Transit for National Parks and Gateway Communities: Impacts and Guidance

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Transit for National Parks and Gateway Communities:
Impacts and Guidance

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DEDICATION

For Michael Meyer here,
This book must go. It's clear.
Above the rest, he's reached a crest
And to my soul endeared.

No other could have won
My work because my con-
fidence was gone and I'd moved on…
With academe was done,

But Mike gave me support
When I had no resort.
He'd seen it, too, and so I knew
That he could help me sort
Through what I'd seen. What did it mean?
Mike did (of most import)
Give of his time when I'd need find
Some justice in his court.
He gave an ear when naught was clear.
With wise man's sage, he heard me rage.
In storm, he gave me port.

Though eighteen years between
Us typically would mean
He'd hold things back and simply stack
My point of view unseen,
Instead, he gave me heed,
Respecting me indeed.
I'd proof his work. He'd seek my quirky
View as if a colleague's gift
I gave, and he'd give creed.

Mike set a standard high
For interactions. I
Will now endeavor
To be so clever:
Actions observed, treatment deserved.
Show strengths respect; growth detect.
Hear with perception. Fight all deception.
Provide the space to thrive and ace.
Give true support; their passions, court.
Help others now to fly.

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NOMENCLATURE

Acadia	Acadia National Park
Bryce Canyon	Bryce Canyon National Park
Cape, the	The geological cape and political area of Cape Cod
Denali	Denali National Park and Preserve
Georgia Tech	Georgia Institute of Technology
GIS	Geographic information systems
GPS	Global positioning systems
Hot Springs	Hot Springs National Park or the City of Hot Springs
ITS	Intelligent transportation systems
NAICS	North American Industrial Classification
NPS	United States National Park Service
Park Service	United States National Park Service
Rocky Mountain	Rocky Mountain National Park
RV	Recreational vehicle
Seashore, the	Cape Cod National Seashore
SIC	Standard Industrial Classification
U.S.	United States
Yosemite	Yosemite National Park
Zion	Zion National Park

GLOSSARY

Capacity: Vehicular capacity indicates the number of vehicles that can be in a defined place at one time.

Bus Capacity: Bus capacity indicates the total number of people who can ride the bus at a single time. Beyond the count of seats available, bus capacity can expand if people are permitted to stand. Wheelchairs might reduce the number of seats available for typical passengers.

Roadway Capacity: Roadway capacity indicates how many vehicles a road can accommodate in a given amount of time. Terrain, speed limits, points of access to parking lots and driveways, on-street parking, and large vehicles all reduce the amount of throughput a roadway can accommodate.

Parking Capacity: Parking capacity refers to the number of vehicles that can be accommodated at a given time. Because vehicle sizes differ, parking capacity for passenger vehicles might include no spaces to accommodate large recreational vehicles. The specific capabilities and accommodations must be considered in discussions of parking capacity; however, most discussions of parking capacity refer to the number of passenger vehicles that a parking area can accommodate.

Transit Capacity: Transit capacity considers both the number of passengers who can ride on a vehicle (either standing or sitting) and the number of vehicles that serve a destination. Capacity represents the total number of people who can reach the destination by transit as the product of the number of vehicles by the number of spaces per vehicle.

Chamber of Commerce: Chambers of commerce are associations of businesses in a given area. For gateway communities, local chambers of commerce often serve as visitors' bureaus, as well.

Deadhead: Deadheading occurs when transit trips carry no passengers. Deadhead trips typically occur between a bus depot and the start point of a route or between a transit route and a fueling station.

Demand: Demand for transportation indicates the total number of trips people would like to take. In terms of roads, vehicle counts typically indicate demand. For transit, the total number of people who want to ride shows demand. Analysis cannot determine unconstrained demand under crowded conditions because traffic levels or packed transit vehicles deter some people from taking trips. Proxy measures also fail to give accurate indications. For instance, demand for transit can be higher than the number of visitors to a park because demand for transit represents how many trips people want to take by transit, rather than the number of people who ride transit, and a count of trips is different from a count of people. Any given person might want to take two or more trips by transit. *See also supply and capacity*.

Depot: Depots serve as the end point of transit routes where vehicles begin and end the day. Depots often have capability for fueling and some maintenance.

Direct Effect: When examining economic impacts, direct effects indicate the amount of public spending. *See also indirect effect and induced effect.*

Farebox Recovery: Farebox recovery reflects the percentage of operating costs that a transit system earns in fare revenue. Often, rural transit systems only recover 25 percent of their operating costs in fare revenue.

Fixed Stop: Fixed stops are locations where transit routinely allows passengers to board or disembark. *See also flag stop.*

Flag Stop: A bus makes a flag stop when the driver reacts to the request of a passenger. Flag stops might occur at fixed locations, or they might occur in places that passengers request along fixed routes. *See also fixed stop.*

Frequency: The frequency of transit service indicates the number of vehicle departures per hour. Frequency is the reciprocal of headway. *See also headway.*

Gateway Community: This research considers gateway communities to be the communities adjacent to or near public lands. Often, gateway communities depend on tourism as a major contributor to the local economy.

Headway: The headway of transit service indicates the amount of time between vehicle departures. Headway is the reciprocal of frequency. *See also frequency.*

Indirect Effect: When examining economic impacts, indirect effects indicate the amount of money spent more than once in the study area. For example, if the public spends one dollar at a restaurant and the restaurateur spends forty cents of that dollar at the local grocery store, the forty cents represent an indirect effect. *See also direct effect and induced effect.*

Induced Effect: When examining economic impacts, induced effects indicate the amount of money spent in the community that goes to local wages. For example, if the public spends one dollar at a restaurant and the restaurateur pays employees thirty cents of that dollar, the thirty cents represent an induced effect. *See also direct effect and indirect effect.*

Intelligent Transportation Systems (ITS): Intelligent transportation systems encompass the use of technology to facilitate transportation operations. Typical implementations of intelligent transportation systems in parks might include, but not be limited to, variable message signs indicating real-time parking availability or bus arrival information, automated transit ridership counts, vehicle tracking through global positioning systems (GPS), and weather detection and communication systems.

Interpretation: The National Park Service considers interpretation as the specific function of relating information about local attractions to visitors. Parks hire people specifically for the purpose of interpretation to provide educational programs for visitors and to answer questions about the area. Private bus tour operators often distinguish their products from transit service on the basis of interpretation offered, among other factors.

Passenger: *See rider.*

Peak: Peak indicates the time of greatest demand.

Peak Season: Peak season refers to the months of the year when the most visitors go to a recreational area. Peak season typically occurs in the summer months of June, July and August in the United States when school children have summer vacations and families travel. The length of peak season varies from park to park; weather and climate usually determine the time and duration of peak seasons. *See also shoulder season.*

Peak Hour: The highest activity of the day occurs at peak hours. For restaurants, traditional meal times bring peak hours of activity. In urban areas, peak hours for

traffic occur around traditional commute times. In recreational areas, peak hours for traffic and riding transit often occur around events, meal times, and sunset.

Presence: Presence indicates the degree to which transit is incorporated into visitor experience. As one aspect of presence, service identity and visibility make a transit system recognizable with its logos, vehicle design, stop design, and so forth. Equally importantly, presence captures how visitors see transit as part of their experience in a recreational area. If people tell their friends, "When you go to that park, you have to ride the signature bus," that transit system has a large presence. As an example of a bus with strong presence, the Red Bus of Glacier National Park appears in most brochures as an activity that would appeal to visitors as a signature experience, and when the buses went out of service for reconstruction in 1999, people complained that they did not see the buses running.

Public Transportation: *See transit.*

Rider: A rider is a person who boards transit. Riders are sometimes called passengers.

Ridership: Ridership indicates the aggregate number of rider boardings on a transit vehicle or route over a defined duration of time. Rather than indicating the number of people who have used transit, ridership represents the number of trips. One rider can make several trips and appear several times in a ridership count.

Shoulder Season: Leading into peak season, visitation in recreational areas increases from low numbers of visitors in the off season to the high visitor count of the peak season. Similarly, after the peak season, the time in between peak season and low season has a moderate number of visitors. Shoulder seasons refer to the times of

moderate visitation when the visitor count ramps up and when it dwindles around a peak season. *See also peak season.*

Shuttle: *See transit.*

Staging Area: People gather to board buses at staging areas. Staging areas typically refer to a major gathering point, such as a park and ride lot, rather than a simple bus stop along a route.

Standee: A standee rides transit in a standing position while a transit vehicle is in motion (usually because of a lack of availability of seating).

Stop or **Transit Stop:** Stops are locations where transit allows passengers to board or alight. *See also flag stop and fixed stop.*

Supply: (compare to *capacity* and *demand*) Supply, in terms of transit, indicates the amount of service available. Beyond the capacity of a single vehicle, transit supply also indicates the frequency of routes, and if more than one vehicle travels on a route at one time, the supply increases. In some parks, operators increase transit supply by attaching trailers onto buses.

Tour, Tour Bus, or **Tour Service:** Tours offer private or public transportation service that typically has extensive interpretation, an advance reservation system, one group moving together for a set period of time (such that the vehicle waits for the same group to re-board after visiting a stop), private sector pricing to cover the costs of the service, and a private sector profit motive. *See also transit.*

Tourist: A tourist visits an area for the purposes of sightseeing or recreation

Tourism: Tourism identifies the industry associated with visitors and the businesses, services, agencies, and organizations catering to them.

Transit (also Shuttle or Public Transportation): This term describes public transportation service that typically has limited or no interpretation, no advance reservations, scheduled service where passengers board whichever vehicle arrives first at the transit stop, public sector subsidy to lower fares or make service free, and public goals, such as economic development, congestion mitigation, public mobility, or environmentally friendly transportation alternatives. *See also tour.*

Visit (*1*): For purposes of public-use data collection, the National park Service defines a visit as the entry of any person onto lands or waters administered by the National Park Service

Visitation: Visitation represents the aggregate number of visits to a park over a defined duration of time, usually discussed in terms of a monthly or annual number of visits.

Visitor (*1*): For purposes of public-use data collection, the National park Service defines a visitor as an individual who generates one or more visits.

Visitor Center: A visitor center provides information for visitors about a local area or a local attraction. The National Park Service provides visitor centers near the entrance to most parks to orient visitors to park attractions, amenities, and services, such as transit. Local visitor centers supported by chambers of commerce and visitors bureaus typically offer information on local tourist-related businesses, as well.

Visitors Bureau: Visitors' bureaus provide information on lodging, restaurants, services, and retail businesses that cater to tourists, as well as local attractions. Visitors' bureaus allow local business owners to gather to take advantage of the economies of scale provided by consolidating information on all of the local offerings. *See also chamber of commerce.*

(*1*) National Park Service, “Director’s Order – 82: Public Use Data Collecting and Reporting Program,” draft, August 8, 2001, http://www2.nature.nps.gov/stats/do_82.pdf.

SUMMARY

Introduction

The traffic congestion that has grown into a major public policy issue in U.S. metropolitan areas has also become a significant issue for the U.S. National Park Service. Traffic problems threaten both of the National Park Service's core missions: to preserve and protect the resource and to provide for the enjoyment of visitors. Traffic congestion, corresponding vehicle emissions, and inappropriate parking can cause significant damage to natural resources and contribute to a compromised visitor experience.

In response to growing congestion problems, the National Park Service has implemented transit service in some national parks; however, some local communities have speculated that proposed transit service might negatively impact visitation patterns and transportation circulation, which would potentially create important consequences to the communities themselves. Businesses that have emerged to cater to park visitors have typically developed in environments dominated by private vehicle transportation. With the introduction of transit, visitor travel patterns and behavior can change. This change could represent a new market for local entrepreneurs, or it could negatively affect business activities. Park managers and community leaders need information and guidance on the potential impacts of transit in these recreational areas.

Based on past experience with transit in national parks, this research has developed a recommended approach for transit planning in national parks. The first goal of the research was to develop an understanding of the impacts associated with the introduction or improvement of transit service in national parks and gateway communities, those

communities that serve as major entrance points to the national park. The second goal of the research was to recommend procedures for monitoring the local performance and impacts of park and gateway community transit systems.

