Transportation in US National Parks: Case Studies and Recommendations

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by Abraham Lamontagne

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BACKGROUND

The National Park Service is the gemstone of America’s often-slow attempt to preserve the natural environment. This country is the greatest cause for the declining state of our planet; unfortunately, progress in bringing energy, production, land use, and transportation to a place which could halt or reverse that decline is slow and often stagnant. In the face of a bleak future, National Parks – and other preserved lands – stand out as one of the greatest bastions of hope that we may, occasionally, be capable of protecting the Earth.

Protected lands are given one of over a dozen available monikers to describe their setting and contents, such as National Monument, National Scenic River, or National Historic Site (What’s In a Name?, 2017). However, out of 423 units managed by the NPS, only 63 are currently given the highest distinction of National Park. These parks are named by acts of Congress. Generally, parks are selected for showcasing a variety of outstanding natural features for protection and for their “inspirational, educational, and recreational values” (Difference Between a National Park and a National Monument, 2002). In many cases, these parks will also contain historical features. One such park is Petrified Forest National Park, where several features highlight Native American ruins within the park (Prehistoric People, 2018) as well as remains from the historic alignment of Route 66 (Historic Route 66, 2018). Another park, Mesa Verde, was created in 1906 entirely to preserve its
archaeological sites, raising questions even at the time as to why it wasn't instead created as a monument (Lee, 2001). Even despite this, its function has come to include education about and preservation of the natural features within the park.

As the flagship of conservation and outdoor education in the US, it stands to reason that the parks should also be leaders in sustainable transportation. Transportation is currently the largest source of emissions in the country, responsible for 27% (Environmental Protection Agency, 2022). It’s been clear for a long time that some sort of shift in the way we get from place to place will be needed in the coming years if we’re to keep the world livable – and, of course, these sites preserved. Parks would also see several other benefits from having well-crafted transportation systems. For one, a well-maintained transportation system would improve the experiences of the over 100 million visitors the parks see each year (Ziesler & Spalding, 2022). Additionally, with many of these visitors entering by car, the visual landscape is worsened and natural systems likely damaged by such a high degree of vehicle traffic in popular areas.
PURPOSE & METHODOLOGY

This report examines several parks' transportation systems internally as well as their connections to gateway towns and nearby major cities. From this, I outline what successful parks do and what goals other parks should try to meet to make their transportation systems shine.

To select which parks to study, each park was first given a letter and a number rating based on its NPS-designated proximity to population centers and the greater of its 2019 and 2021 recreational visit count. These two factors play a major role in determining a park's relationship with transportation. Two possible years are used to determine park visits as neither one represents what can be expected as a typical year for all parks. Some parks were still experiencing reduced visitorship due to COVID-19 restrictions in 2021, such that 2019 was the last normal year that can indicate the volume the park's transportation network would experience. In contrast, other parks are no longer experiencing visitor decreases due to restrictions and are seeing more visitors than in 2019, and use of their transportation systems reflects this. Data for these classifications were drawn from the 2019 and 2021 statistical abstracts published by the NPS. See Tables 1-3.
### Table 1. Letter Assignments by NPS Park Area Designation

<table>
<thead>
<tr>
<th>NPS Designation</th>
<th>Definition</th>
<th>Letter Assigned</th>
<th># of Parks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Area Park</td>
<td>More than 75% of the park is located within a 2020 Urbanized Area as defined by the U.S. Census Bureau.</td>
<td>A</td>
<td>1 (+1 Mixed)</td>
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<tr>
<td>Suburban Area Park</td>
<td>More than 75% of the park is located within a 2020 MSA with a population greater than one million people but outside of any Urbanized Area as defined by the U.S. Census Bureau.</td>
<td>B</td>
<td>6 (+2 Mixed)</td>
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<tr>
<td>Outlying Area Park</td>
<td>More than 75% of the park is located within a 2020 Metropolitan Statistical Area (MSA) with a population of less than one million people but outside of any Urbanized Area as defined by the U.S. Census Bureau.</td>
<td>C</td>
<td>11 (+8 Mixed)</td>
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<tr>
<td>Rural Area Park</td>
<td>More than 75% of the park is located outside of any 2020 MSA and is accessible by paved highway, scheduled air, or marine transport services.</td>
<td>D</td>
<td>27</td>
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<tr>
<td>Remote Area Park</td>
<td>More than 75% of the park is located outside of any 2020 MSA and requires special travel arrangements to reach.</td>
<td>E</td>
<td>7</td>
</tr>
<tr>
<td>Mixed Area Park</td>
<td>A park located in a mixture of Outlying Area, Rural Area, Suburban Area, and/or Urban Area with 75% or less of the park area in any one category.</td>
<td>Classified with the most urban area in which at least 25% of the park is located</td>
<td>11</td>
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### Table 2. Number Assignments by 2019 or 2021 Recreational Visit Count

