



**MARQUEE ATTRACTIONS IN THE NATIONAL PARKS
LOOK JUST FINE, WHILE VITAL—BUT UNSEXY—
PROBLEMS FESTER BEHIND THE SCENERY.
THIS IS WHAT AN \$11 BILLION MAINTENANCE
BACKLOG LOOKS LIKE, AND WHY IT KEEPS GROWING.**

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Nancy Ward pulled the pickup to the side of the road and stopped just short of the Yellowstone River bridge. We got out and picked up a vague trail in the soft, sandy dirt that leads under the first span, then downhill toward the river below. The trail is obviously unofficial, off the books. “Fishermen,” Ward said.

Ward is the chief of maintenance at Yellowstone National Park. Although she has worked at Yellowstone for more than 30 years, her voice still carries a hint of a twang from her Tennessee upbringing. Ward is an impassioned practitioner of the fine art of fly fishing, but we’re not looking for a spot to cast for cutthroat trout. We’re looking at the bridge.

“Within our region we have the top five worst bridges. And if you look within that top five, three of them are on different entrance roads into the park,” Ward said. The Yellowstone River bridge, a 604-foot-long reinforced concrete span built in 1961, is at the head of the list. The structure is classed

as “severely deficient, requiring reduced loads and/or frequent inspections,” according to the Structural Priority List maintained by the park service’s Intermountain Region, which extends from Montana to Texas. Viewed from below, the edges of the road deck look as if they’ve been gnawed on by a giant beaver. At the roadway level, crumbling concrete and exposed rebar are prominent along both sides of the deck. On one side of the bridge, a wooden pedestrian walkway has rotted away, leaving a studded trail of rusted bolts flagged by a row of battered blaze-orange hazard cones.

The Yellowstone River bridge is just one item on a list of tens of thousands, if not hundreds of thousands, of deferred projects. The National Park Service’s system-wide total for deferred maintenance was clocked at \$11.49 billion at the end of fiscal year 2014. The park service has grappled with maintenance budget issues for decades. The backlog has grown slowly but steadily, rising by about 15 percent since the beginning of the Obama administration. By way of comparison, the 2015 budget for the Department of the Interior as a whole was \$11.9 billion. The park service describes its deferred maintenance figure as a “snapshot,” a freeze-frame in an epic budget drama.

OPPOSITE
The Yellowstone River bridge is classified as “severely deficient.” It carries park traffic and is also part of U.S. Highway 212.

TO RUIN

THE PARK SERVICE'S MANAGEMENT SYSTEM
ENSURES THAT STAR ATTRACTIONS ARE
MAINTAINED TO STANDARDS THAT ARE IMPOSSIBLE
TO MAINTAIN FOR ALL ASSETS IN THE SYSTEM.
THUS THE PUBLIC IS SELDOM IF EVER EXPOSED TO
THE DARKER SIDE OF DEFERRED MAINTENANCE.

The bridge that Ward showed me carries the park's northeast entrance road over the sulfurous and fuming Yellowstone River. Although commercial traffic is prohibited on park roadways, the Yellowstone road system is part of the regional highway system that serves the western section of Wyoming, connecting it with Montana and Idaho. The park's bridges are a part of the everyday lives of many people. Last August, a shorter, somewhat older bridge near Pompeys Pillar National Monument, downstream in Montana, collapsed less than a year after being listed as deficient by a state survey.

Earlier that morning, Ward had walked me through a cluster of trailers in Mammoth Hot Springs that serve as housing for some of the park's summer workforce. Warped and water-stained ceilings provided a gloomy cover to 1970s-era plywood paneled walls, sagging bathroom fixtures in vintage harvest-gold colors, and kitchens with Formica counters worn through to the Masonite substrate. "This is about the worst of them," Ward said, as she unlocked a splintering door held together with thick bands of duct tape. Her typically upbeat voice took on a resigned tone. "We've replaced most of the old ones, but still..." Her voice trailed off.

