hour trip called the Denali Natural History Tour, which focuses on cultural history and only travels to mile 17. Visitors may also ride the shuttle bus system, which is designed to provide general access into the park for visitors who do not desire a narrated tour. This bus system runs on a regular schedule to all major destinations along the park road, and provides access for viewing scenery and wildlife as well as transportation to visitor centers, campgrounds, and hiking locations. The road also provides circulation to public and administrative facilities and provides for reasonable access to private property. Private vehicle use is mainly limited to NPS staff living at field camps along the park road, Kantishna landowners accessing their



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property or transporting guests to one of the three lodges located in the area, and visitors staying at the Teklanika campground at mile 28. While the current transportation system allows various user groups to access the park using the Denali Park Road, the number of trips allocated to each group is highly regulated and restricted. Park officials have always recognized that the unpaved road was not designed to be a high-volume public thoroughfare and had a limited capacity for accommodating park visitation.

Limits to road access

The Denali Park Road was completed to Kantishna in 1938 and is the only publicly accessible road in the national park. Initially, use of the road was limited because of low park visitation. Prior to 1957, when the Denali Highway was completed, connecting the park entrance to Alaska's Richardson Highway, visitors had to travel by train or plane to reach the park and park visitation rarely exceeded 7,000 people annually. Because visitors arrived without their own means of transportation, private concessioners provided tours along the park road using horses and cars. Completion of Alaska's Denali Highway gave motorists easier access to Denali National Park, and vehicle traffic on the Denali Park Road doubled as a result. To accommodate more private vehicles, the Denali Park Road was upgraded and widened in the 1960s. Opposition to the improvements was widespread. Adolph Murie, a prominent wildlife biologist, opposed the changes and stated that the "drastic rebuilding of the old road shows an obsessive regard for superhighway standards and a lack of appreciation for the spirit of this northern wilderness" (Murie 1965). Park managers were sympathetic to the public outcry, and the "wilderness feel" of a trip on the park road has been considered by management an intrinsic part of the visitor experience that should be maintained.

In 1971, the opening of another important Alaska highway—the George Parks Highway (Alaska Route 3)—greatly shortened the

NPS/JOHN HOURDOS



Figure 2. Buses transporting visitors on the road in Denali National Park stop to watch a caribou. Seeing large mammals along the road is a highlight of a trip to Denali for most visitors.

driving time between Alaska's main population centers of Anchorage and Fairbanks, and provided direct access to Denali National Park. Predicting another dramatic increase in automobile traffic to the park, officials closed most of the Denali Park Road to private vehicles and implemented a mandatory public transit system to provide public access beyond the Savage Check Station at mile 15 (fig. 3, next page). Private vehicles would be allowed access through a permitting system, and buses would transport visitors throughout the park, giving them access to park lodging, trailheads, and campgrounds. Initially, this mandatory bus system was free to the public and acted only as a means to shuttle visitors to destinations along the road. National Park Service director George Hartzog proclaimed, "we have reached the end of this cycle of more roads and more trails . . . and . . . have got to look to other means of access" (Norris 2006). The school buses that began transporting visitors into the park in 1972 remain an iconic symbol of the Denali Park Road today (see figs. 2 and 3).

Publication of the Denali General Management Plan (U.S. Department of Interior 1986) in 1986 confirmed the advantages of a limited-access transportation system for the park road in providing wildlife viewing opportunities while preserving wildlife and a high-quality visitor experience. The plan established a maximum limit of 10,512 vehicle trips per season beyond mile 15, the restricted section of the road. The decision to limit traffic was based on NPS studies, general observations, and public input that the number and type of vehicles on the Denali Park Road in 1984 were having negative impacts on wildlife behavior and the visitor experience (Singer and Beattie 1986). The vehicle limit was established using 1984 use levels as a base and allowing a maximum 20% increase in shuttle and tour bus traffic while decreas-