<table>
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<th>Recreational Visits (Greater of 2019 and 2021)</th>
<th>Number Assigned</th>
<th># of Parks</th>
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<td>&gt;4,000,000</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>&gt;2,000,000 and ≤4,000,000</td>
<td>2</td>
<td>10</td>
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<td>&gt;1,000,000 and ≤2,000,000</td>
<td>3</td>
<td>11</td>
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<td>&gt;500,000 and ≤1,000,000</td>
<td>4</td>
<td>15</td>
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<td>≤500,000</td>
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<td>18</td>
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### Table 3. Parks by Visitation Category

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<tr>
<td>1</td>
<td></td>
<td><strong>Saguaro</strong></td>
<td><strong>Great Smoky Mountains</strong></td>
<td><strong>Yellowstone</strong></td>
<td><strong>Yosemite</strong></td>
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<td>Grand Canyon <strong>Zion</strong></td>
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<td><strong>Acadia</strong></td>
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<td></td>
<td>Rocky Mountain</td>
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<td><strong>Grand Teton</strong></td>
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<td>2</td>
<td><strong>Indiana</strong></td>
<td><strong>Dunes</strong></td>
<td><strong>Joshua Tree</strong></td>
<td><strong>Olympic</strong></td>
<td><strong>Glacier</strong></td>
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<td><strong>Mount Rainier</strong></td>
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<td><strong>Bryce Canyon</strong></td>
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<td><strong>Cuyahoga Valley</strong></td>
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<td><strong>Hawai'i Volcanoes</strong></td>
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<td><strong>Shenandoah</strong></td>
<td><strong>Everglades</strong></td>
<td><strong>Arches</strong></td>
<td><strong>Death Valley</strong></td>
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<td><strong>Capitol Reef</strong></td>
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<td><strong>Sequoia</strong></td>
<td><strong>Badlands</strong></td>
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<td><strong>Canyonlands</strong></td>
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<td><strong>Haleakalā</strong></td>
<td><strong>North Cascades</strong></td>
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<td><strong>Denali</strong></td>
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<td>4</td>
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<td><strong>Biscayne</strong></td>
<td><strong>White Sands</strong></td>
<td><strong>Theodore Roosevelt</strong></td>
<td><strong>Glacier Bay</strong></td>
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<td><strong>Kings</strong></td>
<td><strong>Mammoth Cave</strong></td>
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<td><strong>Canyon</strong></td>
<td><strong>Lassen Volcanic</strong></td>
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<td><strong>Wind Cave</strong></td>
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<td><strong>Crater Lake</strong></td>
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<td><strong>Petrified Forest</strong></td>
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<td><strong>Great Sand Dunes</strong></td>
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<td><strong>Big Bend</strong></td>
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<td><strong>Mesa Verde</strong></td>
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<td><strong>Redwood</strong></td>
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<td><strong>Virgin Islands</strong></td>
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<td>5</td>
<td><strong>Pinnacles</strong></td>
<td></td>
<td><strong>Channel Islands</strong></td>
<td><strong>Carlsbad Caverns</strong></td>
<td><strong>Katmai</strong></td>
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<td>Guadalupe Mountains</td>
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<td><strong>Dry</strong></td>
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<td>Voyageurs</td>
<td>Black Canyon of the Gunnison</td>
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<td>Congaree</td>
<td>Kenai Fjords</td>
<td><strong>Isle Royale</strong></td>
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<td></td>
<td>North Cascades</td>
<td>Great Basin</td>
<td><strong>Lake Clark</strong></td>
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<td>Wrangell-St. Elias</td>
<td><strong>Kobuk</strong></td>
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<td>NP of American Samoa</td>
<td><strong>Valley</strong></td>
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<td><strong>Gates of the Arctic</strong></td>
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The following six parks were selected for further study to represent a broad range of classifications as well as transportation options within parks:

- Zion National Park
- Indiana Dunes National Park
- Denali National Park and Preserve
- Petrified Forest National Park
- Pinnacles National Park
- Isle Royale National Park
In the summer of 2000, Zion closed the Zion Canyon Scenic Drive to nearly all personal vehicles for the summer to start operating its new shuttle service. This came as an overdue solution to a longstanding problem. In years before the service began, visitors would often have to skip sections of the scenic drive or turn around frustrated as finding parking proved itself difficult or impossible. This system helped to modernize and preserve a park in which increasing visitation was taking a major toll on the narrow and unwidenable canyon road as well as the surrounding natural environment (Wadsworth, 2018).

The shuttle system consists of two routes: the Zion Canyon Scenic Drive and the Springdale Shuttle. The Scenic Drive is a one-way route that takes visitors from the park entrance to the Temple of Sinawava, while the Springdale Shuttle loops around the town of Springdale and provides access to the park’s visitor center, campgrounds, and other attractions. The Springdale Shuttle is a fairly unique shuttle in the NPS, as its route is located entirely outside the park, doubling as public transit for the town. This line reduces pollution and traffic generated by multi-day park visitors staying in Springdale. The arrangement also makes fare collection from passengers simple, as a pedestrian park entrance gate is just across
a short footbridge from the Zion Canyon Village stop, which in turn opens right onto the Zion Canyon Visitor Center.

The shuttle system is free to use and operates on a first-come, first-served basis. Visitors can board the shuttle at any of the designated stops along the route. The shuttle runs from early morning to late evening, with the Zion Canyon shuttle operating for around ten months of the year and the Springdale shuttle operating for around eight (Zion Canyon Shuttle System, 2022).

The implementation of the shuttle system was the conclusion to a long process of planning and community involvement. It had been
a nearly 20-year effort before the implementation to slowly work to make the park and the town more friendly to one another. To create a sense among town residents that the park cared about their concerns and was part of the community, park staff would provide emergency assistance, volunteer, and participate in the town. This effort was rewarded by the park gaining a non-voting seat on the town’s planning commission to advocate for its interests.

In an unusual setup, the park and town created a joint committee to create a transportation plan for both entities. Even still, the shuttle system created many questions among town residents. Concerns – some well-founded, some borne of rumors – were plenty. A landmark town hall session saw the park superintendent
and town mayor together write on a flip chart every concern that a resident wished to have answered, and go down the list one-by-one addressing each one (Wadsworth, 2009). This cooperation with its gateway community ultimately allowed Zion National Park to better preserve the natural environment in and around the park than it may have otherwise.

Although the connection between the park and the local community exists, the Springdale-Zion area is not reachable by any transit lines, and requires guests to make the hourlong trip from St. George or several smaller communities on the east side of the park by car (Directions – Zion, 2021).
Indiana Dunes National Park

Indiana Dunes National Park protects an area along 15 miles of the southern shore of Lake Michigan stretching between the Gary and Michigan City in northwest Indiana (Indiana Dunes, 2022). Located less than half an hour’s drive from Chicago’s city limits and falling partly within the boundaries of several cities along its length, Indiana Dunes is one of the most urban parks in the system. It was originally established as a national lakeshore in 1966 and was redesignated a national park in February 2019, making it one of the newest parks (History & Culture, 2020). In an enclave within the park is Indiana Dunes State Park, which includes an additional three miles of shoreline (Learn, 2020).

Along its length, the southern boundary of the park approximately follows U.S. 20. About a mile north, U.S. 12 runs east-west across the park, while Interstate 94 runs the same route about a mile to the south (Directions – Indiana Dunes, 2021). Each of these roads connect the park directly to nearby urban centers, including Chicago, IL; South Bend, IN; and Grand Rapids, MI.

