From A to Z –
Capacity Issues of Arches and Zion National Parks

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“Can parks embrace an unlimited number of visitors while retaining what made them, as the
writer Wallace Stegner once put it, ‘the best idea we ever had’?” i -- The Guardian

From A…

After a long wait to enter the park, Caleb, an current MBA student, was handed a map by a
ranger manning the entrance gate to Arches National Park (ANP). Caleb was warned that the
park was expecting large crowds and heavy traffic throughout the day. The entrance into ANP
began with a long road winding along the side of a cliff, which ultimately would bring him up to
a massive plateau where he could begin to explore the park’s many hikes and scenic overlooks.
Traffic was so heavy on this road that it took Caleb nearly an hour to simply travel the few miles
to reach the first parking area. Cars were jam-packed throughout the park, making parking near-
impossible to find. Occasionally, Caleb was able to park for a scenic hike; but the trails were
usually so packed with people that it felt like shoulder-to-shoulder lines taking one step at a time.

As the day drew to a close, Caleb decided to visit Delicate Arch, arguably the primary attraction
at ANP. After hunting down yet another scarce parking spot, Caleb was shocked by the steady
stream of people winding their way up and down the trail, and even more surprised by the empty
plastic water bottles and other litter scattered around. Fortunately, these annoyances could not
entirely keep the massive rock features from inspiring a once-in-a-lifetime feeling of awe. When
Caleb finally rounded the cliff side to come into view of Delicate Arch, he was overwhelmed by
its enormous size and beauty. The red arch stood alone on top of a mound of slick rock, draped
with blue skies, creating a visually-stunning contrast. This arch is quite possibly one of the most
beautiful natural rock formations in the world.

Hundreds of people surrounded the arch, all trying to get the perfect picture. Behind them, a
steady stream of visitors continued up the trail, lining up next to the arch for their turn to take a
picture. The talking and noise echoed through the rock formations, diminishing the chance of
stealing a moment of scenic tranquility.
...To Z  

200 miles to the southwest, John Marciano, Zion National Park’s (ZNP) public information officer, slowly drove his vehicle on the shoulder of the road as he passed car after car (see Exhibit 1). Every now and then he would steal a glance into some of the vehicles. Each had a story to tell. Some occupants had license plates from across the country. Some were tour buses carrying people from around the world. Some had young children that were obviously getting antsy. Others demonstrated telltale signs of frustration as they waited. It was like being in a Los Angeles rush hour in the middle of the desert. The line to get into the park had now backed all the way into Springdale (pop. 592), the local community just outside of the park. It was no longer uncommon to wait two hours in line just to be admitted. Once entering the park, visitors would make their way to the shuttle line. Some days people could wait for an additional hour (sometimes even longer) to board the shuttle to finally enter the canyon they came to see.

Inside the park, the hiking trails were also near their capacity. The hike up Angels Landing (see Exhibit 2), one of the most popular attractions, had a steady stream of people traversing the 5.2-mile, switchback-laden, steep trail, the last half-mile of which included a chain railing to assist hikers up the dangerous, narrow trail. The reward for persistent hikers, though, was a 360-degree view of the unique and stunning red rock vistas in Zion Canyon.

John regularly heard from visitors that the restrooms at ZNP were in constant need of cleaning and emptying. The park boasted 69 miles of official paths. Unfortunately, hikers have trampled an additional 30 miles of unsanctioned “social trails” that damage the delicate soil and kill natural vegetation. Hikers make their way up Virgin River, surrounded by a towering thousand-foot-tall gorge on a popular hike called The Narrows, but John knew the area was experiencing environmental degradation, due to people going off trail, and in some cases, even defecating on the side of the trail. John’s understaffed crew of rangers had a hard time maintaining and protecting the natural beauty of the canyon, with thousands of visitors flooding the area daily during peak months of the year.

