

*Over 500,000 miles of roads have been built on America's public lands; enough to circle the earth 20 times. In his new book, No Place Distant, David Havlick traces the history of roads on public lands and illuminates the many challenges that roads and motorized recreation pose to the integrity of the public lands landscape. In the following adapted excerpt, Havlick describes the different approaches to road construction taken by the U.S. Forest Service and National Park Service during the early part of the twentieth century.*

# BEHIND THE WHEEL

## A LOOK BACK AT PUBLIC LAND ROADS

*In the last analysis, forestry and lumbering, like mining and farming, are problems of transportation.*

—Dr. Carl Alwin Schenck, 1951

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**W**hen the first car rolled out of the Ford Motor Company's Detroit plant in 1903, the public lands we know today were but a twinkle in the nation's eyes. The U.S. Forest Service was two years shy of its birth, the National Park Service would arrive in thirteen years, and

the other major land managing agencies would not emerge for nearly a half-century. But even then the public lands had roads.

Long before the advent of the automobile, Americans relied on roads for travel, whether by foot, by horse, by cart, or by bicycle. Roads relieved the rural American's sense of isolation and made for easier, faster travel than ever before. Roads could be useful for moving supplies and mobilizing troops as the nation pushed its boundaries westward. Roads linked neighbors and small towns, creating stronger communities and greater prosperity. Even without cars, eighteenth and nineteenth century Americans thought good roads were a great thing.

On public lands, roads came for many reasons. Many national parks arrived with initial support from railroads. As tourists abandoned the trains for cars, the National Park Service also shifted

its attention to court the automobile. The Forest Service wanted to bring visitors and popular support to the nation's forests, but also wanted roads to transport timber and fight fires.

In the West, far from the halls of power, roads and public lands developed an early affinity for each other. In 1883, eleven years after the creation of Yellowstone National Park, army engineers began the first systematic road construction in what would become the flagship of America's public lands. In just over two decades, Yellowstone would feature three hundred miles of road looping through some of the most remote reaches of northwest Wyoming.<sup>1</sup> Early national parks supporters calculated that in order to create a constituency for land reserves, people needed to have easy access. Though it would take several decades for the horse and railroad to give way to the automobile, roads were still

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**BY DAVID G. HAVLICK**



*Automobile passing through the arch at the northern entrance of Yellowstone National Park, n.d. Inscribed on the arch is “For the Benefit and Enjoyment of the People.”*

the key to bringing visitors. Whether motivated by easier rural access to goods and services, opening the hinterlands to extraction, or simply to create routes for touring motorists, Americans have found reasons to build roads.

In 1900, Americans owned 8,000 automobiles. Thirty years later cars and trucks numbered 40 million. At the close of the twentieth century, Americans had more than 200 million registered automobiles and continued to buy another 15 million each year.<sup>2</sup> The demand for roads has not diminished. At a glance, it makes perfect sense that with the number of cars and drivers increasing, road miles should too. The history of road building on public lands, however, involved more than just cars and roads.

#### LAND MANAGEMENT AGENCIES AND ROADS PROGRAMS: UNITED AT BIRTH

For reasons of both technology and culture, the modern era of federal road programs meshed closely with the genesis of the two most prominent land management agencies. In 1905, Congress created the Bureau of Public Roads and the U.S. Forest Service. Little more than a decade later, 1916 saw the passage of the National Park Service Act and the inaugural Federal Highway Act. Virtually united at birth, roads and these public lands have in many ways been characterized—for better and for worse—by their common bond ever since.

Beginning with Yellowstone in 1872, Congress created national parks most famously in response to tawdry commercial developments springing up in scenic natural areas across the country.<sup>3</sup> Along with the constituencies for protection, national parks also

drew the interest of corporations. The Northern Pacific Railroad Company planned a route across the Dakota and Montana Territories and wanted to attract tourists to the Yellowstone region. To promote this, the Northern Pacific supported the 1870 Washburn-Doane Expedition from which the Yellowstone National Park idea first emerged. The next year, the Northern Pacific sponsored artist Thomas Moran's place in the Hayden Expedition, whose paintings and reports led to the successful passage of the Yellowstone legislation in Congress. Much as its promoters hoped, Yellowstone's designation as a national park created an attraction for hundreds of thousands of visitors in the years ahead.