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NPS/LAURA PHILLIPS

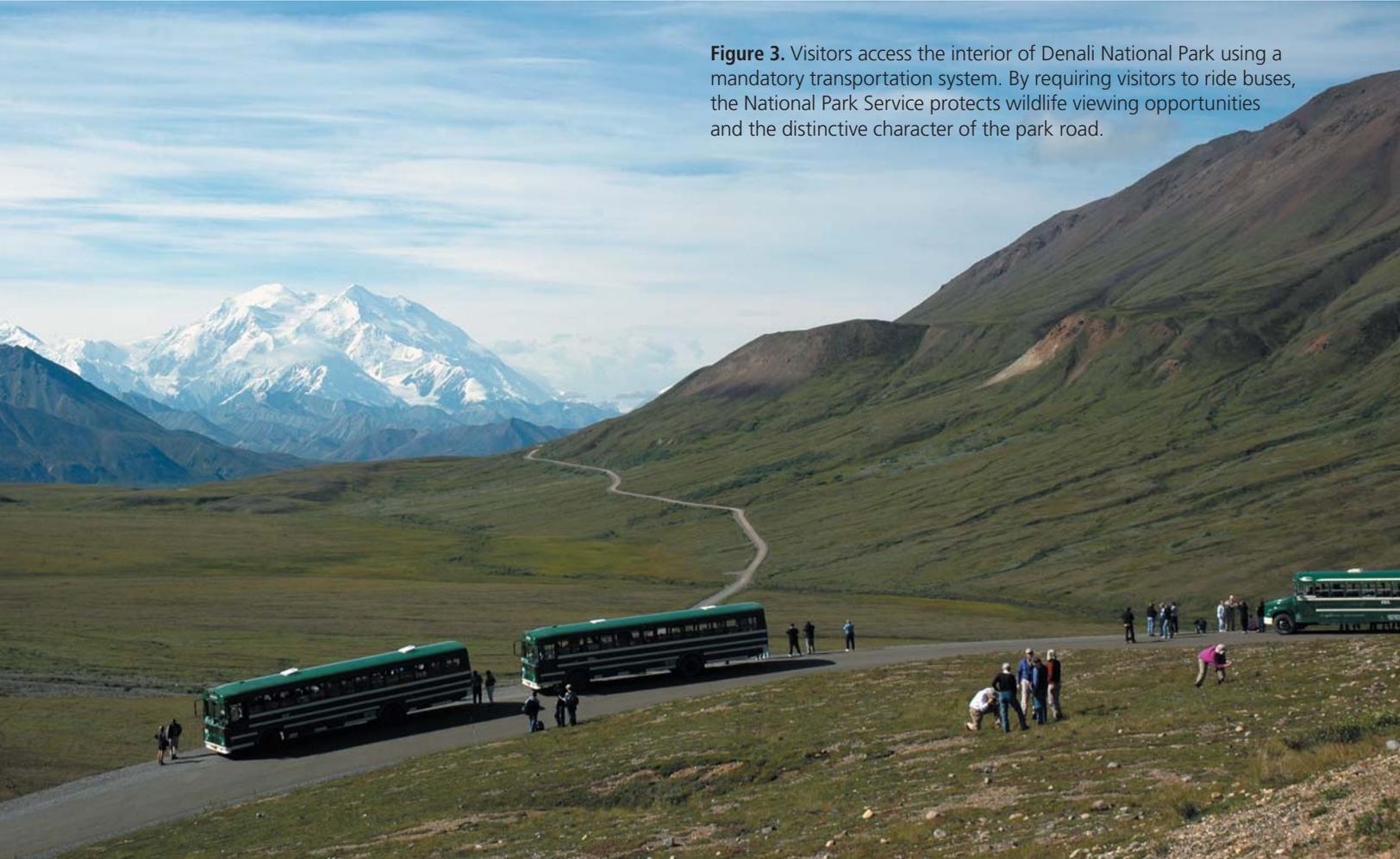


Figure 3. Visitors access the interior of Denali National Park using a mandatory transportation system. By requiring visitors to ride buses, the National Park Service protects wildlife viewing opportunities and the distinctive character of the park road.

ing private vehicles that were found to have a disproportionate impact on wildlife (Singer and Beattie 1986).