This research emerged from a case study methodology involving on-site interviews, direct observation, and review of public documents, addressing two primary research question categories:

- What has been the experience when transit services have been introduced in national parks? To what extent have people visiting or living in surrounding areas changed their travel patterns based on the availability of transit? What impacts have been felt in gateway communities?
- How can parks implementing or planning to implement transit service understand and benchmark their local experience? How can transit service organizers monitor transit service performance and the economic impacts of local transportation strategies?

Methodology

This report frames the research findings in terms of inputs, outputs, and outcomes of transit service. For the first goal, inputs for recently implemented transit services include partnering practices, funding, and other planning inputs that defined transit service. The service outputs comprise the service frequency, route structure, and other operational characteristics. The outcomes relate to how transit service manifested into changes in visitation patterns, visitor spending, gateway community structure, and so forth. For the second goal, the results of case study findings lead to recommendations on how transit

system organizers can use desired inputs to lead to transit service outputs that will result in outcomes that coincide with local goals.

A review of literature and past experience showed that the question of transit's impacts on local economies required a unique analytical approach. Input-output analysis and other regional methodologies typically applied to questions on the impacts of park actions would not address the question of impacts related to transit service factors that could affect small gateway communities. The case study methodology employed in this research sought knowledge from local public, private and not-for-profit community leaders so as to depict the impacts of transit as perceived by these groups, to relate how transit service met or fell short of local expectations, and to identify the inputs of transit planning that yielded the results.

Seven case study sites of parks and their gateway communities — at Acadia National Park, Bryce Canyon National Park, Cape Cod National Seashore, Denali National Park and Preserve, Hot Springs National Park, Yellowstone National Park, and Zion National Park — served as the major source of data and information supporting this research. These parks sit in non-urban areas, represent most of the regions in the national park system, receive over one million visitors annually, and use land-based transit service that has undergone substantial changes in recent years. Goals for transit service varied from one site to another, but most goals aimed at reducing traffic and parking congestion, improving safety for visitors, and mitigating environmental impacts due to increasing numbers of visitors. Data for the case studies came from site visits, interviews with stakeholders, public documents, and archival records. The results of the case studies illustrated the types of planning and decision making processes that led to service

implementation, the service outputs, and targeted outcomes, such as visitor behavior, economic impacts, and other results that occurred due to the introduction or modification of transit service.

Research Results

The following research results are organized in the framework categories of inputs, outputs, and outcomes described earlier.

Planning and Decision-making Inputs

Although service **goals** for transit systems can vary from location to location, this research identified several primary goals for park transit, namely:

- Transportation: Improve traffic circulation, solve parking problems, and reduce perceptions of crowding
- Safety: Increase motor vehicle-related safety, including reducing vehicle/non-motorized transportation collisions
- Environment: Mitigate environmental impacts from motor vehicles

Other goals identified in a 2001 study of transit needs for federal lands include (*2*):

- "Enhancing visitor mobility and accessibility;
- "Preserving sensitive natural, cultural, and historic resources;
- "Providing improved interpretation, education and visitor information services;
- "Reducing pollution; and
- "Improving economic development opportunities for gateway communities."

Design and implementation characteristics of transit service often follow from system goals, with resulting impacts dependent on how transit service is implemented.

Partnering among different governmental entities and private sector groups provides decision-making support and financial contributions for transit systems. Strong partnerships, defined as long-lasting and responsive to inputs from major influence groups in the communities, appear to correlate with high ridership on shuttle systems. Because gateway communities typically contribute financial support for local shuttle service, **transit finance** strategies can affect local economies and governmental budgets. Important case study observations with respect to transit system finance include:

- Most local stakeholders initially did not realize that **fare revenue** can at best cover only a fraction of the expenses of proposed transit service. Given that all of the shuttle services in the case studies required subsidies, some transit system organizers decided to give full subsidy and eliminate fares. In some cases, experiments with park transit systems showed that fare-free systems attracted more riders, helping to achieve many of the concomitant transit goals of transportation mobility, environmental quality, safety, and so forth. As a contrasting fare strategy, some system organizers recognized that introducing fares to a historically fare-free system disgruntles the public, so operators charged fares from the start of transit service as a strategy to avoid subsequent difficulties in introducing fares.
- Park financial contributions for transit services came from park **entrance fees**, and special legislation now allows parks to tack a **transportation fee** onto these entrance fees. Whereas part of park entrance fees goes to the National Park Service in Washington, D.C., transportation fees pay strictly for transit. Transportation fees work well when people pay entrance fees, but experience has

shown that visitors who present annual passes in lieu of entrance fees will not willingly pay transportation fees.

- Introduced in 2000, just when many shuttle systems came online, the **National Parks Pass** has changed the financial environment for several case study parks. In particular, Zion and Bryce Canyon have found that a large number of the projected visitors they had expected to pay transportation fees, instead, are presenting the National Parks Pass; therefore, revenue in these parks has fallen short of covering the cost of transit service. It appears that parks in close proximity to other parks feel the effects of the National Parks Pass more than parks found in remote locations.
- Gateway communities have developed individualized schemes for providing **local contributions** to transit service, primarily through general community budgets, business user fees, or transportation funding allocations.
- **Philanthropy** has proven highly effective in some situations for providing a foundation for transit finance; however, establishing a substantial philanthropic financial base requires several years of planning.

Transit costs are typically divided into capital and operating costs. The National Park Service has strongly supported transit with **capital funds** for infrastructure and rolling stock, but many of the case study parks had not established a plan for replacement of rolling stock. Many gateway communities have neither funded bus stop infrastructure nor established consistent design guidelines. A few private businesses have taken initiatives to provide necessary infrastructure in front of their businesses. The National Park Service has a difficult time planning for **operating funds** because no ongoing

funding mechanism currently supports transit in parks. In most cases, transit services began without a clear strategy for obtaining future operating funds, and some transit systems are now struggling. Budget structures have exacerbated the problems of providing stable and consistent funding support for transit. Park budgets can more easily fund capital than operating expenses, which means it is easier to replace a road than to perform less expensive annual maintenance that in the long run would be the more cost-effective strategy.

Services and Strategies as Outputs

The case studies revealed wide variation in transit outputs. Some systems started with ambitious **scopes of service** intended to capture almost all visitor trips, whereas some transit plans aimed at a more modest beginning with potential for future growth. The extent of route systems, availability of seats on buses, and frequency of service all affected the appeal of transit service. Many of the transit system organizers in the case studies did not seem to understand the sensitivity of the traveling public to changes in these characteristics of service.

In some cases, transit system organizers hoped to replace almost all private vehicle trips in certain park areas with **private vehicle restrictions**. The concept of restrictions generates concerns and debate. For parks having such restrictions, case study interviews revealed that most stakeholders felt they were needed; however, stakeholders having strong familiarity with the recreational areas often identified ways that they individually could get around them (traveling off-season, obtaining special passes, visiting unrestricted areas, or creating facilities with special privileges for local residents) in

much the same way that people familiar with crowded areas find ways to avoid congestion.

In many cases, stakeholders hoped visitors would use transit to **substitute for trips** made in oversized recreational vehicles. Interviewees in several parks indicated that recreational vehicle drivers readily use transit and leave their oversized vehicles parked.

The **design of bus stops** received differing levels of attention. Bus stops in recreational communities with many travelers unfamiliar with the area need to make transit service use intuitive. Flag stops, where bus riders must request the driver to stop, typically do not work well in these situations.

Parking strategies substantially shape the way that visitors interacted with transit systems. Parking strategies affected local economies and park budgets in terms of infrastructure construction cost, site purchase or lease, operating costs for routing buses to parking areas, economic opportunity for businesses served (or not served) by transit, parking fee revenue, parking enforcement revenue, and opportunity costs for visitors who choose to avoid areas with insufficient parking availability. **Route structure** determined which businesses received the benefit of front-door service. A well-planned route structure made transportation seamless, accommodating all visitor needs, including connections to regional transportation providers.

Most stakeholders undervalued the impact of **intelligent transportation systems (ITS)**, but survey results from other research has indicated that people will choose to ride shuttles after seeing real-time bus departure information: they feel such information saves them time. Survey responses also indicated that ITS users visit park regions for longer than non-ITS users; however, the survey responses do not identify whether people who

stay longer use ITS or people who use ITS stay longer (*3*). ITS, bus stop infrastructure, identifiable transit vehicles, and various types of media all create transit's **presence** in the eyes of visitors, which helps build confidence in riding the bus.

The case studies showed that most transit system organizers underrated the importance of **communication**. Many stakeholders felt that negative media portrayal of park transportation issues has scared visitors into finding other vacation destinations, thus how media portrays park transportation importantly affects overall visitation. Information for the visiting public typically falls short of full visitor needs. The general public sometimes has no easy access to schedules, maps, or the dates of shuttle operation; furthermore, front-line employees in gateway community businesses do not feel have proper training and information to answer visitor questions about shuttles. Better dissemination of information could make tourists more comfortable with the idea of visiting popular park regions and riding shuttles.

Outcomes of Transit Service Initiatives

Traffic congestion mitigation might simply mean averting an increase in traffic as visitation increases, rather than decreasing the actual number of vehicles on local roads. As found in the case studies, mitigating traffic problems in one location might simply shift them to another location. Transit must work in conjunction with other aspects of a comprehensive transportation plan to realize overall transportation improvements.

Does the presence of transit affect the number of visitors to parks and gateway communities? Every visitor lost or gained represents a change in visitor spending for local economies, so this question interests many local stakeholders. Data from the case study parks indicated **no clear effect of transit on visitation**. The mere presence of

transit fails to predict visitation trends. Many other external factors appear to have had a stronger effect on the fluctuations in visitation; however, indirect effects can be hypothesized. For instance, parks might gain reputations as attractive destinations over time because of their managed traffic, but current visitation data cannot speak to such effects. Data indicate that tourists do not stop visiting parks that have **private vehicle restrictions**. Other economic impacts of the restrictions appear to be similar to the economic effects of shifting people from private vehicles to transit.

Ridership trends vary. The mere presence of a shuttle service does not guarantee strong or weak ridership. Where some routes specifically serve gateway communities and connect to routes serving park destinations, a core ridership has appeared. In these case studies, this core ridership represented a small proportion of total visitor trips, which indicates that most people still traveled by private vehicle; in such cases, visitor access to gateway community businesses has changed little. Although the effect of circulation changes has had little impact on businesses, even a small portion of trips made by transit can create a meaningful improvement in traffic conditions.

Many of the case studies showed similar **characteristics of transit riders** and **transit ridership**. For instance, foreign tourists readily rode buses, compared to domestic visitors. Regardless of country of origin, people traveling by recreational vehicle found the bus more convenient on local roads than their oversized personal vehicles. Bus riders in some cases used the service for work purposes or to access local businesses. For example, commuting employees, shoppers, and diners each have established a presence on the Island Explorer at Acadia National Park. Commuting employees can provide a consistent base ridership year-round, and removing employee cars from local roads

lowers traffic congestion at peak times while freeing parking spaces for other users during the entire day.

Transit brought **direct employment opportunities** to gateway communities, as well. In some cases, local residents obtained a commercial driver's licenses as a benefit of employment. In other situations, local areas had a supply of trained and licensed drivers, such as school bus drivers who wanted to continue to work in the summer. The attractiveness of driver wages varied, as the wages for some services surpassed surrounding county averages, while other systems found that the offered wages failed to attract drivers or create job loyalty.

Some gateway community businesses have experienced a **shift in demand** for operating hours, based on the convenience of bus riders. Some demand has also shifted away from the retail sector toward service industries for visitors. Lodging and restaurant owners would like to see transit help people decide to stay in the local area longer, but no evidence of this behavior has yet developed in the early years of the case study systems.