From the Yellowstone Park Act of 1872 to the National Park Act of 1916 and on to the present, national parks have been guided by what sounds like a challenging dual mission: “to *conserve* the scenery and the natural and historic objects and the wild life...as will leave them unimpaired *for the enjoyment* of future generations” (emphasis added). With that charge, Congress established the National Park Service both to preserve lands and make them available for human use. The disparate prongs of this mission statement have created a history of national park planning that fosters tourism while at the same time preserves scenic beauty. For its first two decades the National Park Service was staffed predominantly by engineers and landscape architects, with wildlife biologists, for example, notably absent.<sup>4</sup> The general agency philosophy concerning roads was that they should be built, but they should be built sparingly and handsomely.

Though the National Park Service had ample incentive to build roads that offered scenic opportunities to park visitors, lurking in the background of the early planning and park developments was

the shadow of a competing senior agency: the U.S. Forest Service. Whereas the national park system limped into place piece by piece, with each park requiring its own legislative act by Congress, the Forest Service strode into creation with 63 million acres of forest reserves already in its care. Thanks in large part to President Theodore Roosevelt's fondness for conservation and his power, at the time, to designate forest reserves by proclamation, the national forest system swelled to more than 151 million acres before the National Park Service even existed.

With only fourteen national parks designated on about five million acres in 1916, the Park Service might have been understandably daunted by its agency counterpart. The surest way to secure itself bureaucratic tenure was to create a large constituency of public support. At the end of World War I, with an expanding leisure class, the patriotic call to, "See America First," and a newly affordable and widely available Ford Model T, Park Service planners knew right where to turn: roads and motor tourists.

The Forest Service took to roads a bit more slowly. Recreational tourism was tangential, at best, to the agency's mission of securing favorable water flow and providing a continuous supply of timber to a growing nation. Staffed primarily by trained foresters, the Forest Service dedicated itself to a management philosophy of sustainably using the natural resources of the country's forests. A handful of roads already existed on national forest lands at the time of their designations—and the agency built or improved more roads each year—but in its early days the Forest Service generally lacked the incentive to build a great number of smooth, easily traveled roads. In the agency's view, roads served utilitarian purposes and little more. It would build roads on a limited basis, as foresters needed them to access timber, fight fires, or to help manage sprawling administrative units.

By the early 1920s, however, motorized travelers had so overwhelmed roadsides and private lands that car camping tourists were spilling onto the national forests. In 1912, one dozen stalwart motorists managed to drive across the country; by 1921, transcontinental motor trips numbered 20,000. By 1922, the *New York Times* estimated that of the 10.8 million cars registered in

the United States, five million would be used for camping.<sup>5</sup> The Forest Service soon realized that recreational demand of its lands required some response.

In 1920, Forest Service chief Henry S. Graves published an article in *American Forestry* entitled, "A Crisis in National Recreation." Written at the close of his tenure with the Forest Service, Graves's article partially reflected his agency's growing concern over the newly-formed National Park Service. The crisis he identified, though, was the exodus of urban automobile tourists pouring into national forests and parks. To Graves, the subsequent commercialization of national park lands—and by extension, the blurring of lines between parks and national forest lands—presented an alarming trend. In Graves's view, national forests were the proper storehouse for the country's natural resources and recreation was becoming just that: a valuable resource. Five million car-camping tourists represented money and power too great to ignore. National parks, on the other hand, ought to be kept apart from commercial exploitation. In other words, national forests should be used, whether for recreation or timber harvest, and national park lands should be preserved.