Park managers further described desired future conditions for the park road in the 1997 Entrance Area and Road Corridor Development Concept Plan (Entrance Area Plan; U.S. Department of Interior 1997) by defining management zones for the park. The gravel portions of the Denali Park Road were included in wildlife viewing subzones 1 and 2, the primary purposes of which include wildlife and scenery viewing. The plan also specified that visitor use would be proactively managed by applying the Visitor Experience and Resource Protection (VERP; National Park Service 1997) framework. Managers realized that providing a quality experience and protecting park resources required specific desired conditions and key impact indicators to be identified, and desired park conditions to be compared with existing ones.

The Entrance Area Plan also redefined the allocation of vehicle trips by user group on the Denali Park Road within the 10,512 limit. Only minor changes have been made by management to

vehicle trip allocation since 1997. Currently, up to 30 Tundra Wilderness Tours, 23 Denali Natural History Tours, and 36 shuttle buses are allowed to travel the park road each day. During peak visitation in July, the park concessioner frequently runs a full allocation of tour buses with every seat filled.

Need for integrated study approach

When the mandatory transportation system in Denali was implemented in 1972, it was the only regulatory system for private vehicles and buses on roads in a U.S. national park. The National Park Service conducted a number of surveys to evaluate public attitudes toward restrictions placed on road access (Harrison 1975; Singer and Beattie 1986; Miller and Wright 1998). Generally, visitors have had favorable opinions of traffic limits, and listed protection of wildlife, enhancement of wildlife viewing opportunities, and reduction in traffic congestion on the road as factors contributing to their satisfaction with the policy. However, since those studies were completed, visitors and stakeholders have