Gateway community businesses also often **absorb some of the costs** of offering transit. Financial strategies likely favor large versus small businesses or perhaps lodges over retail shops. Case study transit system organizers distributed the costs and benefits of transit in different ways. Overall, it appears that businesses with front-door bus service will feel economic benefits most during shoulder seasons when visitor activity slows and visitors can choose where to spend their money based on amenity, rather than on concerns about lodging availability.

Transit system organizers downplay the effect transit has on **private transportation operators**, such as tour bus companies and taxi cab operators. While distinctions between

tours and shuttles exist in theory, the distinctions blur in reality. Private operators report that they do lose customers to shuttles, but these providers also recognize benefit from reduced traffic and the potential for more visitors (prospective customers) to visit the area if the congested private vehicle infrastructure ceases to limit the number of people who can enter and circulate recreational areas during peak seasons. While private transportation providers recognize these competing influences, the ultimate effect of public transit on the bottom line for private transportation providers remains unclear.

Inside parks, some **concessioner operations** benefit from shuttles bringing visitors directly to businesses, but some concessioner businesses have experienced negative effects from shuttles. The experience for a given concessioner appears to depend upon the type of business and the business methods historically used.

Economic developers have used park transit to support existing businesses and to attract new businesses. Transit can further assist in expanding businesses in places where constrained private vehicle infrastructure, such as overcrowded parking lots, limits business growth. Outside Denali National Park, for example, an elaborate commercial area has developed where half of the tourists depend on transit service.

Familiarity with transit service has changed **public reaction** from skepticism to acceptance in many cases. Despite the identified benefits that transit has brought to gateway communities, most stakeholders admitted they held reservations about the idea of a shuttle until they saw it running in their own communities. Similarly, many interviewees expressed skepticism over the usefulness of intelligent transportation systems, although survey results have found that the general public quickly understands the technology and finds it useful for traveling in a recreational area.

Recommendations and Guidance

This research has shown the importance of service goals as the basis for the assessment of the impacts of transit service in national parks. Impacts either represent progress (or lack thereof) toward goals or externalities assumed in the pursuit of those goals. Resource allocations and system design follow from goals, and this context defines how to interpret the data obtained from performance monitoring of impacts. The performance monitoring system for national park and gateway community transit service that emerges from this research follows several steps:

1. Identify partners and stakeholders; design a public involvement strategy
2. Define and address goals and objectives according to stakeholder interest
3. Select performance measures and develop consensus
4. Design the transit system and communication program
5. Consider available resources
6. Test and implement the performance monitoring program
7. Monitor and report performance
8. Integrate results into transit decision-making
9. Review and update the program

This approach provides structure to the collection and analysis of information on intended impacts and externalities. Performance monitoring should start with a baseline before the initiation of transit changes, and should continue at regular intervals thereafter. Transit system organizers need to program funding for ongoing programs, and multiple stakeholders need to contribute to the review efforts. Beyond normal data collection and analysis procedures, stakeholders need to examine closely community policies that can

affect transit service impacts. For example, land use, real estate, traffic, and parking policies can strongly influence the ultimate impacts of transit service.

Many issues relating to transit service in national parks and in gateway communities remain unexplored. Future research should continue to refine the understanding of local impacts of transit in parks. Park funding and the allocation of resources need thorough examination to ensure that resources go to the most important aspects of transit. In general, park and transportation professionals will benefit from information that offers a broader understanding of transportation project planning for public lands and the context and history of public land transportation.

Conclusion

Understanding the impacts of transit in parks requires a sense of the context and intent for each given transit service. Many parks need some form of transit service, but the goals and other planning inputs will likely vary.

This report presents the most comprehensive findings available on the subject of transit service impacts on national parks and their gateway communities. This research has contributed:

- An examination of past economic impact studies and an identification of the reasons why traditional economic impact methodologies fail to capture the economic impacts of transit in parks on gateway communities,
- A methodology for characterizing gateway community economies and how transit will affect them with sensitivity to distance from transit stops,
- A conceptual model for considering how to approach analyzing various types of outcomes from transit in relation to inputs contributing to transit systems,

- An evaluation of the impacts of transit in existing situations, analysis of contributing factors, and recommendations for mitigating negative impacts and enhancing positive outcomes,
- Identification of critical factors affecting how transit impacts national parks and gateway communities,
- Guidelines for monitoring the performance of transit according to the goals established for individual systems, including economic effects on local economies,
- Recommendations for best practices according to the contexts where they fit, and
- Directions for future research to refine understanding of the impacts of transit and to improve service efficiency, quality, and visitor experience.

Rather than asking what impacts transit can be expected to generate, transit system organizers should articulate the types of impacts and outcomes they intend to create. Goals formed in local contexts need to balance the interests of different stakeholders and the tradeoffs inherent in pursuing any given goal. A performance monitoring system will give ongoing critical information on progress made toward goals, the associated costs, and the external effects generated. Transit planning, management, and operations can use this information to work more efficiently and achieve progress toward desired context-sensitive outcomes of transit.

(*2*) Cambridge Systematics, Inc. and BRW Group. *Federal Lands Alternative Transportation Systems Study: Congressional Report*, prepared for the Federal Transit Administration and the Federal Highway Administration, 2001. http://www.nps.gov/transportation/alt/ats-study/ats-study.pdf

(*3*) Daigle, John and Zimmerman, Carol. *Acadia National Park ITS Field Operational Test: Visitor Survey*, prepared by Battelle for the U.S. Department of Transportation ITS Joint Program Office, February 10, 2003.

1.0 INTRODUCTION

Road congestion in U.S. metropolitan areas has become a major public policy issue. Depending on the metropolitan area, congestion is often ranked in public opinion polls as being either the first or second most important issue facing the region. As the number of visitors to national parks has increased dramatically over the past several decades, not surprisingly, road congestion has also become a significant issue for the U.S. National Park Service. Traffic problems threaten both of the National Park Service's core missions: to preserve and protect the resource and to provide for the enjoyment of visitors. Traffic congestion, corresponding vehicle emissions, and inappropriate parking can damage natural resources and contribute to a compromised visitor experience. .

As the National Park Service has implemented transit services in some national parks, local communities around these parks have grown concerned about how changing visitation and transportation patterns will affect them. National parks create economic opportunities in local communities and along routes of access. The businesses that have emerged to cater to park visitors have typically developed in an environment dominated by the private vehicle. With the introduction of transit, visitor travel patterns and behavior could possibly change. This change could represent new market opportunities for local entrepreneurs, or it could negatively affect business activities. Because of this sense of opportunity in some cases and concern in others, local leaders of several gateway communities have contacted park officials to make a voice for themselves in the planning of park transit services. Park managers and gateway community leaders need information and guidance on how such planning should occur.

The first goal of this research is to develop a comprehensive understanding of the impacts encountered where transit access has been implemented or improved in national parks and gateway communities. The second goal is to recommend procedures for monitoring local performance and impacts of park and gateway community transit systems. These procedures will help park managers understand and plan for the impacts of transit service. The analysis methodology defines a data collection procedure that should occur before and after transit service implementation.

1.1. Research Questions

The impacts of new or enhanced transit service on recreational visitor travel behavior and gateway community economies have not been examined in a comprehensive manner. Two important types of research questions, which this research addresses, have been particularly missing from the literature:

- **What experience has already occurred with transit service in national parks? To what extent have people visiting or living in surrounding areas changed their travel patterns based on the availability of transit? What impacts have been felt in gateway communities?**

These questions relate to the actual experience with transit in parks and gateway communities. As a precursor to understanding the impact of transit on gateway communities, these questions address the need to establish a base understanding of how well transit systems serve the needs of people in national parks and gateway communities and how people are responding to such service.

Examination of economic impacts involves two questions: are people more, less, or equally likely to visit parks if they know the park has a transit service; and, what has happened to businesses in cases where transit service has been introduced into parks and gateway communities? For these questions, both actual impacts and the impacts perceived by local community leaders need to be understood. Economic impacts can occur in several different ways, such as revenue generation, employment growth or redistribution, and shifts among industries. External factors, such as national trends in tourism, need to be identified for their relative contribution to the impacts experienced locally.

- **How can parks implementing or planning to implement transit understand and benchmark their local experience? How can they monitor transit performance and the economic performance of local transportation strategies?**

This second set of research questions relates to how parks and gateway communities implementing transit can better understand the dynamics of successful operation and how they know if they are achieving their goals or if negative impacts could be avoided or mitigated. This area of exploration requires the identification of typical transportation-related goals of parks and gateway communities, as well as performance measures that can best indicate progress toward reaching these goals.

Answering these research questions will help identify best practices that transit planners can use in considering local goals achievement.

1.2. Methodology

This research examined the impact of new or recently modified transit services at seven national parks and gateway communities. The case studies were selected through a detailed selection process reflecting important characteristics of the national parks' transportation experience. Other selection criteria included geographic location and visitation levels. Local stakeholders with various interests (representatives from the towns, parks, and transit operators) were interviewed to determine the overall impact of transit on different segments of the local communities and on local regions for each park. Information for the case studies came from a combination of interview results, public documents, direct observation of how the transit system service the local environments, and archival data on visitation and travel patterns.

1.3. Conceptual Framework

Figure 1-1 presents the conceptual framework that guided this research and organized the presentation of the research results. This framework identifies four major elements to the research design. First, inputs lead to the implementation of transit services, which in the case study national parks consists of various elements hypothesized to be important to the types of strategies and services implemented. For example, one of the important points of departure for any planning process is identifying the goals and objectives that provide the rationale for the steps that follow, thus one of the important variables in the research design was identifying the goals and objectives adopted by the transit organizers in implementing new services.

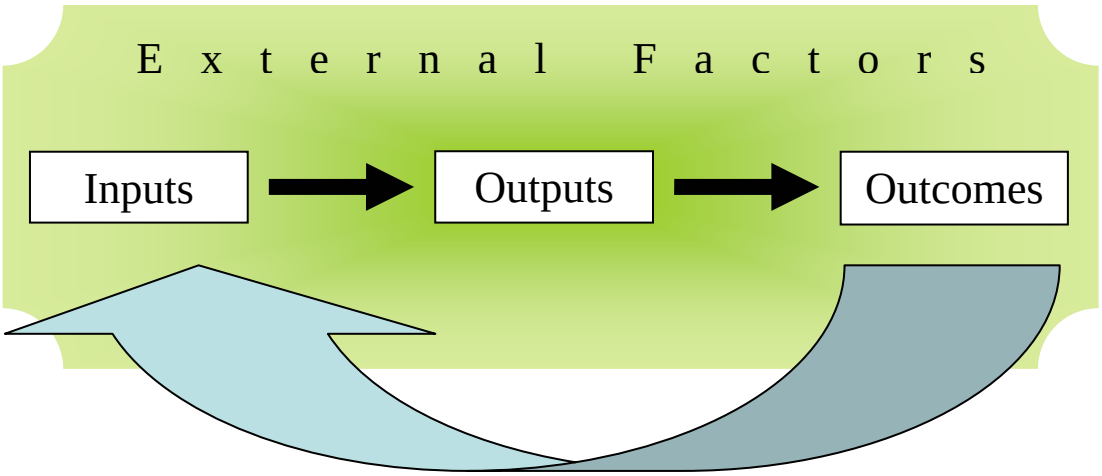


Figure 1-1: Conceptual model of how inputs, outputs, and outcomes of transit relate.

Second, planning and decision-making inputs result in specific services and strategies, each having characteristics that are unique to a given situation. These outputs of the initial planning and decision making influence the response of the traveling public to new transit services and lead to impacts on economic development. This part of the conceptual framework yields several questions. What types of services and strategies have parks and gateway communities implemented to achieve their stated goals and objectives? What characteristics of these services and strategies affected the eventual traveler response? What can past experience offer to improve future strategy definition and implementation?

Third, the eventual outcomes of implemented strategies and services are the important results of targeted policies. These outcomes are influenced by factors often outside the control of those implementing the policies, but nonetheless represent the ultimate result of the initiative undertaken by transit service organizers. Important questions for this research include, what was the impact on transit ridership of the new services provided?

What was the overall impact on economic development, public image, employment, and business competition in and around the national parks?