Experience at Capacity

Overcrowding is now a common sight at many of the nation’s parks, including both Arches and Zion, two of the five national parks located in the state of Utah. Due to their uncommon beauty and fame, both Arches and Zion have become huge attractions. ANP experienced nearly a doubling of visitors in the past decade, leading to an estimated 1.6 million visitors in 2018. ZNP saw similar growth during that time period, leading to an estimated 4.5 million visitors. This massive growth hasn’t shown any signs of slowing down (see Exhibit 3). While the increased interest in experiencing natural beauty and the resulting desire to enjoy the national parks has been welcomed, the capacity level of these parks is being strained. This has led some to worry that the parks may become damaged beyond repair, and it is abundantly clear that the visitor experience has deteriorated, given the long waits in long lines to see overcrowded sites.
This capacity problem has now come into focus and is a center of much recent debate. Some want to limit the number of visitors entering the parks in order to preserve the natural environment and improve the experience of visitors. Others are worried that limiting the number of visitors will negatively affect the economy of local communities that rely heavily on the tourist flow. Still others point out that the National Park system is underfunded, understaffed, under-maintained and unable to adequately support the large crowds of visitors in a way that will preserve the parks for future generations.

United States National Park System

Other national parks such as Yosemite, Yellowstone, Glacier, and the Grand Canyon are facing similar issues, prompting officials from these parks to watch developments at Arches and Zion very closely.

On March 1, 1872, the United States Congress designated territory in Montana and Wyoming “as a public park or pleasuring-ground for the benefit and enjoyment of the people.” This territory is now known as Yellowstone National Park. On August 25, 1916, President Woodrow Wilson signed the "Organic Act" creating the National Park Service (NPS), a federal bureau in the Department of the Interior responsible for maintaining national parks and monuments.

Recently celebrating their centennial year, NPS now employs 27,000 people and has since expanded to managing 419 units (61 designated as parks), 150 related areas, and numerous programs that assist in conserving the nation's natural and cultural heritage for the benefit of current and future generations. NPS manages “more than 84 million acres in all 50 states, the District of Columbia, and US territories. While there are at least 19 naming designations, these units are commonly referred to as "parks." Multiple parks may be managed together as an administrative unit with the National Park Service.”

In the year 2000, the National Park Service revamped and defined their mission to communicate the following:

“The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.”

To become a National Park, an area has to meet certain criteria and pass through an extensive legal process, culminating in its confirmation by the President of the United States. Regardless of the method used, all parks are to be of national importance, and each must meet all four of the following standards:

- It is an outstanding example of a particular type of resource.
- It possesses exceptional value or quality in illustrating or interpreting the natural or cultural themes of our Nation's heritage.
• It offers superlative opportunities for recreation, for public use and enjoyment, or for scientific study.
• It retains a high degree of integrity as a true, accurate, and relatively unspoiled example of the resource.

Overview of Arches National Park (See Exhibits 4 and 5)

Arches was designated the “Arches National Monument” on April 12, 1929 by President Herbert Hoover. Its name was inspired by the more than 2000 natural bridges and arches carved out of sandstone during millions of years of natural erosion. On November 25, 1938, President Franklin D. Roosevelt enlarged the range of protected land around the monument. The Arches Visitor Center was completed in 1959, and the park was again enlarged on July 22, 1960, by President Dwight D. Eisenhower. It wasn’t until November 12, 1971 that President Richard Nixon changed Arches from a National Monument to a National Park. During this time, the park saw many visitors, but the numbers remained relatively consistent, and well within ANP’s capacity. The park was again enlarged on October 30, 1998 by President Clinton. During the next 20 years, ANP saw a steady climb in visitation rates, particularly over the popular summer months and holidays.

Arches National Park sits immediately off Highway 191, adjacent to the Colorado River, about a five-mile drive from the largest city in the nearby area, Moab (pop. 5,000). Moab offers the general amenities and accommodations required by park visitors. The town’s primary economic driver is tourism; it is a world-renowned mountain biking, off-roading, and other outdoor recreation. The area provides a paradise for hiking, river rafting and Hummer or Jeep tours. Due to the unique landscape, the amount of publicly-accessible land nearby, the remote isolation of the general area, and the sparse population, most visitors to ANP travel long distances to get there and are in the region specifically for recreation. ANP is about 500 miles from Las Vegas, Nevada, 354 miles from Denver, Colorado, and 230 miles from Salt Lake City, Utah.