Regardless of Graves's concern as a "friend of the National Park System," both agencies would find cause for further roadbuilding on their lands. The Forest Service could capitalize on the recreation resource, while the Park Service wanted to boost its constituency and provide roads for the enjoyment of visitors.

Graves's article is noteworthy for more than its whispers of agency rivalry. It represents one of the first acknowledgments that the Forest Service would concern itself with recreation. And significantly, according to Graves, recreation was intimately linked with roads: "...recreation has an important place in the demand for a large program of road improvement and extension." Later in the same *American Forestry* article, Graves wrote, "Roadbuilding is an important feature of the development of our public forests and parks for recreation."<sup>6</sup>

Several things happened close on the heels of Graves's 1920 article to reveal a growing interest in recreation on public lands. First, Congress appropriated more money for forest roads, and the Forest Service responded with a more directed road building program than it ever had before. The 1916 Highway Act had directed \$10 million to the Forest Service for road building over the next ten years. In 1921, Congress added \$5.5 million for "forest development" roads, such as those used for fire control and administrative use, and \$9.5 million for "forest highways" to supplement state road systems. With the passage of the Post Office Appropriations Act in 1919, Congress also granted \$9 million to develop and administer roads on national forest lands. The latter amount, prompted originally by rural free delivery mail service and the desire to connect rural lands, effectively shifted a portion of road development out of the farmlands and into the woods. In 1916 there were only 2,795 miles of road on national forest lands; by 1939 the Forest Service reported nearly 140,000 miles.<sup>7</sup> Within a year of Graves's article, the agency's revised operations manual included recreation as a value of the Forests to be managed in coordination with timber, water, and forage.<sup>8</sup>

## FOREST LANDS WITHOUT ROADS

The new crush of motor tourists and roads spurred Forest Service employees Aldo Leopold and Arthur Carhart to press for a new



FOREST HISTORY SOCIETY COLLECTION (USIS #178416)

*Early national forest roads served primarily to provide access to timber, fight fires, or perform other management duties. With the advent of inexpensive automobiles, recreational demands for roads quickly added to the list of uses.*





NPS/HPC

*Visitors with mobile home in Yellowstone National Park, 1925. By the mid-1920s, motorists had custom-built the first prototype mobile homes, and industrial production was not far behind. By the mid-1930s, the mobile home industry was one of the fastest growing in the United States.*

type of land classification, which Leopold called “wilderness.” The simmering inter-agency rivalry may have played a role in the Forest Service’s willingness to move in a new direction for managing lands. By designating wilderness and primitive areas, the Forest Service could take land preservation a step further than the National Park Service and preserve lands without the trappings of commercial development and penetrating road systems that had already grown common in national parks.<sup>9</sup> But both Leopold and Carhart made it clear that the threat of roads and motorized recreation, not agency competition, lay at the heart of what moved them to protect lands in a primitive, undeveloped condition.<sup>10</sup>

Carhart’s interest in a different and less intrusive management of forest lands came most directly from his concern over shoreline development at Trapper’s Lake, high in the mountains of western Colorado. Since 1915, the Term Permit Act had allowed recreational developments on national forest lands. These permits were typically operated under 30-year leases and most commonly came in the form of lakeside lodges, cabins, and developed camps. What troubled Carhart about the arrangement, though, was that public lands were being developed and built upon,

rendered into commercial goods, and effectively removed from free public access.<sup>11</sup> Carhart favored leaving lands, such as Trapper’s Lake, undeveloped in a primitive condition as a means of protecting public access equitably. Thus lands would remain a public good instead of being parceled out to the privileged, permitted few and their paying clients.