Fourth, external factors influence every part of the process and become apparent in the eventual outcomes relating to implemented strategies and services. For example, changes in funding sources can positively or negatively affect the level of resources available to support transit and the size of transit service contracts used as inputs to the process. General employment availability and average wages in local regions will affect the output of how effectively transit operations can run. In terms of performance outcomes, a general economic downturn can reduce overall visitation to national parks just when new transit services start, or the National Park Service could launch a national marketing campaign that results in increased visitation leading to a proportional increase in the number of riders on new transit services. For this research, what factors influenced newly implemented transit services? How, if at all, can these factors be monitored to isolate the effect of transit on such things as road congestion and economic development?

For the research questions relating to past performance of transit systems, this conceptual framework structured the synthesis of research results to isolate and identify the components of transit systems and transit system performance according to goals. The conceptual framework further established the organizational structure for the guidance and recommendations to address the research question about how to approach and monitor transit performance according to locally established goals.

1.4. Relevance of this Research

Several gateway community leaders have suggested that transit in national parks will have significant regional economic implications, and some local leaders have initiated

contact with park officials to make sure they have a voice in planning the services that will affect them (*4*). The National Park Service has responded by devoting time and resources to analyzing local situations, involving the public, and creating local rather than national strategies. This research thus fits into a broader policy environment of collaborative transportation planning established with memoranda of understanding between the National Park Service and the U.S. Department of Transportation (1997) and the National Association of Regional Councils (2003).

Examining the effects of transit in parks, whether from a recent introduction of transit or from major changes to existing service, offers insights on what recreational communities can expect from transit systems. Such an examination helps identify best practices, which manifests in recommendations for implementing these practices in other situations. These best-practice recommendations can apply to many resort, recreational, and rural communities. The results of this research will interest the parks and communities studied, other parks and communities considering or implementing transit, and national strategists in the National Park Service, as it continues to develop alternative transportation strategies service-wide. This work can also establish models for other federal land agencies (e.g. the U.S. Forest Service and the U.S. Fish and Wildlife Service), state recreational land managers, and local resort communities with private recreational opportunities, such as ski resorts and beach communities. Many of these areas are located in remote locations where transit service has never been tried, so information on the experiences of similar communities that have gone through the process of implementing transit will help communities prepare for the changes associated

with new transportation patterns in places where traditions, such as private vehicle driving, typically run deep.

1.5. Organization of the Dissertation

This first chapter has described the need and methodology for the research. It has established the motivation for the research and identified the two primary types of research questions being addressed. The conceptual framework established here will give structure in future chapters to findings and recommendations.

Chapter two establishes the study structure. It begins with a discussion of the history and context of transit in national parks and proceeds with a review of academic literature that shows the methods used to analyze the impacts of public investment in parks and transportation initiatives. From this literature emerges an identification of appropriate methods for approaching the question of impacts of transit in national parks and gateway communities.

The structure of case studies appears in chapter three. This chapter explains the criteria used to determine the selection of case studies, and it depicts the tiered procedure of eliminating candidate sites to identify seven case studies. Finally, the chapter elaborates on the data collection and analysis procedures used in the case study methodology.

Chapter four synthesizes the results of the case studies to identify broadly applicable findings. These results depict the characters of parks and their associated gateway communities, followed by a description of transit systems, the goals for transit, and recent changes to the systems. The analysis includes the identification of quantitative trends and qualitative observations of the impacts of transit.

Chapter five provides guidance and recommendations for parks and gateway communities to set and achieve goals on how they want transit to affect their local areas. This chapter discusses best practices found in the case study parks and recommends data collection procedures for benchmarking and monitoring performance against service goals. Recommendations for future areas of research also appear here.

Chapter six summarizes the contributions of this research and offers conclusions on the state of the practice for transit in recreational areas and its impacts on local areas.

(*4*) Shea, Patrick. "Shuttle Service in National Parks: Reducing Congestion and Improving the Tourist Experience," *Guidebook for Change and Innovation at Rural and Small Urban Transit Systems*, Transit Cooperative Research Program (TCRP) Report 70, Transportation Research Board, National Academy Press, 2001.

2.0 CONTEXT AND LITERATURE REVIEW

2.1. Introduction

Transportation has challenged national park management since before the founding of the National Park Service. The isolated and topographically intricate nature of many of the nation's rural parks posed problems for road engineers in the nineteenth and early twentieth centuries (*5*). Once road engineers established private vehicle access and Americans took to private vehicle travel in the middle of the twentieth century, automobile congestion quickly grew into a dilemma for America's most pristine places (Figure 2-1). At peak times of the year, safety, traffic congestion, and air quality problems associated with high volumes of automobile traffic now plague some parks equally as much as America's metropolitan areas. This chapter discusses policy context for interest in national park transit and also reviews literature related to analyzing how National Park Service actions, such as introducing transit, affect gateway communities.



Blue Ridge Parkway in the 1960s Grand Canyon National Park in 1995

Figure 2-1: National Park Service archives show a history of congestion.

2.2. Policy Context

Increasing road congestion in national parks led to growing interest in the 1970s to find alternative means of providing access to and circulation in some of the most congested parks. The *Federal-Aid Highway Act of 1973 (§ 134b)* called for a "full and complete investigation and study to examine problems of user access to parks, recreation areas, historic sites and wildlife refuges." The resulting study released in 1975 discussed needed resources, users, and institutional/legislative issues. The study found that roads in gateway communities approaching parks often carried traffic in excess of their design capacities. Typical traffic patterns at the targeted recreational facilities peaked inbound in the morning and outbound in the late afternoon. Internal park circulation systems frequently could not handle peak demand, whether the recreation areas were within metropolitan areas, on the fringe, or located in non-urbanized regions of the country. Traffic congestion created unsafe conditions with unplanned and haphazard right-of-way sharing between motorized and non-motorized modes; parking and auto storage requirements did not satisfy demand.

Most recreation areas depended on motor vehicle access, so road and automobile capacity dictated how many visitors could access resources. Private vehicles comprised 90 to 95% of all person-trips to significant recreation areas. Encroaching private development in gateway communities often added to congestion problems. In urban areas, mass transit often served local recreation areas, but transit services in urban areas primarily reflected commute patterns, so recreation areas were receiving poor service. Typical urban mass transit systems reduced service on weekends, which were peak times for recreational travel. Visitors who did arrive by transit experienced limited mobility

because internal circulation systems depended on private vehicles. The most significant barriers to public transportation use were found to be scheduling, frequency of service, proximity of transportation stops to homes and destinations, and travel time. People dependent on transit, particularly the disabled and the aged, showed reduced levels of recreational activity as compared to people with access to motor vehicles. In general, the study found that transportation planning at all levels of government failed to consider access to recreation areas, deeming recreational travel a lesser consideration to commute trips (*6*).

In 1975, the National Park Service funded a Pennsylvania State University study of traffic flow at Cades Cove in the Great Smoky Mountains National Park to determine the viability of transit. A simulation of travel patterns at this site predicted the proposed mass transit system would not attract many riders and indicated that the National Park Service should not implement such a service. The study recommended expansion of parking facilities at several locations and the consideration of other alternatives, such as limiting visitor use of a loop road according to morning observations or controlling the number of loop road users over a given period of time (*7*).

Despite the results of the Cade's Cove study, interest in the potential of transit access to national parks has continued. *Title III of Public Law 95-344 for Public Transportation Programs (Act of August 15, 1978; 92 Stat. 477; 16 U.S.C. 2301 through 2306)* found that private vehicle-dependent access to parks might diminish the natural and recreational value of the National Park System. The Act encouraged the National Park Service to examine the use of alternative transportation modes having minimum disruption to

neighboring communities, and it authorized a pilot transportation program. Congress allocated $6 million between 1979 and 1981 for service.

In the last two decades, visitation in national parks has grown by over a third (Figure 2-2). Increasing visitation has exacerbated congested conditions, increased stress on natural resources from the high levels of human activity, and refocused attention on air quality concerns from mobile source emissions. These increasing levels of visitation once again resulted in policy interest in further assessing transit's potential role in alleviating park congestion problems.

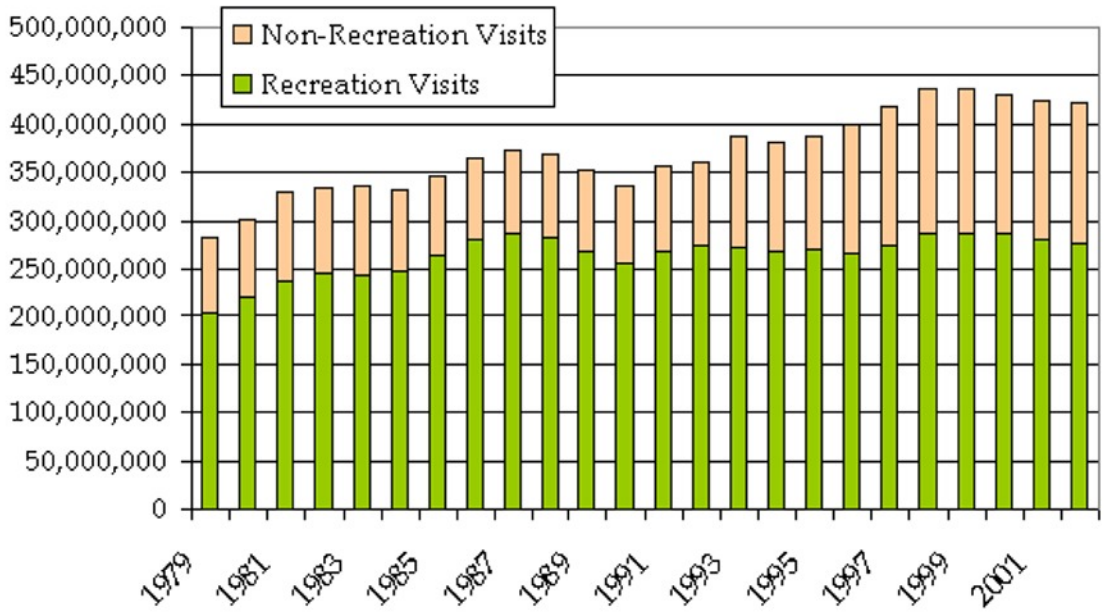


Figure 2-2: System-wide Visitation Trends, 1979-2002 (National Park Service Public Use Statistics Office)

Section 1050 of the Intermodal Surface Transportation Efficiency Act of 1991 (Public law 102-240) requested a study of transportation alternatives for the national park system. In response, the National Park Service commissioned such a study in 1994. The study found potential for expanding the role of transit in parks based on the successful use of 25 then existing transit systems in twelve parks. The study also found a need for increased coordination between parks and gateway communities in order to address transportation problems (*8*).

Interest in addressing park transportation needs continued throughout the 1990s. A 1996 presidential memorandum required the secretaries of the Departments of Transportation and of the Interior (the home department for the National Park Service) to develop a plan to improve ground transportation in national parks. The agencies responded with a 1997 memorandum of understanding between the departments, recognizing the mission and responsibilities of each agency and establishing a planning and development goal for intermodal cost-efficient transportation systems serving national parks. This memorandum has resulted in technical assistance to parks to develop multimodal systems, operational testing of intelligent transportation systems in parks, and the development of the Alternative Transportation Guidebook (*9*) for the National Park Service (*10*).

Parks benefit from implementing visitor transportation systems in several ways. Reducing traffic, associated vehicle emissions, noise, and disruption of wildlife and roadside habitat helps better protect natural resources. Limiting access and controlling visitor volumes also reduces secondary and cumulative effects. Locating transit stations

in gateway communities also allows visitors to learn about parks and interpretation of park features and history in advance of arrival at the entry gate (*11*).

Given that transportation issues and visitor needs involve the areas surrounding parks, as well as the parks themselves, successful transit service often depends on its connection to surrounding gateway communities. A 2003 memorandum of understanding with the National Association of Regional Councils (NARC) commits the National Park Service to working collaboratively with local communities to develop new understandings and best practices in community planning. The National Park Service realized that as it responded to traffic challenges with new bus systems in the nation's parks, local communities near parks needed information to help them understand and prepare for changes in the way people visit.