The park has only one entrance and exit site and one primary road running through the park, with several splinters to reach popular scenic views or hikes. It is roughly 120 square miles, with a round-trip of its major paved roadways adding up to approximately 36 miles. This road is the primary (and the only public) artery to any site in the park. While there are numerous overlooks and scenic turnoffs, only a few offers much parking beyond a dozen vehicles at any given time. There are three larger parking lots available, each of which is located at the beginning of a major trailhead or trail network. All of these lots, combined with the oversized parking spots for buses and RVs in the park, total around 500 parking spots. However, these are often filled for hours at a time, due to the length of the hikes and time spent by people in the park. The layout of the roadway often forces patrons to repeatedly loop through the parking areas waiting for a spot to open up, creating even greater congestion in the parking areas.

ANP provides a distinct, clear representation of Utah as a state; perhaps more than any other symbol. Delicate Arch, one of the most popular features of the park, is on many Utah vehicle license plates, and was even added recently as a design feature of the court and uniforms for the
Utah Jazz National Basketball Association team located in Salt Lake City, Utah (see Exhibit 6). Arches National Park has become a clear, well-known symbol of the state of Utah, as awareness of its features has grown across the nation and worldwide.

**Overview of Zion National Park (See Exhibit 7)**

Zion National Park has a long history of human habitation dating back 8,000 years to small family groups of Native Americans. Evidence point to Anasazi, Fremont, and Southern Paiute tribes that occupied the area at various times.xiv Mormon pioneers then settled in the nearby region in the early 1860s. To protect the canyon, this area was named as Mukuntuweap National Monument by President William Howard Taft in 1909. Nine years later, it was enlarged and renamed Zion National Monument. Zion was a name used by the local Mormon community to describe their unified society of Christians. According to historian Hal Rothman: "The name change played to a prevalent bias of the time. Many believed that Spanish and Indian names would deter visitors who, if they could not pronounce the name of a place, might not bother to visit it. The new name, Zion, had greater appeal to an ethnocentric audience."

By 1919, it was re-designated as Zion National Park making it Utah’s oldest national park. In 2009, President Barack Obama signed into law the Omnibus Public Land Management Act, which designated and further protected 124,406 acres of land as the Zion Wilderness.xv Early travel to this area was difficult, due to the lack of paved roads and accommodations in southern Utah. The first automobile road was built in 1910, and was extended and upgraded over time. When Zion-Mount Carmel Highway opened in 1930, visits to this area significantly increased. Over the next 60 years traffic congestion continued to worsen in the narrow canyon.xvi This resulted in public transportation shuttle service being instituted in 2000 to replace private vehicles. This increased capacity during peak seasons.

With infrastructure continuously improved, visitation to Zion National Park has exponentially increased over the years. There were about 59,000 visitors in 1931, increasing to 4.5 million in 2017 (see Exhibit 3). Zion is only 2.5 hours away from Las Vegas, which allows single-day tours boasting spectacular sceneries, especially along the six-mile Zion Canyon scenic drive and the Zion-Mount Carmel Highway.

Zion is one of the smallest national parks, but is consistently one of the most visited.xvii It ranks third in number of visitors, after Great Smokey Mountain National Park and the Grand Canyon National Park.xviii Some of the more prominent national parks, like Yellowstone and the Grand Canyon, are much larger and more spread out, with better access and more roads.

**The Mighty Five and Social Media**

In 2013, the Utah Office of Tourism launched a $3.1 million advertisement campaign, known as “The Mighty 5,” to increase tourism in all five of Utah’s National Parks (see Exhibit 8).xix The Mighty 5 include Bryce Canyon and Zion in the southwest, Capitol Reef in the central, and
Arches and Canyonlands in the southeastern parts of the state. After these campaigns, Utah’s national parks saw an immediate increase in visitation.xx

The success of The Mighty Five campaign was further amplified by the steady increase in social media activity providing free advertising to previously little-known outdoor sites, and an increase in disposable income and travel around the world and in the United States.xxi The Utah Mighty Five promotion promises travelers the world-over the opportunity to post online proof of their experience of unique sites, fulfilling the need to seek destination-based, immersive experiences.