Visitors can also arrive via the South Shore Line, a commuter rail line that runs along the park’s southern boundary and stops at four stations in or adjacent to the park, including the eponymous Dune Park station. In addition to the park, these stations also serve many nearby cities, including Gary, Portage, and Valparaiso (through a connection to the city’s V-Line bus system (Route Map | V-Line, n.d.)).
The line provides a trip to Eastern Chicago in around 30 minutes, and to Chicago’s rail hub, Millennium Station, as well as the city of South Bend, IN to the east in just over an hour (Weekend Eastbound Schedule and Weekend Westbound Schedule, 2022) – fairly comparable to driving times. The line does not have any recent public data on its weekend or summertime ridership, which is when most tourism would occur.

Still, its most recent survey of morning weekday ridership, conducted in 2018 before the national park classification was granted, contains some insights. Most notably, around 23% of this morning ridership boards from one of the four stations with close access to the park, while less than three percent have them as their destination (2018 South Shore Line, 2018). This shows a couple of key facts about the
area. For one, the stations do not exist to support the park alone – a significant number of nearby residents rely on it for transportation to nearby major cities. It also demonstrates the willingness of local residents to use transit, meaning that expanding the availability of transportation to the park for nearby residents as well as visitors from Chicago would likely be a worthwhile endeavor.

The line’s proximity to the southern end of the park does pose a small obstacle to visitors, in that stations are located around a 30-minute walk away from the park’s beaches, some of their most popular features. The park’s main visitor center also has a far more convenient location for visitors by car, being located outside the park at about a 25-minute walk south of the Dune Park station. Another frustration to visitors trying to see more of the park is that, of the four stations, only Dune Park allows customers to bring bicycles (Public Transportation, 2020).

Some bus service does, however, exist for visitors arriving by train. By exiting at Miller station, the park’s westernmost station, passengers can connect on Gary’s L2 bus route, which stops within half a mile of two major park attractions: the Douglas Center for Environmental Education, and West Beach (Routes, n.d.). The park also worked with the South Shore Line to provide two shuttle routes – albeit only one connecting to the Line – in the summer of 2019 (its first summer as a national park proper) (Free Beach Shuttles, 2019). While the shuttles have not returned since COVID-19 affected operations in 2020, it is likely that the service or
something similar will return soon as the park continues to see rising visitation numbers – recreation visits increased around 50% from 2.3 million in 2020 (already a record-setting year) to around 3.2 million in 2021 (Ziesler & Spalding, 2022).

![Figure 5. A "Dune Buggy" shuttle (Kasarda, 2019)](image)

These are all the growing pains of a brand-new park still trying to find its footing in a new role. The park implemented an entry fee for the first time in March 2022, and these funds will be used to fund transportation improvements within the park (Indiana Dunes National Park entry fee, 2022). The coming several years will
likely see continued experimentation within the park to find what works best for its specific circumstances.

Next Page: Figure 6. Map of Indiana Dunes National Park
(INDU Park Map, n.d.)
Denali National Park and Preserve

Denali National Park and Preserve is located in the central Alaska Range, with park headquarters approximately 230 miles north of Anchorage and 130 miles south of Fairbanks. Visitors can reach the park by car on AK-3 (the highway between the two cities). The highway is open year-round, but services along it such as gas, food, and lodging are limited in the winter. Visitors can also reach the park by taking the Alaska Railroad to the Denali Park Station. The train runs daily from mid-May to mid-September, outside of which the train does not stop at the park (Route Map | Denali Star, n.d.). A number of small bus companies also make the trip to Denali (Directions – Denali, 2019).

Once in the park, visitors have a few options for getting around. The park road is open to private vehicles for the first 15 miles, but for the rest of the 92-mile length, visitors must use the park’s shuttle bus system. The buses run on a set schedule and make stops at major attractions in the park. As the trips are long and expensive, the schedule will change as often as every week throughout the summer. Due in part to the length, the shuttle service is also not free, charging up to $50 for the trip (Transit Buses, 2022). A full trip of the shuttle route takes over six hours each way to complete the 92-mile stretch, meaning that drivers on the last routes of the day may spend the night at the far end of the park before returning in the morning (2019 Denali, 2019).
Some scheduled buses are specially fitted camper buses, which are altered to fit much more equipment brought by campers. This allows visitors to experience farther reaches of the park for a longer time without the need to backpack in. All buses are also equipped with bicycle racks, although these may sometimes fill and lead to long waits for cyclists looking for a return trip (Transit Buses, 2022).