Leopold, meanwhile, came to a similar position—that certain lands should be protected from roading and development—but from a different slant. To Leopold in the 1920s, as with many conservationists today, wild undeveloped lands offered an antidote to the consumerism of outdoor recreationists and society at large. Whereas Carhart spoke against development in order to ensure equal access to public lands, Leopold sought more simply to protect lands from the menace of “automobility;” that is, motorized access and the roads and crowds that invariably accompanied it.<sup>12</sup>

In 1924, largely at Leopold’s urging, the Forest Service established the Gila in New Mexico as the nation’s first designated wilderness area. Five years later, the agency enacted a broader measure, called the L-20 Regulation, to protect certain lands within the national forests. The L-20 Regulation set a policy to designate Natural Areas, for scientific and educational purposes; Experimental

Forests and Ranges, for long-term research unimpeded by other management goals; and Primitive Areas “to maintain primitive conditions of transportation, subsistence, habitation, and environment to the fullest degree compatible with the highest public use.”<sup>13</sup>

During the next ten years, the Forest Service established 75 Primitive Areas and two Canoe Areas on more than 14 million acres, but not all agency officials supported the designations. An April 25, 1932, memo from the agency’s Washington, D.C. office noted, “Since most of the Branch chiefs apparently disapprove the primitive area policy or its application, I should like to have the subject discussed at the next Service Committee meeting, to determine wherein the differences of opinion lie...”<sup>14</sup> Forest Service policy made it clear that lands classified as primitive areas were still subject to management activities, including logging or roadbuilding, as determined by the long-standing agency philosophy to manage for the “highest use” of the forest resources.

Despite the reservations expressed by branch chiefs and others in the agency, within a few years the Forest Service updated and strengthened its administrative policies to protect lands from roads and motorized access. Written by Forest Service recreation planner and wilderness advocate Bob Marshall, the U-Regulations replaced the L-20 Regulation in 1939 and added Wilderness and

Wild Area designations that included prohibitions against roads, motorized transportation, commercial timber harvest, and special permits for lodges, summer cabins, or other facilities. Although the new regulations did not add much to the protected land base on national forests, the U-Regulations granted more security to wilderness planning—only the Secretary of Agriculture could modify Wilderness Area designations—and effectively kept 14.5 million acres of forest land free of roads and motor vehicles for the next twenty-five years.

## NATIONAL PARK ROADS AND TOURISM

At the time of the stock market crash of 1929, the National Park Service managed a total of 1,298 miles of road and more than three times that many miles of trail. During the 1920s, Park Service Director Stephen Mather occasionally lashed out at the U.S. Forest Service for its “commercial exploitation of natural resources.” At the same time, Mather pressed for hotel and road development in the national parks to provide for visitor services and enjoyment. Writing in 1920, Mather declared “the road problem,” which he defined as the need for more and better roads, “one of the most important issues before the [Park] Service.”<sup>15</sup>



FOREST HISTORY SOCIETY PHOTO COLLECTION (USFS #370908)

*Increasing recreation pressure on the national forests during the 1920s and 1930s prompted the L-20 and U-Regulations that established wilderness and wild areas on the national forests several decades before the Wilderness Act of 1964. This photo shows car camping in July 1938 at the Grout Bay Campsite on the San Bernadino National Forest, California. The campsite was developed under a mature Jeffrey pine forest that continued to serve as winter habitat for bald eagles.*



In fact, Mather's words during this time highlight the challenge of trying to balance the Park Service's directives of preservation and tourism. Differing somewhat from his contemporaries Leopold and Carhart in the Forest Service, Stephen Mather and the National Park Service stopped short of labeling roads and associated developments a means of ruining wild country. Rather, roads and hotels could be essential services that enabled Americans to appreciate, value, and visit the natural beauty of the national parks.