The most recent examination of planning for park access, an investigation by the General Accounting Office (GAO), critically evaluated the economic basis of planning processes (*12*). This criticism suggests the need for technically sound research into park transportation planning. Park planners and gateway communities need a means of understanding the economic and mobility impacts of park transportation service.

In sum, the past two decades have brought greater policy interest in transportation planning for national parks. This interest has evolved from one simply focused on providing uncongested road access to a much broader emphasis on the economic and mobility impacts of such transportation on gateway communities. A similar evolution is found in the literature that has examined national park transportation.

2.3. Methodologies for Assessing Impacts

This literature review examines the methods that can be used to assess the economic impacts of new transit service in national parks. This section sets the stage for the mixed qualitative and quantitative analysis necessary to understand the economic impact of transit systems in parks and gateway communities. Approaches to determining economic impacts emerge out of past studies and existing research literature on the economic importance of national parks and supporting transportation systems, and limitations on data availability set the stage for the types of analyses possible in different situations. This discussion leads to a recommendation for the type of methodology needed to answer questions about the role of transit service in parks and its gateway community impact.

2.3.1. Economic Impacts of National Parks on Gateway Communities

Several studies have examined the economic impacts of national parks on gateway communities. A 1954 study, which was one of the first examinations of the subject, estimated that visitors to Rocky Mountain National Park spent an average of 22 days and $380 per party on their vacations to the park… twelve percent of their annual income (*13*). The First World Conference on National Parks in 1962 examined the economic impacts of parks. In one of the presentations at this conference, the director of the California Department of Parks and Recreation cited park-related economic benefits as evidenced by trends of increasing numbers of visitors, the direct daily expenditures per park visitor, the turnover of each dollar spent again within a tourist community, tax revenue from tourists, net changes in the number of businesses in tourist areas, wages and salaries to permanent and seasonal staff, and increasing land values for property surrounding parks. These benefits were considered to outweigh the revenue loss that

occurred when park lands disappeared from local tax rolls (*14*). A 1995 study by the same state agency showed continued tourism revenue gains for the state--the 66 million annual visitors to the state's parks were estimated to spend $1.6 billion, generating a total of $4 billion in new sales when the economic multiplier effect was considered, $2 billion in total income, and financial support for 62,000 full-time-equivalent jobs (*15*).

Other economic studies have yielded the following findings:

- A 1972 study of the North Cascades Highway in Washington concluded that since the opening of the highway, communities along the highway closest to the park experienced high economic growth rates, while communities farther from park access, which saw a smaller share of visitor expenditures, were forced to develop their own recreation attractions to obtain recreation income. The report recommended clustering commercial recreation facilities to minimize environmental impact, to provide convenience to recreational users, and to assure the economic well-being of established businesses (*16*).
- The University of Utah's Bureau of Economic and Business Research conducted a study in 1975 in response to concerns over the potential economic impact on the southern Utah economy if Zion National Park closed its overnight cabin accommodations. Using existing data from the National Park Service, concessioners, and surrounding businesses, researchers predicted a relatively small impact on local employment and income, as well as on the number of visitors to the park, their length of stay, and their total expenditures (*17*).

- The National Park Service and the Pennsylvania State University conducted a 1992 examination of the impacts of rail-trails. This study comprised a mail survey of trail users, a mail survey of landowners adjacent to the trail, and telephone interviews with real estate professionals in the communities. The research showed that local residents made up most of the trail users and that the effects of the trail on their property values were unclear. Restaurant and auto-related expenditures were the largest categories of trip-related expenditures (*18*).
- A 1995 Blue Ridge Parkway study estimated that the communities along the 470-mile (756-km) parkway received an annual $1 billion in economic return (*19*).
- A study of Yellowstone National Park estimated park visitors produced more than $725 million in expenditures, creating 16,163 jobs (*20*).
- The Department of the Interior estimated that the 1995-1996 government shutdowns brought the daily loss of $14.2 million in tourism revenues for gateway communities surrounding national parks and a daily loss of $104,000 in entrance fee revenues that would have gone to the U.S. Treasury (*21*).
- A study in 2002 by the University of Montana found above average growth over the last 30 years in population, jobs, and aggregate real income for between 85 to 90 percent of the 45 counties surrounding the 21 largest rural parks in the continental United States (*22*).

Several countries have also found that revenue from international tourism makes national park visitation one of their country's top five exports (*23*); however, in some cases, because of the local economic nature of the park land to indigenous peoples, the impacts of parks are not all positive. For example, in the more rural setting around Lake Mburo National Park in Uganda, the local economy has not developed around tourism. A 1994 study showed that the rural communities of animal keepers and farmers suffered financial losses as protected wildlife in the parks crossed park boundaries to take advantage of crops and livestock on private land. Despite such problems, only one quarter of surveyed local participants disliked the park designation (*24*).

While the majority of studies have demonstrated positive economic impacts on local communities, government actions surrounding national parks continue to make local communities nervous. For example, amid the discussion in 1975 on creating the Kenai Fjords National Park in Alaska, the City of Seward's city council passed a resolution condemning the idea. Seward had struggled economically ever since the Good Friday Earthquake in 1962, and citizens saw the park designation as a restriction against future economic development of the area. As it turned out, a 2001 study showed the annual average employment rate in Seward grew 3.7 percent each year since the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) created the park. Other industries suffered through the subsequent decades for various reasons, but the visitor industry has successfully driven economic growth in the region. In 1985, the city council rescinded its condemnation of the park designation (*25*).

Several other types of economic impacts from national parks have not received as much attention as has the estimated direct economic (i.e., income) effect. For example,

the tourism industry traditionally generates low-paying service jobs, and these employment opportunities usually disappear in the off-season. Wealthy seasonal residents often displace long-time permanent residents who can no longer afford to live in the communities. Furthermore, if tourism communities do not develop or maintain diverse economies, the economic strength and consequent quality of life of a community's residents will depend entirely on the vagaries of tourism cycles. Undiversified tourism economies suffer more from downturn situations like the Norwalk virus and its impact on cruise destination visitation and the reduction in travel that followed the anxiety generated by the terrorist attacks of September 11th, 2001. Finally, the necessary local investment in infrastructure and services can be out of scale with the size of a community's permanent population. Small towns might host several million visitors during the tourist season, necessitating metropolitan-scale parking lots, law enforcement, and transportation, among other public provisions that are unnecessary in the off-season (*26*).

Events in Yosemite National Park underscored the need for understanding the interrelationship between mobility in parks and the economic vitality of gateway communities. Park officials had created a Restricted Access Plan for closing entrance gates when the number of vehicles entering Yosemite Valley exceeded the available supply of roughly 1,200 parking spaces. In the mid-1990s, peak summer visitation exceeded the trigger point, and the park's gates were closed. With travelers waiting for hours to enter the park and press coverage saying the park had closed, people stopped going to the park. Visitation declined, and local businesses dependent on the crowds of the summer tourist season suffered (*27*). Nearly a decade later, visitors still call local

businesses to ask if they will have access to the park, even though visitation has never reached the same peak levels in subsequent years.

2.3.2. Analysis Tools

A thorough evaluation of the impact of national parks on surrounding communities should consider many different aspects of community development, such as income for area residents, job choices, activity choices (options for shopping, dining, and entertainment), stability of jobs and income, and amenities. Approaches to analyzing such impacts come in two primary forms: *predictive analysis* to forecast what will happen when a change is introduced into a community and *evaluative analysis* to determine what effects have taken place after a change has occurred. Traditional methods used to determine economic impacts of new transit service usually monitor indicators that are generative (user benefits, employment, income, cost savings through agglomeration, externalities, and accessibility), redistributive (land development around transit stations, employment and income growth near transit, and increased economic activity along a corridor), or financial (transit-related employment, joint development income for agencies, and property taxes). The appropriate method for a given situation depends on the purpose of the analysis, the questions that are posed, data availability, and the balance of cost versus available resources for the study (*28*).

It is important to note that not all of the tools used to conduct economic impact analyses can be applied effectively at all scales of analysis. Input-output models, for example, tend to be applied for counties or larger geographic regions; however, a smaller community might experience changes in economic activity that for them is important, but which would hardly register at a state or county level of analysis. The choice of

vacationers to go to one park as opposed to another because of local transportation options might be impossible to detect at the national or even state level, while the communities surrounding the two parks in question would face either a windfall or an economic downturn according to which park accessibility options visitors preferred (*29*).

The following sections provide a brief overview of the types of analysis tools that have been used to determine economic impacts of public land projects.

2.3.2.1. Input-output Models

Input-output models are some of the most popular tools for predicting economic impacts in tourism and other economic sectors. The National Park Service, the U.S. Forest Service, and other public land agencies have used input-output models for many years and have produced reports on the use (*30*) and misuse (*31*) of such models.

These models are based on the core concept of economic multipliers. When a local restaurant receives a dollar of revenue, it is spent in different ways to sustain operations. Some portion of each dollar spent at the restaurant will go outside the local area (perhaps to food suppliers), but the restaurant will spend some fraction of that dollar on local goods and services, for example, the cost of locally baked goods, bills for the local electric company, and so forth. These businesses receiving portions of this dollar will in turn re-spend a portion of their share again locally. These indirect expenditures in the local community multiply the value of the original dollar. Thus, the local value of the dollar directly spent at the restaurant is worth more than one dollar when the multiple expenditures in the community factor into the analysis. Economic impact studies further consider the induced spending that occurs when that restaurant's employees spend their paychecks on consumer goods available locally.

To study economic impacts, analysts consider the way indirect and induced spending in various industries multiplies the local value of a dollar directly spent in the community. They calculate what fraction of a dollar earned in one industry will be spent locally in another industry and then construct tables of these multipliers according to Standard Industrial Classification (SIC) or North American Industrial Classification System (NAICS) codes. The model iterates several times to determine how much money remains locally when the model reaches equilibrium.

Finding the right multipliers for an economic analysis creates a formidable challenge. Meaningful results rely on accurate and detailed input data, and those data rarely exist at the scale of gateway communities. Even though the U.S. Department of Commerce maintains national multiplier tables for national economic evaluations, and pre-existing input-output software often supplies average data, the economic market structure of local communities typically differs from national averages. Especially when analyzing a small community, the indirect sales multipliers can vary greatly from national, state, and even county averages. Analysts must therefore calibrate multiplier tables (a costly and time-consuming process) according to county, regional, or state economies. Counties are typically the smallest geographic areas analyzed because, to protect business confidentiality, information on businesses at a less aggregate level is not available publicly.

Economic impact studies of tourism-dependent communities, in particular, require data on how much money tourists spend in each sector of the economy, preferably broken down by demographic characteristics of tourists; however, visitor use surveys that provide such data are typically taken irregularly and rarely. Even with up-to-date

information, visitor surveys can provide skewed information because sampling locations and times for a seasonal tourism location might misrepresent year-round use (*32*). Local and regional resident consumer expenditure surveys almost never exist in tourism communities (*33*).

Despite these limitations, input-output models can provide important predictions of economic impacts. The federal government has been a major user and developer of such models to estimate the economic impacts of a variety of government programs. In particular, federal agencies have developed input-output models to examine the economic relationships between state and local community economies and federal investment in public lands. In some cases, third parties have refined these models and made software available to the public. Examples of federally developed models used for economic analysis of tourism communities include:

IMPLAN -- The U.S. Forest Service developed the IMPLAN (IMpact analysis for PLANning) input-output model in 1983 to evaluate impacts of forest management plans. Using secondary databases from the Census Survey of Current Businesses and the U.S. Department of Commerce's Bureau of Economic Analysis, this model created a non-survey alternative to otherwise expensive and time-consuming input-output modeling (*34*). Databases commercially available for this model include economic multipliers for U.S. states and counties with some data available at the zip-code level (*35*).