**Local Impact and Economics of National Parks**

The state of Utah has experienced positive job growth and an economic boom linked to tourism. “Travelers to Utah spent $8.4 billion in 2016, helping to support more than 144,000 jobs and an estimated $5.6 billion in total wages. Washington County (ZNP) showed the second-fastest employment growth in the state among jobs in leisure and hospitality.”xxii The Mighty 5 parks alone brought 15.2 million visitors in 2017, purportedly contributing $1.1 billion in spending and supporting 17,600 jobs.xxiii These statistics suggest that the success of national parks is an economic engine for growth for the state and local communities.

That said, the increase in employment and revenue does come at other costs for locals. Increased traffic, crime, littering, and pollution can be correlated to the higher demand of Utah national parks. A portion of local residents love the increased business and revenue. However, many locals throughout southern and eastern Utah counties resent the mass influx of tourists and visitors and feel that the impact of increased visitation rates is primarily negative.xxiv

Despite the consistent, decade-long attendance growth and the proven economic value of the national parks, the national park system is underfunded and has an estimated maintenance backlog of $11.6 billion.xxv Funding to maintain and staff parks is dictated by national budgets with no sign of future increases. In fact, the opposite scenario seems to be playing out, as the 2019 Trump administration’s budget called for a seven percent budget decrease for national parks.xxvi

**Other Considerations**

One of the most immediately-obvious problems is a major infrastructural issue, as indicated by the backlog of maintenance expenses reported by the NPS. The road and facilities of ANP and ZNP were not built to effectively accommodate the magnitude of today’s crowds. Both parks have only one main entry point, making things particularly difficult during the parks’ peak season (approximately May - August, though two months before and after these times are also still busy; see Exhibit 9), and especially during peak times of the day (generally considered to be from about 10:00am - 3:00pm; see Exhibit 10). These entry points often see significant backups, sometimes leading to lines stretching far, with wait times as long as an hour simply to enter the park (see picture in Exhibit 9). Once visitors enter, parking is relatively scarce, and most of the
traffic is concentrated in a few extremely popular areas. The nature of the design of both parks, with one long primary road running past many of their most popular features, also contributes to frequent traffic jams.

This crowding and related environmental concerns are the clearly-seen, surface-level problems being evaluated at this time. However, escalating issues at other parks help further demonstrate the importance of finding a resolution as quickly as possible. Other national parks report a variety of additional problems that damage the experience as they grow more popular: managing the volume of human waste and cleanliness of facilities; fights breaking out over parking spaces; the hunt for a great Instagram or Snapchat post leading to injuries and even death in some cases; and tourism-based towns close to park entrances struggling to maintain their unique cultures and “vibes” in the face of hundreds of thousands of visitors, with at least one even encountering drinking water shortages after visitors damaged their water source.xxvii

Many of these capacity problems could theoretically be resolved with a relatively straightforward expansion of parking lots, roads, entrances, and other pieces of infrastructure within the park. However, the need to carefully preserve the wildlife and natural features in the region makes it difficult to effectively expand parking areas and address other capacity constraints. For example, crowds have already begun to cause major soil loss in ANP and the surrounding area.xxviii

This ethical dilemma is challenging; national parks were created to afford both greater protection to areas of significance and greater access to them for the American public. Now, they are becoming popular enough to threaten both of these purposes. Rather than desperately needing increased marketing efforts to create greater interest (as had been the case at times in the pastxxix), parks are struggling to handle the patronage they already have and expand capacity to fit everyone who wants to visit.

The cost to enter national parks is inexpensive compared to other “entertainment” venues (see Exhibit 11). The 2019 Trump administration proposed nearly tripling the price of admission for seventeen of the nation’s most popular national parks, in order to make up for proposed budget cuts and pay for needed facility upgrades. The proposal led to public outcry, with many expressing concern that a $70 per car entrance fee would make the parks inaccessible to low-income families. The National Park Service gathered public comments that suggested a raising of prices would introduce further ethical dilemmas; one person wrote “Our parks are for ALL of the American people, not just those who are wealthy,” another wrote, “We do not want our parks to become only a destination for the wealthy and for foreign tourists -- these parks are America’s heritage, and everyone deserves to see them.”xxx

The Solution?