With that understood, Mather and others described a very specific and limited role for roads in national parks: one major road should bring tourists to the core of each large park, but roads should not be overbuilt or overabundant.<sup>16</sup> In his 1923 Report of the Director, Mather wrote, "We must guard against the intrusion of roads into sections [of parks] that should forever be kept for quiet contemplation and accessible only by horseback or hiking."<sup>17</sup>

In 1927, Congress granted the Park Service \$51 million to improve and build roads over a ten-year span. At about the same time, though, a gathering of national park superintendents agreed that they should restrict themselves to a ratio of one mile of road to every ten miles of trail in order to avoid the "cheapening effect of easy accessibility" from auto tourists.<sup>18</sup>

One striking exception to the National Park Service's philosophy of limiting road access appeared at about the time of the Depression and its New Deal programs: the Park Service called it a "Parkway." Shortly after cars became affordable to many Americans, the New Deal established a massive labor force for federally-funded projects. Between 1933 and 1940, the federal government poured \$1.8 billion into road construction.<sup>19</sup> The New Deal's Civilian Conservation Corps crews gave a natural jumpstart to the National Park Service's two decades of building national parkways.

These ribbons of national park roads—the George Washington, Blue Ridge, Natchez Trace and others—were typically identified, created, and built solely to accommodate motor tourists. Designated as elongated parks, national parkways such as the Blue Ridge in some aspects epitomize the roaded extreme of American public lands: a corridor of asphalt buffered by 1000 feet of natural, forested right-of-way. Understandably, the parkways came under attack as a departure from Park Service ideals. The National Parks Association, for instance, complained in an article titled, "Park Service Leader Abandons National Park Standards," that "Some persons even go so far as to assert that [the agency's] proper function is to stimulate and direct recreational travel throughout the country."<sup>20</sup>

The overwhelming popularity of national parkways reflects the powerful role that automobiles and roads have played in the development of American culture and its public lands. When parts of Skyline Drive in Shenandoah National Park opened in Virginia in 1934, nearly 50,000 drivers cruised its asphalt curves in the first five weeks.<sup>21</sup> To this day, the national parkways still rank high on the list of the most visited units of the National Park System: the Blue Ridge Parkway notches first place with more than 18 million visits each year, while the Natchez Trace and George Washington Parkways both appear in the top ten with nearly six million visitors annually. By comparison, Yosemite National Park in California, although infamous among the large scenic parks for its summer hordes, attracts fewer than four million visitors a year.

## THE CIVILIAN CONSERVATION CORPS, 1933–1942

Along with parkways, the Depression and its subsequent New Deal programs brought other threats that would alarm people like Aldo Leopold and chip away at the roadless forest lands that he prized. Faced with massive unemployment and widespread depression, President Franklin Roosevelt sent Americans to work "in nature" for their economic and societal therapy.<sup>22</sup> The most visible result of this push, the Civilian Conservation Corps (CCC), was active for only ten years, from 1933–1942. During that time, however, the CCC managed to pour more than three million laborers into workcamps on federal and state lands. By some estimates, the CCC crews built in ten years what otherwise would have taken fifty to accomplish. By 1942, CCC crews had constructed 126,000 miles of roads and "truck trails" on public lands.<sup>23</sup>



NARA 95-G-290289

*Civilian Conservation Corps crew with bulldozers, Modoc National Forest, California, 1934. CCC workers unleashed on the public lands during the New Deal did a significant amount of road building, raising concerns among wilderness advocates.*

Of these latter, some commentators could not keep their criticisms quiet. In one of her many pamphlets, Rosalie Edge noted, "C.C.C. camps are established in hundreds in the National Forests and the Forests are being honeycombed with roads. Roads in the Forests, if not surfaced with asphalt, are called 'truck trails.' The word trail presents to the mind a picture of a narrow woodland path wending its way beneath the trees. Actually, the so-called trail is a graded swath, usually following a stream up a narrow valley, over which may be transported machinery to cut huge trees. Surely trail is a misnomer for a road wide enough for the motor truck."<sup>24</sup>

In the Forest Service's annual report for 1942, the Chief estimated that CCC workers contributed some 730,000 "man years" to national forests over the course of the program. With America's entry into World War II, enrollment in the CCC quickly dissipated. In 1942 it was terminated by Congress. The roads, bridges, fire trails and other major works of the CCC, however, would remain for years to come. The CCC effort worked wonders for the economy and morale of a struggling nation; it also left its mark on an increasingly fractured landscape.