The National Park Service has used IMPLAN to conduct economic impact analyses, as well. For example, a regional study of the Blue Ridge Parkway estimated visitor spending, tax revenues, and jobs in adjacent counties using this model (*19*). Similarly, the Department of Parks, Recreation and Tourism Management at the North Carolina

State University employed IMPLAN in an analysis of the economic impacts of long-distance trails, estimating $14.1 million in total value added to the 15 counties around the Overmountain Victory National Historic Trail in 1995 (*36*). A recent study on the economic impact of restoring the Glorieta National Battlefield in New Mexico faced the problem of predicting what would happen to visitation for an area where visitors had no pre-existing access. With no baseline visitation numbers, the study used other Civil War battlefields with similar characteristics and performed a statistical regression on their visitation to forecast visitation at Glorieta. The results of visitor use surveys at other national monuments in New Mexico were also applied. The estimated tourism revenue was then input into the IMPLAN model to forecast the effect of these direct expenditures on the economies of two counties (*37*). Finally, a study of alternative transportation systems for park communities used a regional IMPLAN input-output model for several gateway communities to predict economic impacts. In these case studies, the model predicted capacity increases in the number of people who could access parks, as well as transit system costs (capital and operating) and job creation (*38*).

Money Generation Model -- The Money Generation Model developed by the National Park Service in 1990 (*39*) and MGM2 developed at Michigan State University in 2000 (*40*) estimate the multiplier effect from monetary influxes into regional economies. By considering purchases of goods and services, sales and income tax revenue, and jobs in an area, the model calculates the ultimate economic impact from park tourism expenditures, National Park Service employee salaries, construction projects, and other park-related activities. The model can also predict impacts from community investment in new businesses and public infrastructure. MGM2 refines the input and output approach

by considering cross-sections of visitors and by disaggregating spending into twelve categories. This model bases its regional multipliers on IMPLAN databases, although it is recommended that visitor surveys be used to refine the multipliers.

The Money Generation Model has been used in several studies. In the National Park Conservation Association's analysis of the economic impact of the 1995-1996 government shutdown on regions around national parks, the Money Generation Model estimated the loss in out-of-state visitor spending in Utah and then applied sales and employment multipliers from the U.S. Commerce Department's Bureau of Economic Analysis. The model's results served as a basis of comparison to business surveys (*41*).

An application of the Money Generation Model at Harpers Ferry in West Virginia examined visitor expenditures and government operations spending for the Harpers Ferry National Historical Park, the Stephen Mather Employee Development Center, the Harpers Ferry Center, and the Appalachian Trail Project Office. This study differed from most park impact studies in that many of these facilities were geared more toward internal operations of the National Park Service, rather than visitor services. Park visitors accounted for 25 percent of direct expenditures, compared with 21 percent attributed to the park budget and 55 percent attributable to budgets for the training center, service center, and project office (*42*)

International Tourism-oriented Models -- Input-output models have also been used internationally in estimating the economic impacts of recreational areas. In Canada, the Demand Economic Impact Model (DEIM) was developed for the Alberta Department of Economic Development and Tourism. This input-output model was used to estimate the economic impact of visitors to Banff National Park (*43*) and Jasper National Park (*44*).

The DEIM estimates local, regional, and provincial impacts on expenditures and employment for a specific time period or event.

European researchers have developed the Generated Regional Input-Output Tables (GRIT) technique to develop localized national input-output tables for tourism-dependent mountain communities. This technique considers the amount and distribution of tourist spending, household expenditures in the local economy on different goods and services, the allocation of business turnover in terms of linkages within the local economy (local purchases and income to business owners and employees) and leakages to the external economy (taxation and imports). The incorporation of business turnover and household expenditure makes this methodology particularly appropriate where the local economy does not depend entirely on tourism (*45*).

2.3.2.2. Regression and Econometric Models

Regression and econometric models infer causal relationships between statistically significant variables and can be used to estimate what will happen to one variable as a result of changes in one or more other variables. In economic forecasting studies, employment, land values, or tourism revenues might be predicted on the basis of transit investment and transit service levels. Hedonic price modeling uses regression analysis to relate property values to attributes of the property, such as accessibility to transit in the local area. Logistic regression analysis provides a mathematical means for modeling discrete categories such as type of lodging (bed and breakfast, motel, campground, and so forth) as opposed to continuous variables such as distance from a park (a numerical value of mileage). Regression and econometric models can both predict future effects or evaluate current conditions (*28*).

2.3.2.3.Surveys

Surveys can be used for either prediction or evaluation. Stated preference surveys can test the popularity of new concepts, whereas revealed preference surveys show how people really react in situations (*46*). The validity of the survey results directly relates to how well the sample represents the full population (*47*). The demographic makeup of visitors changes through any given season and from season to season. The research design for surveys needs to take this variation into account.

Surveys provide the base data needed for many of the quantitative evaluation techniques available. Input-output models need visitor use survey results to determine visitor spending to calibrate multipliers.

2.3.2.4.Expert Interviews

Expert interviews garner information from a local perspective for predictive studies or from local memory for evaluative studies. Interviews typically target government officials and business leaders. Taken together, a series of interviews in a community can show consensus or dominant public impressions (*29*).

In practice, expert interviews can bring to light relevant information and issues that might go unnoticed in other forms of study. The authors of the overnight cabin study for Zion National Park raised several questions that would not have appeared in a strictly numerical analysis (*17*):

- What changes will Park officials make in the variety, quality, and quantity of recreational opportunities?
- What changes will Park actions cause in the volume and seasonality of local employment?

- What increases in public costs can be expected as a result of increased recreation activity?
- What relative shifts will Park actions cause in the property tax base?
- Will land use patterns significantly change in the area surrounding the park?

Such questions can raise issues that might be unforeseen. Major changes in structures and operations will cause other stakeholders to change their own structures and operations. These changes might take several years, or they might occur immediately, but business and resident responses to changes in park transportation could create a significant impact on the local economy in addition to foreseen direct impacts. Local reaction to proposed actions can best be identified through expert interviews because traditional measures and pre-programmed survey questions might not capture the thought processes of local stakeholders.

2.3.2.5. Demographic and Real Estate Trends Assessment

Over time, people make location decisions based on a variety of factors. For example, demographic and real estate patterns could change after the introduction of a well-utilized public transit system if such service provided a perceived utility to people using it. Examining patterns in the U.S. Census and real estate data sources, such as the Multiple Listing Service, could give insights on long-term impacts. As transit service provides auto-free mobility, will more retirees and young students seek employment in gateway communities? Will the demographic makeup of permanent residents change? Will the communities grow? Demographic impact assessment (*48*) and real estate market analysis (*28*) can monitor redistributive effects of people, land values, and land uses to

assist in planning for communities, although isolating the impacts of transit over a range of time is difficult.

2.3.2.6. Analysis Tools in Summary

This review of analysis tools for evaluating the economic impact of parks on surrounding communities shows that the appropriate choice of a tool for a programmed study will depend on several factors.

First, the availability of economic or other data that can be used in the analysis is a critical determinant in the effectiveness of the different tools. If data are unavailable or defined at too aggregate a level to be sensitive to changes in local conditions, tools that depend on such data will not be very helpful for local analysis.

Second, study designers need to determine whether they need specific or comprehensive information. Pre-packaged models can efficiently answer the specific question of changes in state tax revenue based on construction of a new lodge, but if researchers want to understand the different types of community and business responses to park projects, the range of results will most likely be too broad to be reflected in traditional databases.

Finally, the intended use of study results indicates the type of analysis to conduct. If communities want to set expectations for the economic performance of different project alternatives for a particular park, predictive models are appropriate. If the question relates to sharing information on the impacts experienced in places where an event or project has occurred, or if a particular park and community want to examine their experience to inform future planning, researchers should employ evaluative techniques.

2.3.3. Approaches to Monitoring the Impacts of Park Transit

What happens when transit service, having its own economic impact potential, is introduced into a national park, which has its own economic development impact? Does the combination result in an enhanced economic benefit, or does the combination dampen the effects of either influence?

Gateway communities have mixed ideas on these questions. Some businesses fear that transit systems will lead to bans on private vehicle use on park roads. These business owners predict that people will choose to visit locations where the private vehicle can be used to see the sights, thus parks that limit motor vehicle use could see reduced visitation with corresponding reductions in economic activity in gateway communities. In contrast, other people see transit service as a means of seeing the sights instead of watching the road, and some businesses endorse private vehicle restrictions.

Employers think about other issues, as well. With the introduction of the Island Explorer shuttle at Acadia National Park, local business owners saw the shuttle as a way to address heavy traffic and its associated air pollution. They also saw the shuttle as a way for customers to enjoy a better visitor experience if they did not spend their vacations looking for parking (*49*). Park managers at Everglades National Park and Shenandoah National Park suspect that transit could provide a solution for attracting and retaining employees where lengthy commutes to remote locations diminish the appeal of part-time or low-paying jobs (*38*).

A study of transit on federal lands has identified three basic forces acting on the economies of gateway communities: capital investment in equipment and facilities, ongoing transportation system operations, and changes in site visitation and associated

visitor spending. These forces act differently at the national and the local levels. Nationally, money goes into capital investment in infrastructure and rolling stock, support for project development, materials, and services; employment appears as both a cost to the government and a benefit to the populace, and that employment results in the induced effect of workers spending their wages. Viewed from a national perspective, changes in visitor spending patterns would probably only redistribute money without changing the aggregate total. The local perspective differs substantially. Changes in spending patterns from one community to another or from one industry in a community to another could have substantive effects on local economic structure. Because bus manufacturers rarely locate in gateway communities, purchases of rolling stock for transit operations typically would not inject money into local economies, but employment for infrastructure construction, transit operations, and maintenance workers could be substantial relative to the size of the local economy. The indirect effects of businesses buying from other local businesses would likely be small because again, gateway communities typically have few suppliers of bus equipment and construction materials. Induced effects from employee spending, however, could support local providers of food, clothing, and consumer items (*38*).

Estimating the economic impacts of park transit service raises the difference between regional economics, where all points in the region are considered equal, and urban economics, where distance and time from a point matter. The field of urban economics concentrates on the location choices of firms and households. People choose locations based on access to the resources they need in their businesses and their lives (*50*), and thus in gateway communities, businesses (and visitors) choose locations based on access

to parks. Park transportation analysts can use techniques for regional economies to evaluate transportation changes that affect all businesses in a county roughly equally, such as adding an additional road inside park boundaries or altering snow plowing schedules to open access across a mountain park earlier or later in the season. In contrast, the concentrated geographical coverage typical of transit systems joining parks and gateway communities requires a location-sensitive approach. The introduction of transit in a community alters the geography of park access, such that the properties served have easier access to other destinations on the transit line. Businesses in park-dependent gateway communities emerge based on access to the national park; therefore, businesses with greater access via transit gain a location advantage. The small transit systems in national parks and gateway communities serve such limited areas within their counties that measures of county performance cannot capture the redistributive effects of change of access for businesses in and around gateway communities. In this sense, the location-driven field of urban economics applies to the unique situation of gateway communities more than the field of regional economics, even in small gateway communities where the term “urban” seems otherwise unfitting. Given the nature of transit services, the design of the routes themselves becomes an important consideration in assessing the potential economic impact on a community. Designing routes to serve key sites in a community could be a critical factor in how the service interacts with businesses in the local economy. With this difference between regional and local studies, different analysis tools can apply to gateway communities in different ways.

Given that input-output analysis must use aggregate data for counties or larger geographic regions, they cannot capture the local dynamics in gateway communities,

which are sometimes small towns with populations of a few hundred. Analysts must carefully define the scope of the study, the alternatives considered, and what questions the study must answer. Readers of these studies must understand that the analysis cannot address the problem with complete accuracy and full comprehensiveness, and these models produce a theoretical estimation, rather than the results of practical measurement or tabulation. Tradeoffs in cost and time must always occur (*51*). As a predictive tool, input-output analysis can give a broad-strokes quantitative indication of the larger effects on a region to inform choices between several alternatives.