For a much higher price, guided tour buses are also offered. These buses offer narration and a much more curated experience, but have also lead to the downside of more of these travelers feeling unable to leave the bus to enjoy the park (Bus Tours, 2021). Between all bus services, the road will see no more than 89
buses on the typical busiest day in keeping with a 160 vehicle-per-day maximum (Denali National Park and Preserve, 2018).

The park also provides a free shuttle service between sites east of the road restriction in order to reduce traffic on these roads and assist visitors arriving at the park without a car (Free Buses, 2022).

In the small parts of the offseason where the road is clear and the buses are no longer running, private vehicles are permitted out an additional 15 miles on the road (How to Visit, 2022). Once per year, a lottery is held to allow a small number of people to bring personal vehicles all the way to the west side of the park on a weekend in mid-September (Road Lottery, 2021).

The outer half of the park road is currently closed indefinitely after ongoing landslide activity displaced around 100 yards of the park road (Pretty Rocks Landslide, 2022).
The park maintains one of the most detailed Long Range Transportation Plans. The plan lists around 80 scenario-dependent implementation actions to keep the park constantly balancing the paradox of preserving delicate wildlife and landscapes while helping increasing amounts of visitors enjoy the park and be satisfied with their experience (Denali National Park and Preserve, 2018).
Area hotels may offer patrons shuttle services. Ask at the Denali Visitor Center or the Wilderness Access Center.

The Park Road stays open to headquarters at Mile 3.4, and could be open farther into the park, based on weather conditions.
Petrified Forest National Park

Petrified Forest National Park, originally founded as a national monument, was created out of concern for damage from tourists passing through. As passengers on the BNSF line passing through would spend the night in Adamana (located just outside the edge of the park), then touring the nearby area, often with little regard for the environment. Over time, it followed much of the same story. As automobile travel popularized in the US, road trippers would drive through, first on the ocean-to-ocean highway on a section that would later become the iconic US 66, and today on I-40 (Petrified Forest History, 2007).

Figure II. Telephone poles line the original Route 66 alignment (Historic Route 66, 2018)
Guests today can still see how the park is a result of this automobile culture. The main way to reach and experience the park is by car, as the park road acts effectively as a scenic alternate route to the faster I-40 for a small section of the journey from Flagstaff to Albuquerque. Its distance from both – 200 miles west of Albuquerque and 120 east of Flagstaff – can also make it an impractical choice for a day trip from either (Directions – Petrified Forest). It is similar to many other parks this way, whose locations make them excellent pit stops for road trippers to pass through, but which often fail to carry the reputation to make them a final destination. Petrified Forest also lacks the facilities to operate as a major destination, as there are no developed camping areas inside park boundaries, and any multi-day visitors will need to find campsites nearby or obtain backcountry camping permits (Camping, 2022).

The park’s nature as a drive-through attraction rather than a destination, or even a there-and-back experience, makes it much more difficult to operate any sort of transit system within the park. Additionally, its low visitation and long distance from nearby cities means that operating long-distance transit to the park would likely not be reasonable. If the park were to find success implementing a shuttle line, it would likely either come with an emphasis on acting as a shuttle for campers staying outside the park – which may not have the passenger volume to support such a system – or come with closing part of the park road – a move which
could discourage visitors and upset the economy of Holbrook with fewer vehicles passing through.

Figure 12. A petrified log breaks at Crystal Forest (Holgerson, n.d.)

Next Page: Figure 13. Map of Petrified Forest National Park (PEFO Park Map, n.d.)
Pinnacles National Park

Pinnacles National Park is located in central California and is known for its unique rock formations and cave systems. The titular pinnacles are a part of the Gabilan Range, which extends from around King City in the south to San Juan Bautista in the north.

