Facilities Management in the National Park Service:
A Model for Sustainability and Preservation
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The Science Underlying Facility Management in the National Park Service—Much More than Meets the Eye

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In 1905, Albert Einstein first proposed his Theory of Special Relativity. This theory states that our universe includes four dimensions: three that are referred to as space, and a fourth as time, which together constitute "spacetime." In this view, time and space are inextricably linked. According to Einstein, two people observing the same event in the same way could perceive that event occurring at two different times depending on their distance from the event in question. These perceived differences arise from the time it takes for light to travel through space. Because light travels at a finite and ever-constant speed, an observer from a more distant point will perceive an event as occurring later in time, even though it is actually occurring at the same instant. Thus, time is dependent on space. If Einstein's theory is valid—and for the sake of argument, let us assume that it is—then it is therefore impossible to fully evaluate or appreciate the diversity of an environment from within the confines of that environment—simply stated, it is not possible to see the entire forest through the trees.

Clearly, 1905 was a monumental year for profound scientific revelations, and, given the generalized curiosity of the era, presumably in countless other disciplines as well, including land management. For purposes of this discussion, however, let us consider the significance of another revolutionary and enduring event that took place little more than a decade later: the Organic Act of 1916. That pinnacle event signaled the creation of the National Park Service (NPS) as well as the coming of age of the previously existing (but unaffiliated) national parks. It, in many ways, epitomized our nation's commitment to an expanding preservation effort, a commitment built on other significant actions, such as the establishment of the White River Plateau Timber Reserve in the 1890s and the designation of Mesa Verde National Park in 1906. While it is not likely that Einstein's theory was foremost in President Woodrow Wil-

The George Wright Forum, vol. 31, no. 1, pp. 22–24 (2014).

ISSN 0732-4715. Please direct all permissions requests to info@georgewright.org.

son's mind when he signed the Organic Act on August 25, 1916, the aggregate outcome of creating a unified NPS certainly enabled the means by which missions and resources could now be viewed from beyond the plane in which they originally existed, and data derived from this examination could one day be evaluated in a much more scientific context. A concept that took root in 1872 with the creation of Yellowstone National Park had reached maturity.

The complex task of managing today's more than 400 national parks, located in vastly diverse environments, often separated by thousands of miles, must balance equal measures of flexibility and homogeneity to effectively address the needs of park units supporting an array of mission requirements. Until 1916, federally protected areas were largely managed in a rather individualized and independent fashion; and while much of this autonomy has been retained in the contemporary culture of the service, much has also been introduced to ensure consistency and uniformity across great distances and myriad park boundaries.

Since its inception, the NPS has remained a dynamic and responsive organization. Now nearing its first century as a US government agency, it retains, as a core mission at every level, an awareness of the needs and desires of the American public—and it has reacted to this requirement through continuous and significant change. Management decisions have responded to the needs and desires of its very public constituency, even when those decisions have resulted in limited reorganization, expanded or redefined mission requirements, or revised goals and objectives. Arguably, one of the most critical responsibilities—consistent, professional support to the demands of an agency with such far-reaching, decentralized, and often subjective needs—rests in the hands of those who ensure the sustainability of that agency's infrastructure.

Although it would be impractical and is beyond the scope of this discussion to fully examine, in a comprehensive or all-inclusive fashion, all the elements that form the NPS Facility Management Program, it is appropriate to acknowledge the complex, coordinative effort necessary to sustain the NPS infrastructure and enable an environment that is conducive to a positive visitor experience. An eclectic and geographically diverse team of facilities and preservation professionals are continuously engaged in collaborative initiatives in support of this mission. Their efforts support the continued viability of programs and activities, such as natural, cultural, and historic asset preservation; the development of business practices and processes to address the life-cycle asset management requirements of conventional (e.g., buildings, roads), as well as non-industry-standard assets (e.g., maintained landscapes, fortifications); and the refinement of planning and prioritization methodologies to safeguard the service's financial and environmental sustainability. The sum of these actions helps to ensure that all high-priority NPS-constructed assets are maintained at levels that will maximize their life expectancy, that historic and cultural assets are maintained into perpetuity, and that NPS staff are provided with the tools and information to encourage and support energy conservation and carbon footprint reduction.

Just over a decade ago, the NPS Park Facility Management Division (PFMD) embarked on a long-term initiative to introduce and use the Facility Management Software System (FMSS), an enterprise work management system. It was clear, at the time, that parks could no longer continue "going about their own routines" absent coordination or an awareness of similar actions that may have been taking place in other areas of the service. And they could no longer practice effective life-cycle asset management without access to accurate, current,

and reliable data about the asset portfolio. The FMSS is more than just a work management system: it is a comprehensive database that drives all life-cycle asset management activities—from planning and budgeting to condition assessment, operations and maintenance, repair/rehabilitation, and disposal.

Discussed in greater detail in the following articles, the FMSS has been instrumental in the NPS's ability to better navigate that "spacetime" continuum where critical asset data had previously been lost or misinterpreted: often the same event simultaneously observed in more than one geographic location resulted in different perceived outcomes. The FMSS has made it possible for facility management staffs to store, maintain, retrieve, and track data in real time, creating a more accurate picture of facilities needs from within a given environment. This picture uses information derived from a consolidation of collected data and takes into account the state of a park environment from an external viewpoint—in effect, enabling managers to make decisions based on information not customarily available through local analysis.

This system—and the more than 10 years of empirical data that it supports—has proven invaluable to the practice of life-cycle asset management across the service. In recent years, these data have also become increasingly applicable to other NPS programs not traditionally associated with facility management. The integration of data obtained from the routine and periodic maintenance of constructed and historic assets has, for example, proven quite useful to the NPS Cultural Resources Program and to the NPS staffs who support the interpretive and educational goals of the service. Although some of that data, such as an asset's current replacement value, may not weigh heavily on or even be calculable for some cultural or historic assets, other data, for example the parameters and costs associated with regular maintenance and the frequency of that maintenance, are exceptionally valuable to the upkeep of such assets. The value of these data to the practice of sound asset management has also led to an increased level of international and interagency cooperation, which you will read more about in this series.

While it admittedly requires a fairly active imagination to draw a straight line between Einstein's Theory of Special Relativity and contemporary facility management strategies, it is reasonably clear that the observations of this early-20th-century physicist may have also provided some of the philosophical underpinnings upon which a truly effective and professional facility management program has been founded. In environments where managers must engage in both the art and the science of facility management to make often-critical decisions about irreplaceable natural, cultural, and historic assets or resources, they must also have the information, tools, and processes to enable them to see the forest through the trees.

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