NARA 79-G-5-F-769

*Dedication of the Going-to-the-Sun Highway, Logan Pass, Glacier National Park, July 15, 1933. Going-to-the-Sun Highway, which crossed Glacier from east to west, was an engineering marvel and one of the most important new park roads of the late 1920s and early 1930s. It was a product of increased funding for park roads that began in the mid 1920s and climaxed during the Depression and the New Deal.*

#### FOREST ROADS: GETTING THE WOOD OUT, 1946–1960

Although recreational visits to national parks surged after the Second World War, from 11.7 million visits in 1945 to 25.5 million in 1947 and nearly 50 million by 1954, few new roads were built in the national parks in the latter half of the twentieth century. The Park Service focused, instead, on road maintenance and improvements rather than major new construction.

Conversely, after the Second World War the Forest Service finally kicked its roadbuilding machinery into high gear. As production dwindled from heavily cutover private timberlands, the wood products industry increasingly turned to national forests to feed the demand of a booming nation. Road miles on the national forests doubled in the two decades following World War II, with an increase of 100,000 miles from 1946 to 1969.<sup>25</sup> The vast majority of these roads were built to access timber.

In 1946, former U.S. Forest Service chief William Greeley wrote that the logging industry was operating at only 60 percent of its potential on national forests in the Pacific Northwest for one basic reason: limited road access.<sup>26</sup> Although at the time Greeley was working for the West Coast Lumberman's Association and was no longer affiliated with the Forest Service, his message still carried considerable weight with Congress. Furthermore, the word from the agency was almost verbatim.

That same year, 1946, Ira J. Mason was head of the Forest Service's timber operations. Mason proposed a \$260 million, 26,000-mile roadbuilding program in order to access timber.<sup>27</sup> With the price of wood on the rise, demand also shot up with a burst of post-war construction. Forest Service timber sale receipts increased more than tenfold from 1946 to 1956. In order to get the wood out of the forests, the Forest Service needed roads.

Even with thousands of miles of new roads, by 1952 Forest Service chief Richard McArdle determined road access was still limiting his agency's timber harvest to 70 percent below its potential. In his annual report that year, McArdle wrote, "Millions of acres of wild forest land must await an adequate road system before they will return their full worth in forest products and growing capacity."<sup>28</sup> To respond to this, the Forest Service requested \$112 million from Congress for road construction. The agency received more than \$40 million for roadbuilding within four years of its request. Not quite satisfied, chief McArdle returned to the Senate in 1956 to reiterate that proper forest management was impossible without an adequate transportation system.<sup>29</sup>

In 1957, the assistant chief of the Forest Service testified to a congressional committee that his agency was building approximately 2,800 miles of new roads each year in order to meet the Nation's anticipated demand.<sup>30</sup> The Forest Service's roadbuilding boom was in full swing.



## NATIONAL FOREST ROADS, 1960 TO PRESENT

Of all the road miles on public lands in the United States today, four-fifths exist on the national forests. The U.S. Forest Service is, far and away, the top roadbuilding agency in American history. Increasingly since the 1970s, the public and Congress have questioned the agency's management of the nation's forests. As the Forest Service's roadbuilding and timber programs surged during the 1950s, the timber industry and a growing environmental movement began to clamor for very different types of agency response: the former for increased access and harvest, the latter for more preservation and protection.<sup>31</sup>

In the 1960s, with laws such as the Multiple Use Sustained Yield Act and the Wilderness Act, Congress clarified the range of uses that the Forest Service needed to consider, namely: recreation, grazing, wildlife, timber, water, and wilderness. In 1969, with passage of the National Environmental Policy Act, Congress also provided an explicit process for public involvement in land management decisions.