To determine the economic impacts of transit in parks, the National Park Service needs a finer-grain procedure than input-output modeling. The procedure should focus first on understanding the direct effects of money spent by tourists in local communities. Multipliers for indirect and induced spending in such small communities would require a high degree of calibration for each community, making the analysis cost-prohibitive in most cases. Even with sufficient funds to perform such a study, the analysis could not provide confidentiality for businesses through aggregation.

Although commonly used in urban transportation and economic development planning, regression and econometric models have limited application in the context of gateway communities. Analysts typically use these methods to develop industrial models for whole cities, counties, or larger geographic areas. The local area on the outskirts of a park with direct impacts from the park transit is typically so small that only a handful of businesses exist in a given industry. These modeling techniques can provide good guidance on any scale as long as data inputs come from a sufficient sample, but inputs such as sales volume projections are difficult to obtain because data are not available at

such a small scale. Survey techniques must provide the data before these more advanced models can be employed.

For analyzing transit in recreational areas, several survey types can provide insights on economic conditions and trends:

Visitor use surveys target a sample of visitors with questions such as how much money they spend on lodging and food, as well as what mode of transportation they use. Unique to tourism areas, this tool more than any other gets to the core issues associated with the visitors, who are the primary contributors to the economy and the primary intended riders of transit. These data form the basis for the multipliers for tailored input-output models or for the independent variables of regression models. Visitor use surveys form a vital component of any economic impact assessment of land management actions. The U.S. Census Bureau has worked with the U.S. Fish and Wildlife Service to conduct the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation roughly every five years since 1955. This survey allows trend analysis of spending patterns of people, according to wildlife interests (e.g. hunting, fishing, or observation), as well as visitor demographics (*52*). The National Park Service has taken increased interest in visitor use surveys in the last few years. Using the same standardized short forms for all parks, it has initiated a national visitor survey program to meet performance management requirements under the Government Performance and Results Act of 1993 (*53*); however, the standardized design does not directly address questions of park transit. The established history of surveys for visitors of recreational lands can easily include questions specific to transit to allow targeted analysis of transit user spending patterns and other relevant economic factors. Already, a study at Acadia National Park has

conducted a survey found that visitors who used the shuttle and intelligent transportation systems stayed in the area longer than other visitors. Over half of the people who used the transportation amenities stayed five or more days, whereas 56.5 percent of other visitors stayed on the island four days or fewer. These types of results help identify the economic impacts specific to transit users (*54*).

Because ridership surveys obtain the opinions of those people who use transit services, they should be a subset of visitor surveys. Such surveys can show differences in spending and visitation patterns between people who use transit and people who choose other forms of transportation.

Business surveys, though they cannot generate data on revenue with any degree of confidentiality, can show how many patrons of a given business type use the transit system and can indicate general trends in the local economy. Business surveys are useful when base year data (before the start of transit service) do not exist. Business owners can recall and discuss their opinions of what trends they have perceived, but given a choice of surveying visitors or surveying businesses, surveying visitors is preferred. The sample size of visitors will be large enough to assure anonymity through aggregated results, whereas only a small number of businesses might receive direct service to realize the effects of transit in gateway communities. For questions of visitor behavior and spending, visitor use surveys are more direct than business surveys, in which results filter through a business owner's perspective. Business surveys are more useful if researchers want to learn business-specific information, such as the strategies used to attract the transit-riding public or observations in local experience. For example, a business survey conducted for gateway community businesses near Acadia National Park found that

lodging business parking lots, which in previous seasons emptied in the morning, retained cars through the day during the shuttle season, but as soon as the shuttle closed for the season, the lots emptied for the day again because the visitors needed to use their private vehicles to circulate on the island (*55*).

Resident surveys are not typically conducted, though they could offer a perspective on local behavior. Visitor use surveys can be used to capture this perspective, as well, by providing a question about the location of respondents' homes. Local residents of gateway communities typically make up a subset of visitors.

Surveys specific to park transit experience are already starting to appear. For example, most park transit operators take annual ridership surveys to monitor performance. In another example, the University of Maine at Orono Parks Recreation and Tourism Program is using surveys of visitors and businesses to investigate the economic experience with transit in Bar Harbor, Maine (population 2,659 in the 2000 U.S. Census) outside Acadia National Park.

Although a variety of tools can be used to assess the impacts of park transit services on local communities, qualitative research techniques offer the best means of considering all facets in an evaluation, particularly when combined with available results from quantitative methods. Transit service in parks and gateway communities creates a combination of unique circumstances that make qualitative expert interviews appropriate. Perceived travel costs, access effects, and quality of life can be identified (*29*). In a case study of the transit system at Zion National Park conducted for research associated with this study, expert interviews revealed that a policy of no pets on buses has increased demand for pet boarding, creating a new growth area. Regression models and input-

output analysis would not have identified this new industry and would not have given insights to other parks to consider preparing to meet this visitor need in advance of the start of transit operations.

Expert interviews allow an evaluative examination of actual experiences with park transit. Beyond using broad-strokes methods as a predictive tool, retrospective evaluation of the actual impacts where transit has been implemented requires tools that allow a closer examination of local communities served; if no targeted data collection occurred before the change in transportation patterns, expert interviews and surveys in the local communities can extract information from local memory.

2.4. Conclusion

Transportation directly affects the cost of doing business in an area, the market reach for local businesses, personal travel costs, job access, and quality of life. Businesses might choose to invest in an area based on these factors, which affects the number of jobs and the amount of investment in the local community, as well as tax base (*29*). The concept of transportation-driven goods and service particularly pertains to the question of transportation service in national parks. Does the provision of transit service add to the park experience sufficient value to motivate visitors to spend money? Outside Denali National Park, several lodges offer private shuttles for guests to access the park and the railroad station. Does such service convince people to stay at lodges that provide transportation? Does such service attract more visitors, or do people prefer to plan their vacations in recreational areas that have no buses?

Through their active interest and involvement in park transit planning, gateway communities have demonstrated they feel that transit in parks will have significant

economic implications. The National Park Service is devoting time and resources to analyzing local situations, involving the public, and creating local rather than national strategies. The most successful regional transit systems will integrate their services not only with stops in the local gateway community, but also with connections to air travel, local transit, local intercity transportation depots, and so forth.

National Parks and gateway communities have a variety of analysis tools available to them to help understand the economic impact that transit brings. Analysts need to choose tools according to which questions need to be answered, whether the questions need to be answered on a regional or local scale, and when the analysis is to be performed relative to the implementation of transit service. Input-output models provide predictive regional information on quantitative indicators, such as employment and revenue across industries, but they give little information on what is already happening directly within gateway communities. For understanding impact in retrospect, personal interviews with key local stakeholders tap into local memory and perspective on transportation issues. Surveys administered regularly starting before transit implementation offer the most accurate information potential, and survey data can provide the basis for other quantitative analysis. A survey program should be factored into the overall transit and transportation planning program. Information gained in the survey program can contribute to other park, community, and business planning, as well.

2.5. Summary

National parks represent a national commitment to environmental preservation and recreation, and to local communities, they also represent economic survival. This chapter reviews several studies examining the economic impacts of national parks. Several

analysis tools that have been developed for determining economic impacts, particularly input-output models, surveys, and expert interviews, are described. For example, the U.S. Forest Service and the National Park Service have both developed input-output models to estimate the economic impacts of national parks on gateway communities. These models serve well as predictive tools of aggregate measures of performance on a regional scale, but the highly localized nature of gateway communities and park transit systems create the need for a finer grain of analysis. Each of the analysis tools is assessed from the perspective of its effectiveness in analyzing the economic impacts of transit service in gateway communities. Expert interviews and surveys provide the best means of evaluating gateway community experience with transit. The paper recommends that any study aimed at understanding the changes in business and community activities in response to the introduction of new transit service in gateway communities include surveys and stakeholder interviews as a necessary part of the study methodology.

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3.0 CASE STUDY SELECTION AND METHODOLOGY

3.1. Case Study Selection Criteria

The case studies focused on parks and gateway communities that have recently introduced or substantially expanded transit service. Candidate case studies came from a subset of a list of 90 parks identified by the National Park Service as providing transportation service in 2002. Through the use of selection criteria, this list was narrowed to a group of parks having comparable transit service and gateway community characteristics. Primarily, the case studies were oriented toward distinguishable gateway communities dependent on parks for economic vitality. These parks had land-based transit systems (as opposed to routes that can be served only by water or air transportation) that competed with or displaced private vehicle trips. As noted in chapter one, the study focused on parks that used alternative transportation systems to reduce congestion on roads in parks with high visitation.

The case study selection criteria included:

- **Pre-existing public road infrastructure**

  Several of the 90 parks that the National Park Service listed as having transit service were located on islands or cliffs… terrain inaccessible by private road vehicles. Many of these parks had no paved public road infrastructure to access major park features. For these parks, transit was the primary, rather than the alternative, form of transportation. Presumably, visitors to these parks had no expectation of private vehicle access, so the introduction of

transit systems had no impact on gateway communities arising from demand management or transportation alternatives.

- **Existence of land transit service**

  In order to investigate the economic impacts of transit as competition or replacement for private vehicle access, transit service needed to provide access to the same or comparable park locations. Even if a park had road infrastructure, plane and boat transit would not necessarily take visitors to the same locations they could access in their own vehicles, so parks that provided only air or water service did not enter into the study.

- **Existence of gateway communities (non-urban environment)**

  This study focused on impacts to gateway communities having direct and substantial linkages to national parks for their economic livelihood. Parks located within or near urban areas (population 50,000 or more) likely have a mix of economic drivers. In these places, this analysis would have difficulty isolating effects from changes in park transportation because too many other factors would impact the environment.

- **Over one million visitors annually**

  The study concentrated on parks with high levels of visitation and congestion, where vehicle activity threatened the environment and visitor experience, perhaps affecting economic vitality or growth in the area surrounding the park. By looking at the list of parks provided by the National Park Service, annual visitation over one million was considered a reasonable threshold.

- **Orientation toward transit rather than tour service**

  This study focused on general public access to park locations. Several park units allow commercial package tours to operate in the parks, but such operations typically differ from the public transit service targeted in this study in several ways (Table 3-1).

Table 3-1: Distinctions between Transit and Tour Service

Transit service typically has:	Tour service typically has:
o Limited or no park interpretation	o Extensive park interpretation
o No advance reservations	o Advance reservations
o Scheduled service where passengers board whichever vehicle arrives first at the transit stop	o One group moving together for a set period of time, such that the vehicle waits for the same group to re-board after visiting a stop
o Public sector subsidy to lower fares or make service free	o Private sector pricing to cover the costs of the service
o Public goals, such as economic development, congestion mitigation, public mobility, or environmentally friendly transportation alternatives	o Profit motive

Tours do not primarily serve the purpose of providing access to park locations. Tour transportation is also selectively available to visitors who pay a premium for the full private tour package. In some cases, the distinction between these two types of service blurs. For instance, park transit operators might offer interpretation, and tour operators might have frequent service where customers do not move as a single group with a single driver; however, in most parks, the distinction is clear enough to differentiate between transit

service offered for public transportation purposes and tour service offered as a private commercial tour package. Based on this distinction, this study examined only parks with transit service.

- **Comparison of similar conditions before and after service introduction**

  This research concentrated on changes in public transportation that have occurred since the 1990s. Narrowing the scope of research to this time frame controlled for changes in the national economy, levels of visitation, and changes in demographic cohort preferences.

- **Scale of Service**

  The transit service needed to have a service capacity and frequency sufficient to have a noticeable impact on visitation patterns. If an insignificant percentage of visitors used the shuttles, the service could be expected to have insignificant or immeasurable economic impacts on gateway communities.

3.2. Site Selection Process

Of the 385 parks in the national park system in 2002, the National Park Service identified 90 parks with some form of transportation service available (Table 3-2). These transportation services included a variety of modes, primarily bus, ferry, and airplane. Service in these parks was provided by the National Park Service, a contracted concessioner, local private transportation providers, local tour operators, or local government in the gateway community. To identify the case studies for this research, the criteria outlined in the research plan were applied in a tiered process, as described in the following pages.