There are two entrances to Pinnacles National Park. The east side is located near the town of San Benito, while the west side is near Soledad. While both entrances are served by CA-146, the road does not go all the way through the park, leaving about a three mile gap that is only traversable on foot. Instead, to reach the other side of the park, visitors will have to drive an 80-minute route through King City (Directions – Pinnacles, 2016).

Figure 14. Rock spires along High Peaks (How Pinnacles Formed, 2020)
The park has experienced major struggles with high visitation traffic since it was redesignated as a national park in 2013. Visitors to the more developed, more accessible, and more popular east side will find limited parking inside the park, and often the designated overflow area will fill as well, leaving visitors waiting to enter the park (Reynolds, 2022). The park operates a weekend shuttle from the visitor center/overflow lot to the two major trailheads so that visitors will not need to add the 3-mile walk each way to their journey (Operating Hours, 2022).

There is no public transportation to Pinnacles National Park. Visitors from San Jose – the nearest major city – will need to drive around 80 miles south to the park.
Most of California 146 is winding and one and a half lanes wide (in some places only one lane wide) and NOT recommended for RVs, large vehicles, or trailers.

Drivers note: California 146 is not a through road. No roads cross the park.
Isle Royale National Park

Isle Royale, from which Isle Royale National Park takes its name, is an island of around 200 square miles in the middle of Lake Superior. Vehicles are prohibited within the park, and visitors are mostly only able to traverse the island by foot on the park’s 165 miles of hiking trails (First Timers Guide, 2022). There are also a few roads in the island’s two main settlements, Rock Harbor and Windigo, which are used by golf carts – only available to those with accessibility needs – and bicycles (Accessibility, 2022).

Figure 17. The Ranger III Ferry (Ferry Transportation Services, 2021)
To reach the island, visitors can catch a ferry to the island from the mainland, an experience that can last anywhere from two to six hours. These ferries mainly take guests to Rock Harbor and Windigo, although some make stops at smaller docks around the island as well. Guests can also book a seaplane flight to the island or arrive by private boat (Directions & Transportation – Isle Royale, 2022). Once on the island, visitors can rent kayaks or canoes to explore the island’s lakes and waterways (Canoeing & Kayaking, 2022).

Next Page: Figure 18. Map of Isle Royale National Park (ISRO Park Map, n.d.)
RECOMMENDATIONS

No two parks exist under the same circumstances. As one might expect, attempting to apply the same solutions universally would not result in a transportation network that adequately improves the guest experience and preserves the natural environment. However, these cases bring to light several goals which successful parks have often met. These goals closely align with usual transportation and planning best practices. This is highly appropriate, given that most parks need to serve as communities during tourists' stays, and that many also act as a part of neighboring towns.

1. Coordinate planning efforts with local communities.

   Transportation is all about the movement from one place to another. Most, if not all, park traffic will have trips that originate, pass through, or end in a nearby community. Most visitors to the Petrified Forest will also pass through Holbrook, and most multi-day guests at the park will spend their evenings in the town. By allowing the park to operate as an extension of the town and park staff to integrate into the community, a park can better meet its own needs by working with similar concerns that affect its neighbors.

2. Create alternatives to private vehicles.

   Visitors come to most national parks for an opportunity to enjoy being outdoors. When available, guests will often take walking or biking alternatives to
shorter drives. Many will also gladly take shuttle services to see the natural beauties, or just as an opportunity to relax outside of the cramped car.

3. Share travel information with visitors in a clear manner.

The best park transportation systems thrive on guests being aware of what options are available to them. Visitors are only able to take advantage of what they know is available to them. Guests wait in long lines to board Zion’s shuttle because they know that it exists, what it does, and what awaits them.


As tourist destinations and large natural areas, national parks are often subject to rapid changes. In some parks, visitation has been known to unexpectedly double over just a couple of years, and with no plans in place to immediately deal with expansion, parks may be caught off-guard for years as existing systems are stretched past capacity. Conversely, if a park sees a sudden decline in visitors, they may be spending resources to keep underutilized systems in place.

In areas that are naturally delicate, unexpected circumstances are also likely to arise from time to time. Roads and trails may occasionally need to close for flooding, landslides, wildfires, or dozens of other reasons. While park guests are usually prepared to hear about road closures, long delays in repair can significantly impact park programming and active conservation efforts.
WORKS CITED