Denali Park Road Traffic Simulation Model

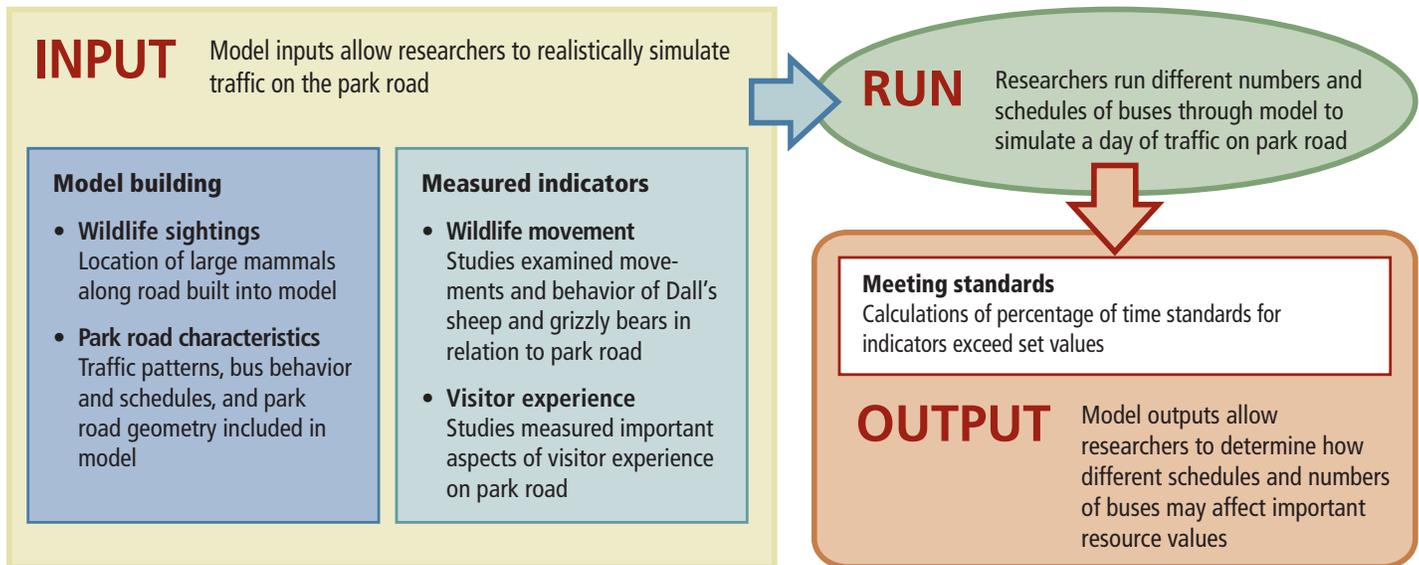


Figure 4. A simulation model integrates results from social and biological studies with traffic patterns to determine potential impacts of alternative transportation strategies on important visitor experience and wildlife resource indicators.

expressed concerns about the regulatory policy. They explained that the policy did not provide for growth in park visitation or flexibility to meet changing needs of visitors, bus operators, and park resources; others felt that it did not adequately protect park resources or provide adequate opportunities for visitors to choose park experiences that address their personal interests. Park managers note that the transportation system for the Denali Park Road has never been comprehensively evaluated and that the question of whether Denali is providing the best system possible for all users should be answered. Visitation at Denali is projected to increase and, along with it, the demand to travel the Denali Park Road. Managers also wonder whether changes in demographics and interests of visitors are being met by the current system.

These issues have biological, sociological, and physical elements that require better understanding. Thus, in 2006, more than 34 years after the first limits were imposed, managers decided to comprehensively reevaluate road use limits in relation to concerns for wildlife well-being and preservation of the high-quality experience associated with touring the park road. Managers understood the necessity of designing a series of interdisciplinary studies and integrating their results in order to define potential solutions to stakeholder concerns and to identify effects of various alternative transportation scenarios. They enlisted an interdisciplinary team of scientists to conduct three studies over three

years. The goal of the research is to assess the effects of changes in traffic volume and patterns on important indicators of social and resource values by combining the results into a predictive model of detailed road traffic scenarios (fig. 4).

Three studies

One of these studies was aimed at defining important components of visitor experience. Investigators employed qualitative interviews and surveys of park road users to identify and measure experiential indicators and standards of quality in a more comprehensive fashion than in the past. As the following article on pages 33–41 by Robert Manning and Jeffrey Hallo explains, the standards for selected indicators could then be applied to predictive modeling to assess impacts on visitor experience of alternative management scenarios.

A second study investigated possible links between traffic on the Denali Park Road and the behavior of large mammals. The park road provides a unique opportunity for visitors to view wildlife by accessing remote areas where animals remain tolerant of some human disturbance. Though previous research had suggested possible negative effects of traffic on wildlife, it was based on observational studies that only considered wildlife movements within the road corridor and did not attempt to directly link

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traffic volume to wildlife behavior. Hence, investigators Laura Phillips, Richard Mace, and Thomas Meier designed a more comprehensive study of traffic-wildlife interactions to determine potential links between traffic numbers and wildlife movements. This research is described on pages 42–47.

Finally, Ted Morris, John Hourdos, Max Donath, and Laura Phillips looked at the logistical constraints associated with traffic patterns on the park road. Their article on pages 48–57 concludes this segment of *Park Science* focused on the Denali Park Road. This report describes development and application of a traffic simulation model to analyze the effects of current and increased traffic volume and changes in traffic patterns on visitor experience and wildlife protection. Park planners and managers are now using this model to test the efficacy of alternative management scenarios in protecting park wildlife and the quality of the visitor experience.

Conclusion

Understanding the relationships among experiential values, biological resources, and human use is vital to formulating and implementing management policy in national parks. While the VERP framework has been used to address capacity issues in many parks, few applications have employed an interdisciplinary program of research to devise and test alternative management approaches. The following articles outline our approach to evaluating a complex management issue and to testing multiple alternative solutions. The results of these integrated studies will inform development of a new vehicle management plan aimed at addressing increasing recreation demand while ensuring a high-quality experience for visitors, protecting resource values, and maintaining the unique character of the Denali Park Road.

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