With timber sales, roads and clearcuts still increasing through the 1960s on the national forests, Congress acted again and in

1976 passed the National Forest Management Act. In addition to refining the agency's local planning process and setting limitations on timber harvest, the law included important language regarding forest roads. Among these, the Forest Service was required to document roads in a forest transportation plan, keep an accurate inventory of roads, and reestablish vegetative cover on any temporary road within ten years.<sup>32</sup> As these and other prescriptions made their way into forest planning documents in the years ahead, road-fighting conservationists would turn to them to limit road densities in wildlife habitat areas, demand road closure and obliteration programs, and monitor agency compliance with federal law.

Despite increased public concern for conservation and a stronger legislative hand in directing Forest Service activities, the 1970s and '80s witnessed a doubling of national forest road miles at a pace nearly equal to that of the previous two decades. By 1985, the national forests had more than 340,000 miles of roads, and new construction approached a rate of 10,000 miles per year.<sup>33</sup>

By the 1980s, the Forest Service began to openly recognize that public sentiment was no longer solidly behind aggressive logging and roadbuilding programs. Though agency publications still



FOREST HISTORY SOCIETY PHOTO COLLECTION.

*Roads on national forests increased by more than 100,000 miles from 1946–1969 as the post-World War II housing boom spurred demand for wood products. Caterpillar Diesel D4 Tractor with LaPlant-Choate trailbuilder, 1940.*





*During the 1970s, road use on the national forests was dominated by logging operations and recreational visitors. By the late 1990s, logging would represent just 0.5 % of all use on national forest roads. This photo, on the Cherokee National Forest in Tennessee, shows wood being hauled out as recreationists drive a forest road into South Holston Reservoir in 1962.*

touted forest roads as essential for uses that ranged from driving for pleasure to logging to outdoor recreation, they also acknowledged road-related problems including soil erosion, aquatic disturbances, cost, and impacts to sensitive wildlife species and habitats.<sup>34</sup> The Forest Service and timber purchasers continued to build thousands of miles of new road each year, but the agency also began road obliteration programs and watershed restoration projects in an effort to reduce some of the past damage.

In certain regions, such as the northern Rockies and Pacific Northwest, threatened or endangered species management led to specific restrictions on the number and location of roads in critical habitat areas. Since certain species, including grizzly bear and elk, are known to avoid roads or suffer population declines when roads exceed a particular density (usually measured as the linear miles of road per square mile of land area), many Forests adopted standards that allow roads only up to a certain threshold.

In 1997, agency rhetoric against roadbuilding strengthened into a moratorium against new roadbuilding in most roadless areas and the development of a new roads policy. The Forest Service also acknowledged that thousands of miles of road existed

on national forest lands that they had not previously identified.<sup>35</sup> While these measures were broadly perceived as a show of greater agency concern over the proliferation of roads, road construction and reconstruction continued in many areas.

#### TRANSPORTATION MANAGEMENT IN A NEW MILLENNIUM

What we now face in the United States is an array of public lands plagued by many roads we do not and cannot use, inadequate monitoring and maintenance budgets, and a subsequent increase in ecological impacts. Unfortunately, most public land roads do not rest passively on the landscape, even as they receive little or no use. The Forest Service estimates that 80 percent of its road use occurs on just 20 percent of its roads, and logging activity now accounts for just 0.5 percent of all national forest road use.<sup>36</sup> Yet many roads, even without any use, deliver sediment into rivers and lakes, trigger landslides, and affect fisheries. Other roads fragment habitat, disrupt terrestrial animal movements, and offer corridors for exotic plant and animal invasions.

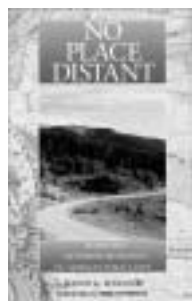
Most public land agencies have a history of struggling to keep abreast of their road miles and maintenance. Through the 1930s, '40s and '50s, Forest Service reports reflected an inability to keep track of either road miles or their condition. The 1935 *Report of the Chief*, for example, listed a total of 120,948 miles of road, but also noted that 31,796 miles were, "nonexisting," and 35,774 miles more were considered of "unsatisfactory standard." As recently as 1999, the Federal Highway Administration rated 70–80 percent of public land roads in "fair" or "poor" condition.<sup>37</sup> National park roads have required almost continuous maintenance and reconstruction from the time of the first wagon tracks into Yellowstone.