After looking at the bridge, we broke for a picnic lunch at an overlook near Roosevelt Lodge. Ward showed me recently upgraded walkways and wheelchair-accessible ramps that open the Yellowstone experience to as wide a public as possible. She talked about the challenges of keeping up with time and the forces of nature, as well as the constant pressure that a growing public places on the park and its resources. "The more I look, the more I see," she said. When I spilled the bag of chips Ward had

been sharing with me, she picked up every fallen crumb, stowing them in a plastic bag. Human food, with its cocktail of salty and sweet additives, is toxically addictive to wildlife; a single meal of human leavings has turned some bears into "problem animals" as they search for more. Even a picnic has a maintenance impact.

I first met with Ward in the office of Dan Wenk, the superintendent of the park, in the trim campus of sandstone buildings built by the U.S. Army more than a century ago. "You're in a park that's bigger than Rhode Island and Delaware combined," Wenk said. "There's an incredible amount of infrastructure. By some estimates there's close to a billion dollars' worth of backlog just in our road systems. And that's just Yellowstone." Wenk pointed out that many of the roads within the park remain in a 22-foot-wide road prism, for example, although 30 feet is now the park service standard nationwide. In addition to the deferred expense of widening the roadways, the consequences for the flow of traffic within the park are heavy. Geothermal features along the Gibbon River, for example, required moving a section of the Grand Loop Road at Yellowstone. A special system of underground vents had to be constructed to release heated gases to the atmosphere. Overall cost: \$16.3 million. During peak tourist season, the construction caused traffic delays of half an hour or more.

The National Park System now owns and manages thousands of structures. The wide open spaces and natural scenery that spurred the creation of the parks required little if any maintenance, but the landscape was soon endowed with facilities constructed to provide hospitality and services to visitors. Roads and trails were built, as well as infrastructure to provide basic services such as water, electricity, and waste treatment. Many of these are now listed on the National Register of Historic Places or are eligible to be listed. Protocols for maintenance, deferred or otherwise, must factor in preservation status along with the ordinary demands of facilities repair.

The park service does not have a maintenance budget as such. The appropriation for the operation of the National Park Service contains funds for maintenance projects with individual budgets of less than \$1 million. The park service construction appropriation, normally capital improvements, includes funds for maintenance construction with budgets of more than \$1 million. The parks also receive funds from the Federal Lands Transportation Program. User fees pay for specific visitor-based maintenance initiatives. Matching a given project to a funding source is a fine art rather than a routine occurrence.

The maintenance backlog in the parks did not appear overnight, and in fact goes back decades. In the late 1990s, the General Accounting Office (now the Government Accountability Office, or GAO) examined the park service's facilities management systems and found them wanting: The park service didn't have a reliable inventory of the assets under its control, nor did it have a uniform

standard to address maintenance of these assets. Further, the GAO found that redundant efforts within the agency added to the confusion.

To respond to the GAO's initiative, the park service adopted a range of computerized information systems that allow for comprehensive planning and allow strategic allocation of maintenance resources. A key element is the Facility Management Software System. Each component of a park is considered an "asset" within the system. For example, each section of road is cataloged—its length and width, the number and location of its culverts, and so on. A calculation that divides the cost of repairs to an asset by the cost of replacing it generates a numeric value of a given asset's present status, called its facility condition index. One challenge to this approach is the fact that in the real world, when the cost of repairing an asset exceeds the cost of replacing it, the cheaper option prevails. But historic structures and exceptional natural landscapes are difficult to assign a value to and are by definition not replaceable as such, and it is not at all uncommon for repair costs to exceed replacement values for these assets.