As Caleb sat within view of Delicate Arch at Arches National Park, he considered the complex web of public interest, ethics, environmental concerns, and public policy that had contributed to the current state of the park. He had several potential solutions in mind, but knew that each had its set of benefits and drawbacks.
Caleb’s services management background led him to envision multiple ways to attempt to shift and “smooth out” demand for the “product” the park had to offer. For example, he knew of some parks, such as Muir Woods in California, that had begun to require prior reservations for entry or to see especially popular features. He had also heard the term “revenue management,” which he felt could be considered in some form -- for example, only requiring reservations or even charging a bit more for entry during peak hours of the day in peak visitation times throughout the year. This could encourage patrons to visit either early in the morning or at a time of year that would be less crowded. There may even be room for greater advertising of the features in Canyonlands National Park, which was located a mere thirty minutes from ANP and had similar features, but experienced about half the annual visitation rate of Arches. Shifting some of the demand for ANP to Canyonlands by increasing awareness of the latter could give ANP some breathing room.

At Zion, John was considering the potential positive impact of various technological solutions. For example, it might be possible to add simple tickers at each parking area and at the park entry point and keep the volume of cars in each area posted online at all times, hopefully encouraging some locals and other spur-of-the-moment visitors to come outside of the busiest dates and times. Even the power of virtual reality (VR) technology came to mind as a potential way to “shift demand” in the future; what if some of the demand to see these places could be transferred to more of a virtual or online medium?

Alternatively, Caleb and John both considered the impact of expanded infrastructure, including adding or widening roads and parking lots, and potentially even adding another entry point to the parks. In the year 2000, ZNP had implemented intricate shuttle bus systems to accommodate growing attendance, but John knew it had, at best, mixed results, and attendance at ZNP had doubled since this solution had been implemented. Was it reasonable to spend further resources to expand and improve this system? Would it make sense for Arches and other parks to use a shuttle system?

At what point would operating at maximum capacity negatively affect the experience of visitors? Should prices be raised or visitors be limited to help manage the continued impact on the parks’ wildlife, vegetation, and ecosystem?

There seemed to be no shortage of potential ways to resolve the capacity problem at national parks. However, as the two considered each option and their merits, Caleb and John recognized the many dilemmas faced by the National Park Service in making the best possible adjustment to manage the increased capacity. John wondered what their top priority should be; was his job more about keeping the environment safe, or about making beautiful, natural scenes accessible to everyone? Should a public service like this even be worried about incorporating principles of services management effectively; and if so, how?
Exhibit 1: Long Lines at the South Entrance to Zion National Park on August 13, 2015


Exhibit 2: Angels Landing Hike

Crowds on the trail to Angels Landing

Views of Zions Canyons on top of Angels Landing
Exhibit 3: Visitation Increases

Retrieved from https://www.nationalparked.com/zion/visitation-statistics
Visitation Increase Since 2006

Visitation to Arches National Park has nearly doubled in the last 10 years.

Arches National Park:

Retrieved from https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20Graph%201904%20-%20Last%20Calendar%20Year?Park=ARCH

Retrieved from https://www.nps.gov/arch/getinvolved/tcmp-meeting.htm
Zion National Park:

Exhibit 4: Selected Features of Arches National Park
Retrieved from https://www.discovermoab.com/arches-national-park/

Crowds around Delicate Arch at Arches National Park
Line forming at the Restrooms at Delicate Arch trailhead parking lot.

Source: Case Writer personal photo, taken June 6, 2019
Exhibit 5: Map of Arches National Park

Exhibit 6: Arches as Symbol of Utah – License Plate and Utah Jazz Court Design


Retrieved from https://dmv.utah.gov/plates
Exhibit 7: Overview of Zion National Park
The Narrows

Retrieved from https://www.upr.org/post/zion-narrows-wild-about-utah
Zion National Park

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<th>Park</th>
<th>Visitors</th>
<th>Non-Recreation Visitors</th>
<th>Concession Lodging</th>
<th>Tent Campers</th>
<th>RV Campers</th>
<th>Concession Camping</th>
<th>Backcountry Campers</th>
<th>Misc Campers</th>
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<tr>
<td>Grand Canyon National Park</td>
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Retrieved from [https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Summary%20of%20Visitor%20Use%20By%20Month%20and%20Year%201979%20-%202017%20Calendar%20Year?Park=ZION](https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Summary%20of%20Visitor%20Use%20By%20Month%20and%20Year%201979%20-%202017%20Calendar%20Year?Park=ZION)
Fees and Permits

America the Beautiful – National Parks and Federal Recreational Lands Pass is honored and also sold at Arches. Cost is $80. This is the best deal for people intending to visit multiple parks within a year’s time. You can get it online.