With the abundance of roads traversing our nation's public lands, we have gradually developed a collective expectation not of careful stewardship, but of easy and immediate access. At the beginning of the twenty-first century, "transportation management" now sits at the top of many agencies' list of priorities. Whether built to carry tourists to scenic attractions, to access and extract natural resources, to decrease travel times or distances, or to accommodate recreational or management activities, roads permeate the American landscape. With many federal lands long prized as reserves spared from the rapid development of private lands, we must now realize that even our sanctuaries have become splintered. There is no longer a single place in the continental United States more than twenty miles from a road.<sup>38</sup>

In less than a century we have converted a continent with relatively few roads into a continent characterized by them. Today, relatively new fields such as restoration ecology and road removal may hold promise, both for changes they can bring to the land and for jobs they can bring to local communities. The challenges during the next century include not only road maintenance and management, but also broader changes in how people approach and value public lands. As federal land agencies struggle to manage their sprawling networks of roads, the future lies largely in the hands and values of the people who are in so many ways behind the wheel: the American public. □

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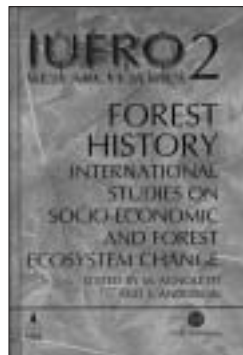
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  25. Harold K. Steen, *The U.S. Forest Service: A History*, 1976, Seattle: University of Washington Press, p. 314; *Roads in the National Forests*, p. 7. The U.S. Department of Agriculture's annual *Report of the Chief* indicates 100,414 road miles on national forests in 1946 and 199,042 miles in 1969. Note that in earlier Forest Service reports, such as 1939's figure of 140,000 miles, more than half of the miles included roads deemed, "nonexisting" or of "unsatisfactory standard." Later reports, such as the 1946 figure of 100,414 miles, apparently dropped many of these substandard roads from the count.
  26. Steen, pp. 284-314, citing William B. Greeley, Memorandum on the need for rapid construction of access logging roads in the national forests of the Northwest, 2 March 1946.
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  31. Charles F. Wilkinson and H. Michael Anderson, *Land and Resource Planning in the National Forests*, 1987, Washington, D.C.: Island Press, p. 151.
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  35. *Administration of the Forest Development Transportation System: Temporary Suspension of Road Construction in Roadless Areas*, 1998, Washington, D.C.: U.S. Department of Agriculture, Forest Service, p. 2.
  36. "Road Management Website—News and Information > Q & As," [online], available: <http://www.fs.fed.us/news/roads/qanda.shtml>, visited June 21, 2001; "Charting Our Future... A Nation's Natural Resource Legacy," U.S. Department of Agriculture, Forest Service, FS-630, April 1999, p. 44.
  37. *1999 Status of the Nation's Highways, Bridges and Transit: Conditions and Performance, Report to Congress. Appendix E: Condition and Performance of the Transportation System Serving Federal and Indian Lands*, pp. E-1 to E-15, Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration, Federal Transit Administration, p. E-3.
  38. According to Cartographic Technologies in Brattleboro, VT, Thorofare is 20 miles distant, the second most remote location is 18 miles in the Bob Marshall Wilderness complex of north-central Montana.

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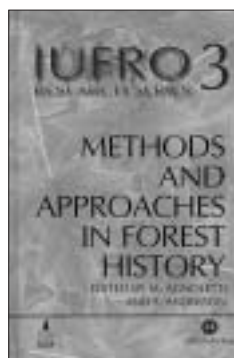


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