Nor are all assets considered equal. Interdisciplinary teams within the park service systematically evaluated each asset according to a set group of questions that evaluate empirical data. These ratings generate an asset priority index. High priorities are assigned to assets that most prominently serve the public: Public spaces rank higher than administrative ones. The demand for a particular asset is factored in: Little-used assets are ranked lower than popular ones. Health and safety concerns push up an asset's priority index. Chris Finlay, the chief of facility maintenance at Grand Teton National Park,



ABOVE
Compromised reinforced concrete on the Yellowstone River bridge exposes rebar, which accelerates the decay of the aggregate matrix.

said, “Our portfolios have been prioritized, and there’s a weighting system that helps us with that. Assets that have a direct impact on visitor use and visitor enjoyment get weighted very heavily, and they end up being very high priority. And then those priorities play into our funding mechanics.” Keith Johnston, Finlay’s counterpart at Acadia National Park in Maine, said, “We are

in essence targeting the things that are most important to the most visitors that have the most significance.”

Software-driven maintenance planning is part of a larger trend in federal asset management. The asset management system ensures that the star attractions of the parks are maintained to standards that are financially impossible to maintain for all assets in the system. As a consequence, the general public is seldom if ever exposed to the darker side of deferred maintenance.

When asked how low-priority assets make it onto the maintenance budget, Johnston said, “They don’t.”

Park support facilities, such as office space or housing for the hundreds of seasonal employees needed to operate the parks, seldom appear on priority lists for maintenance. And each park’s asset priority index generates a class of assets that falls behind the facilities condition index curve. Although an “optimizer band” allows adjustments to the dismal science of the Facility Management Software System, as soon as the priority of one asset is upgraded, the program automatically downgrades other assets to balance the budget. At Acadia, a park endowed with a dramatic loop highway and an elegant network of carriage roads much appreciated by bicyclists, the hiking trails suffer disproportionately from deferred maintenance. To further complicate matters, much of

Acadia’s trail network dates from the early 20th century and is considered a cultural landscape, down to the distinctive cairns that mark its paths. Thus trails are historic preservation assets unto themselves, increasing their maintenance costs.

At Grand Teton, a park with a substantial number of “inholdings” (privately owned sites within park boundaries), land that is added to the park frequently contains historic structures that are part of the cultural landscape that is integral to its history. Shannon Dennison, the branch chief in charge of cultural resources at Teton, says the park has 697 structures that qualify for National Register of Historic Places status. These include properties like the 4 Lazy F Dude Ranch, which reflects the early years of the Tetons’ development as a tourist attraction, as well as the building that housed the Snake River Land Company, the shell company that allowed John D. Rockefeller Jr. to purchase thousands of acres of land that were donated to form the park. At 4 Lazy F, log cabins where stressed-out easterners once played at “roughing it” are now home to hundreds of bats and other wildlife. Some are so encrusted with potentially hazardous droppings (hantavirus, anyone?) that they cannot be entered without protective gear. There is hope of restoring the buildings for use as staff summer housing, but in the meantime, said Rusty Mizelle, chief of project management at Grand Teton, “architecture becomes habitat.”

Maintaining cultural landscapes like the 4 Lazy F, as well as managed landscapes in which the ecological balance of wilderness is under threat, places further stress on park

maintenance funds. Owing in part to climate change, cheatgrass (*Bromus tectorum*) is now making inroads into the prairies of Grand Teton. “It’s an invasive,” said Jessica Hendryx Brown, ASLA, one of the landscape architects working at the park. “It’s early to sprout and early to seed, so it outcompetes native grasses. It also has shallow roots and dries out earlier than other species, so it creates a wildfire hazard.” During my visit, I watched teams of workers spray the grass with a selective herbicide, leaving it dyed a pale green. Treating a moderate infestation of cheatgrass costs about \$2,500 per acre, and treatment must be applied annually.

Newer types of national parks have created new types of maintenance responsibilities. Urban parks, a key component in the park service’s national strategy, have special demands. Frequently their assets are almost entirely buildings and other constructed elements. For example, although the Lowell National Historical Park, in Massachusetts, occupies a mere 19 acres within a designated historic district of 385 acres, the assets under its management pose a range of challenges. Created by legislation enacted in 1978, the Lowell park’s purpose is to preserve and interpret a key period of America’s industrial history. The park’s creation, spurred in part by Senator Paul Tsongas, a Lowell native, intertwined with a broad program to revitalize a city economically stranded by the departure of the textile industry that created it.