Private Vehicles/RVs
$25 per vehicle for a 7-day pass

Pedestrian, Bicycle, and Motorcycle
$12 per person for a 7-day pass. Not to exceed $25 per family.

Tunnel Escort
Most buses, RVs, trailers, and dual wheeled trucks require an escort to travel through the Zion–Mt Carmel Tunnel. There is a $15.00 fee per vehicle in addition to the entrance fee. Visitors should pay this fee at park entrance before proceeding to the tunnel. Required for all vehicles and trailers 7’ 10” (2.4 m) in width and/or 11’ 4” (3.4 m) in height or larger. Fee is good for 2 trips through the tunnel for the same vehicle within 7-day period.

Backcountry Permits
Permits are required for all overnight stays in the backcountry and all through hikes of the Virgin River and tributaries, the Left Fork of North Creek (the Subway), Kolob Creek, and all canyons requiring the use of descending gear or ropes. Permits are issued at both visitor centers the day before, or the day of your hike.
Permit Costs:
$10.00 – 1–2 people
$15.00 – 3–7 people
$20.00 – 8–12 people

Retrieved from https://utah.com/zion-national-park/visitor-center
Exhibit 8: Utah Marketing Campaign – “The Mighty 5” Poster and Commercial

![The Mighty 5 Poster and Commercial](https://travel.utah.gov/uncategorized/themighty5campaign)

Mighty 5 Commercial link: [https://www.youtube.com/watch?v=QlKOcyf915M](https://www.youtube.com/watch?v=QlKOcyf915M)

Exhibit 9: Peak Annual Visitation Times (using 2016 as model) and Picture

Daily vehicle entrances at Arches National Park 2016

![Peak Annual Visitation Times](https://www.nps.gov/arch/getinvolved/cmp-meeting.htm)

Retrieved from [https://www.nps.gov/arch/getinvolved/cmp-meeting.htm](https://www.nps.gov/arch/getinvolved/cmp-meeting.htm)
Exhibit 10: Peak Daily Visitation Times (using June 2016 averages as model)

**What’s happening now?**

- The park is busiest from 10 am to 3 pm daily for much of the peak season.

Number of vehicles in the park:
June 2016 daily average

People experience:
- long lines
- traffic congestion
- long walks to trailheads
- crowded parking

Retrieved from [https://www.nps.gov/arch/getinvolved/cmp-meeting.htm](https://www.nps.gov/arch/getinvolved/cmp-meeting.htm)
## Exhibit 11: Other “Entertainment” Venues

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<th>Initial Cost</th>
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<td>1.75</td>
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<td>Bowling Game</td>
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<td>Mini-golf</td>
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<td>Bike Riding</td>
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<td>24</td>
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<td>Canoeing</td>
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*Received from: [https://wealthartisan.com/cost-of-entertainment-per-hour/](https://wealthartisan.com/cost-of-entertainment-per-hour/)*

## End Notes:

4. [https://irma.nps.gov/Stats/SSRSReports/National%20Reports/Visitaton%20By%20State%20and%20By%20Park%20%202017%20%20Last%20Calendar%20Year](https://irma.nps.gov/Stats/SSRSReports/National%20Reports/Visitaton%20By%20State%20and%20By%20Park%20%202017%20%20Last%20Calendar%20Year)
5. [https://www.nps.gov/articles/quick-nps-history.htm](https://www.nps.gov/articles/quick-nps-history.htm)
9. [https://www.nps.gov/articles/arch-timeline.htm](https://www.nps.gov/articles/arch-timeline.htm)