The Lowell park includes 19th-century canals that funnel the waters of the Merrimack River through a phalanx of mill buildings, many of which are now condominiums, office spaces, or in use by nonprofit orga-

nizations, including a branch of the state university. The park manages operational locks as well as a range of water system structures. A power plant still generates electricity using the force of the river, although the waterpower itself belongs to an Italian consortium. A streetcar system threads through the historic district, and the park maintains an assortment of historic buildings, pathways, and roads.

According to the park assistant superintendent, Peter Aucella, at present 90 percent of Lowell’s inventory of 5.2 million square feet of floor space left vacant in the mill buildings, some of it severely damaged, has been renovated for reuse, with another 4 percent currently under restoration. Most of this is private sector investment, but the park plays a quiet and persistent leadership role in the city’s economic redevelopment. At a ribbon-cutting ceremony for a section of the Concord River Greenway funded in part by a park service grant, Lowell City Manager Kevin J. Murphy said, “The National Park Service is a great partner in this city. I don’t think people know how good a partner it is.”

One of the park’s major attractions, the Boott Cotton Mill No. 6, is now a museum and education center with a floor full of functioning power looms. Among the park’s deferred maintenance projects is replacement of the mill’s 474 windows, four-by-eight-foot, multipaned windows, which provided lighting in the five-story brick building in the pre-electric era. A private developer had replaced the windows before the building became a park service property. The wood muntins succumbed to rot, dropping panes of glass onto the sidewalks below. Replicating the 19th-century windows with modern aluminum double-paned construction costs \$7,500 per window. Sixty-two windows have been replaced and a grant will fund the replacement of another 42, but the price tag remains too high to complete the project. The park service’s Denver Service Center is now conducting a value analysis on the best solution that both preserves the building’s integrity as a historic structure and doesn’t



ABOVE
Decades-old mobile homes serve as summer staff housing at Mammoth Hot Springs in Yellowstone National Park, an example of the hidden, nonpublic aspect of the maintenance backlog.

PHILANTHROPY VIEWS MAINTENANCE WITH CAUTION.
“SO MUCH OF THE DEFERRED MAINTENANCE
IS THINGS LIKE ROADS AND SEWER
SYSTEMS,” SAID LESLIE MATTSON OF THE
GRAND TETON NATIONAL PARK FOUNDATION.
“WE CAN’T ENGAGE DONORS AROUND THAT.”

break the bank. In the meantime, Plexiglas sheeting covers many windows.

Private philanthropy has been a component of the development of the national parks. The National Park Foundation, an independent nonprofit, spearheads efforts to supplement the parks’ resources, and it serves as the informal leader of about 150 separate “friends” organizations that support individual parks within the network. These groups channel hundreds of thousands of hours of volunteer labor into the parks as well as millions of dollars in aid. Maintenance, however, is not the principal aim of these groups.

The Grand Teton National Park Foundation coordinated fund-raising efforts to build a dramatic \$22 million visitor center at the park. This type of capital investment is typical of private sector gifts, providing donors with a tangible result for their dollars. More recently, the foundation raised \$14 million in a campaign targeted at renewing the heavily used Jenny Lake area of the park. The foundation and the park administration developed a partnership to integrate the construction of new visitor facilities with long-needed upgrades to water, sewer, and other infrastructure components. New “front country” facilities, including an interpretive plaza, are funded by the foundation. Hershberger Design, a Jackson, Wyoming, landscape architecture firm, provided the designs. The park itself assumed the cost of the less visible infrastructure needs.

The foundation’s efforts also provide millions of dollars for reconstruction and reconfiguration of trails in the backcountry, including the area around the famed

Inspiration Point. Heavy use had eroded the trails to the point where they looked more like washed-out gullies. Popular waterfront areas have also been worn raw. Trails are being rebuilt using local materials, including toaster oven and microwave sized boulders airlifted to the site by helicopter. The foundation’s funds have allowed the park to revive Civilian Conservation Corps-style dry stone masonry construction on the trails, executed by specialized crews. “Dry stone masonry has a projected life span of 75 to 100 years,” said Matt Hazard, a park service landscape architect charged with managing the backcountry project. “Concrete masonry lasts about 25.” Completed sections of the trail indeed seamlessly integrate with historic trails within the park, and stand ready to accumulate mosses, lichens, and visitor footprints for the next century.

Philanthropy, however, views maintenance with caution. “So much of the deferred maintenance is things like roads and sewer systems and those sorts of things. And it’s just that we can’t engage donors around that,” said Leslie Mattson, president of the Grand Teton National Park Foundation. “Would you give money to improve a sewer system?” The National Park Foundation spokesperson Marjorie Taft Hall emphasized that maintenance and infrastructure generally have not been an arena for private philanthropy. “They usually fall under the federal purview,” she

said. “There’s lots of talk about the potential role that private philanthropy could play in that conversation, but at the same time the idea always has been that there’s a public/private partnership. And for one there has to be the other. There needs to be public support and funding behind it.”

Many national park properties remain open free of charge to the public. Most of the parks that do charge entrance fees and user fees, however, have not raised their rates in as much as six years, even though many user fees are now retained by the parks for their own use. Currently, \$80 buys an annual pass to all the sites in the system. For people age 62 and over, a lifetime pass costs \$10. The parks have begun the process of raising user fees, but the process has been slow, even where visitors agree that the cost is very low compared to other tourist attractions.

Private, for-profit concessions within the parks also contribute some revenue. How much remains an open question. Despite their long historical presence, their role remains controversial. In some instances, the park service is required to buy back improvements to facilities made by for-profit franchisees under the concept of “possessory interest.” As a result, the operators of highly profitable hotels in glamorous locations not only capitalize on the park service’s investment in the parks, but they also receive reimbursements for what would be their normal operating costs in a standard commercial environment. Revisiting the concession system may well open new channels for park funding. It certainly makes little sense for private companies to make a profit on assets provided and maintained by taxpayer dollars; some would call it socialism in reverse. Jennifer Ashley of the GAO’s public affairs office says the agency has initiated a fresh study of concession operations within the parks. The

GAO will also be re-examining the maintenance backlog in a separate study.

It has long been recognized that for the most part the national parks serve middle- and upper-income Americans who have the funds and leisure for travel. Although the parks have made efforts to address this imbalance, such as developing special programming for disadvantaged young people, this premise has served as an argument for increasing user fees and sparing lower-income taxpayers the cost of facilities they are unable to enjoy. Some have suggested a higher fee scale for international visitors who have become a significant component in park visitation; this practice is not uncommon in Europe and Africa. Yet there remains a widespread feeling that “our national parks” ought to be free to everyone as a vital component of the American experience. The parks are no longer simply protected zones offering recreational facilities. Few could speak, as John Muir did, of “happy trees” in a climate of strategic asset management. Yet for both citizens and foreign visitors alike, the national parks provide a common ground in both the physical and metaphoric senses of the term, a matrix within which a hint of the scope of the American enterprise can be experienced firsthand.

The budget for the park service’s centennial year has been given several boosts, including a three-year program of \$100 million installments that are projected to get the maintenance backlog below the quarter-billion-dollar mark over a 10-year period, longer than any single presidential incumbency. The national parks have been a long-term project in this youngest and most experimental of democracies. Our attention span these days, however, is brief. ●

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ABOVE
This trail at Jenny Lake in Grand Teton National Park has been eroded by heavy use and rough weather to the point where it has been closed for safety reasons.