Table 3-2: National Parks with Some Form of Transportation Service Available

Acadia National Park	Independence National Historical Park
Adams National Historical Park	Isle Royal National Park
Allegheny Portage Railroad National Hist	Jefferson National Expansion Memorial
Apostle Islands National Lakeshore	Kalaupapa National Historical Park
Big South Fork Nat River and Recreation	Katmai National Park & Preserve
Biscayne National Park	Kennesaw Mountain Nat Battlefield Park
Blue Ridge Parkway	Lake Chelan National Recreation Area
Boston Harbor Islands National Recreation	Lake Mead National Recreation Area
Boston National Historical Park	Lowell National Historical Park
Bryce Canyon National Park	Lyndon B. Johnson National Historical
Cabrillo National Monument	Mammoth Cave National Park
Canyon De Chelly National Monument	Manhattan Sites
Canyonlands National Park	Mesa Verde National Park
Cape Cod National Seashore	Minute Man National Historical Park
Cape Lookout National Seashore	Mount Rainier National Park
Channel Islands National Park	Natchez National Historical Park
Chesapeake & Ohio Canal Nat Hist Park	National Capital Parks-Central
Chiricahua National Monument	National Park of American Samoa
Crater Lake National Park	North Cascades National Park
Cumberland Island National Seashore	Organ Pipe Cactus National Monument
Curecanti National Recreation Area	Ozark National Scenic Riverways
Cuyahoga Valley National Park	Perry's Victory & International Peace
Denali National Park & Preserve	Pinnacles National Monument
Devils Postpile National Monument	Point Reyes National Seashore
Dinosaur National Monument	Rocky Mountain National Park
Dry Tortugas National Park	Salem Maritime National Historic Site
Eugene O'Neill National Historic Site	San Antonio Missions National Hist Park
Everglades National Park	San Francisco Maritime National Hist
Fire Island National Seashore	San Juan Island National Historical Park
Fort Matanzas National Monument	San Juan National Historic Site
Fort McHenry Nat Monument & Hist Shrine	Scotts Bluff National Monument
Fort Sumter National Monument	Shenandoah National Park
Gates of the Arctic National Park & Preserve	Sleeping Bear Dunes National Lakeshore
Gateway National Recreation Area	Statue of Liberty National Monument
Gettysburg National Military Park	Steamtown National Historic Site
Glacier Bay National Park & Preserve	USS Arizona Memorial
Glacier National Park	Valley Forge National Historical Park
Glen Canyon National Recreation Area	Virgin Islands National Park
Golden Gate National Recreation Area	Voyageurs National Park
Grand Canyon National Park	Wolf Trap Farm Park for Performing
Grand Teton National Park	Wright Brothers National Memorial
Great Smoky Mountains National Park	Yellowstone National Park
Gulf Islands National Seashore	Yosemite National Park
Harpers Ferry National Historical Park	Yukon - Charley Rivers National
Hot Springs National Park	Zion National Park

Out of the full list of 90 parks, thirteen had no road infrastructure, so private vehicles could not enter the parks (Table 3-3).

Table 3-3: Parks with No Road Infrastructure

Park Name	Region	Town	State
Gates of the Arctic National Park & Preserve	AR	Bettles	AK
Yukon - Charley Rivers National Preserve	AR	Eagle	AK
Apostle Islands National Lakeshore	MWR	Lake Superior	WI
Isle Royal National Park	MWR	Houghton	MI
Wolf Trap Farm Park for Performing Arts	NCR	Vienna	VA
Boston Harbor Islands National Recreation Area	NER	Boston	MA
Fire Island National Seashore	NER	Patchogue	NY
Statue of Liberty National Monument	NER	New York City	NY
Channel Islands National Park	PWR	Ventura	CA
Lake Chelan National Recreation Area	PWR	Stehekin	WA
USS Arizona Memorial	PWR	Honolulu	HI
Dry Tortugas National Park	SER	Key West	FL
Fort Sumter National Monument	SER	Charleston Harbor	SC

Regions: AR=Alaska Region, IMR=Intermountain Region, MWR=Midwest Region, NCR=National Capitol Region, NER=Northeast Region, PWR=Pacific West Region, SER=Southeast Region

Table 3-4: Parks Offering or Dependent on Non-land Transit

Park Name	Region	State	Type of System
Glacier Bay National Park & Preserve	AR	AK	Water & Air
Katmai National Park & Preserve	AR	AK	Plane, Water & Land
Curecanti National Recreation Area	IMR	CO	Water
Glen Canyon Nat Recreation Area	IMR	AZ	Water & Shuttle
Lake Mead Nat Recreation Area	IMR	AZ	Ferry
Perry's Victory & Intl Peace Memorial	MWR	OH	Ferry & Plane
Sleeping Bear Dunes Nat Lakeshore	MWR	MI	Water Transit
Voyageurs National Park	MWR	MN	Water Transit
Fort Matanzas National Monument	SER	FL	Water Transit
Wright Brothers National Memorial	SER	NC	Air Tours

Regions: AR=Alaska Region, IMR=Intermountain Region, MWR=Midwest Region, NCR=National Capitol Region, NER=Northeast Region, PWR=Pacific West Region, SER=Southeast Region

Among the rest of the 77 parks that did have road infrastructure, ten only offered transportation services by water or by air (Table 3-4). Others might have offered some land service because access to the park was impossible by private vehicle; however, these services in or to parks did not likely displace trips by private vehicles on land.

From the 67 remaining parks, 23 were located in or near urban areas with populations over 50,000 people (Table 3-5).

Table 3-5: Parks Located near Urban Areas

Park Name	Region	City	State
San Antonio Missions National Historical Park	IMR	San Antonio	TX
Cuyahoga Valley National Park	MWR	Cleveland	OH
Jefferson National Expansion Memorial	MWR	St Louis	MO
Chesapeake & Ohio Canal National Historical Park	NCR	Potomac River	DC
National Capital Parks-Central	NCR	Washington	DC
Adams National Historical Park	NER	Quincy	MA
Boston National Historical Park	NER	Boston	MA
Fort McHenry National Monument & Historic Shrine	NER	Baltimore	MD
Gateway National Recreation Area	NER	New York City	NY
Independence National Historical Park	NER	Philadelphia	PA
Lowell National Historical Park	NER	Lowell	MA
Manhattan Sites	NER	New York City	NY
Minute Man National Historical Park	NER	Concord	MA
Salem Maritime National Historic Site	NER	Salem	MA
Valley Forge National Historical Park	NER	Philadelphia	PA
Cabrillo National Monument	PWR	San Diego	CA
Golden Gate National Recreation Area	PWR	San Francisco	CA
Point Reyes National Seashore	PWR	Point Reyes	CA
San Francisco Maritime National Historical Park	PWR	San Francisco	CA
Everglades National Park	SER	Miami	FL
Gulf Islands National Seashore	SER	Pensacola	FL
Kennesaw Mountain National Battlefield Park	SER	Atlanta	GA
San Juan National Historic Site	SER	San Juan	PR

Regions: AR=Alaska Region, IMR=Intermountain Region, MWR=Midwest Region, NCR=National Capitol Region, NER=Northeast Region, PWR=Pacific West Region, SER=Southeast Region

Of the 44 parks left, 26 served fewer than one million visitors in 2001 (Table 3-6).

Table 3-6: Parks with Fewer than One Million Visitors in Fiscal Year 2001

Park Name	Region	Town	State	Visitors
Denali National Park & Preserve	AR	Healy	AK	360,191
Canyon De Chelly National Monument	IMR	Chinle	AZ	840,065
Canyonlands National Park	IMR	Moab	UT	368,950
Chiricahua National Monument	IMR	Wilcox	AZ	83,894
Dinosaur National Monument	IMR	Vernal	UT	329,233
Lyndon B. Johnson Nat Historical Park	IMR	Johnson City	TX	104,134
Mesa Verde National Park	IMR	Cortez	CO	511,764
Organ Pipe Cactus National Monument	IMR	Ajo	AZ	318,668
Scotts Bluff National Monument	MWR	Gering	NE	111,372
Harpers Ferry National Historical Park	NCR	Harpers Ferry	WV	321,022
Allegheny Portage Railroad Nat Hist Site	NER	Gallitzin	PA	137,543
Steamtown National Historic Site	NER	Scranton	PA	138,272
Crater Lake National Park	PWR	Crater Lake	OR	444,583
Devils Postpile National Monument	PWR	Mammoth Lakes	CA	165,841
Eugene O'Neill National Historic Site	PWR	Danville	CA	3,612
Kalaupapa National Historical Park	PWR	Kalaupapa	HI	96,143
National Park of American Samoa	PWR	Pago Pago	AS	Est:1,800
North Cascades National Park	PWR	Marblemount	WA	536,834
Pinnacles National Monument	PWR	Paicines	CA	183,823
San Juan Island National Historical Park	PWR	Friday Harbor	WA	274,034
Big South Fork Nat River and Rec Area	SER	Oneida	KY	898,478
Biscayne National Park	SER	Fort Smith	MT	237,238
Cape Lookout National Seashore	SER	Harkers Island	NC	561,976
Cumberland Island National Seashore	SER	Saint Marys	GA	43,816
Natchez National Historical Park	SER	Natchez	MS	293,133
Virgin Islands National Park	SER	Saint John	VI	713,462

Regions: AR=Alaska Region, IMR=Intermountain Region, MWR=Midwest Region, NCR=National Capitol Region, NER=Northeast Region, PWR=Pacific West Region, SER=Southeast Region

Although Denali National Park and Preserve reported only 360,191 visitors in 2001, this park remained in consideration because two important factors affected the visitation number. First, the short summer visitor season of parks in Alaska compresses visitation into a limited amount of time. The density of the visitor season could lead to more congested conditions than southern parks having higher annual visitation numbers, but a longer visitor season. Second, visitors to Denali may only enter the park interior by shuttle, bicycle, pack animal or foot. Most visitors choose the shuttle, but the National Park Service caps shuttle capacity to control impact on the natural environment. With a capped capacity, the number of people who wanted to enter the park might have been far higher than the reported number of visitors indicated because some people might not have found seats on buses. With the potential influences of the bus capacity caps and the short visitor season, Denali National Park and Preserve remained in consideration for this analysis, despite falling short of the criterion for one million visitors.

Seven more parks identified the bus service offered in or through the parks as tour products rather than transit (Table 3-7).

Table 3-7: Parks with Transportation Primarily Associated with Tour Packages

Park Name	Region	Town	State	Visitors
Grand Teton National Park	IMR	Moose	WY	2,531,844
Yellowstone National Park	IMR	Yellowstone Nat Park	WY	2,769,775
Ozark National Scenic Riverways	MWR	Van Buren	MO	1,497,988
Shenandoah National Park	NER	Luray	VA	1,514,739
Blue Ridge Parkway	SER	Asheville	NC	19,663,101
Mammoth Cave National Park	SER	Mammoth Cave	KY	1,889,096
Mount Rainier National Park	PWR	Ashford	WA	1,338,235

Regions: AR=Alaska Region, IMR=Intermountain Region, MWR=Midwest Region, NCR=National Capitol Region, NER=Northeast Region, PWR=Pacific West Region, SER=Southeast Region

Three more parks fell out of the analysis because the existence of long-time stable transit service would have made it difficult to differentiate the impacts of new service from other trends occurring in the area (Table 7). Glacier National Park and Gettysburg National Military Park have offered some transit service for over a decade without making major expansions, enhancements, or changes. Because these systems have been part of the operations for a long time, isolating the impact they have had on local economies is difficult. Grand Canyon National Park has operated its transit service since 1974; incremental changes included implementing private vehicle restrictions along the South Rim of the canyon in the last decade and expanding to year-round service in 2000.

Table 3-8: Parks without Recent Transit Service Expansions or Enhancements

Park Name	Region	Town	State	Visitors
Glacier National Park	IMR	Kalispell	MT	1,718,907
Gettysburg National Military Park	NER	Gettysburg	PA	1,779,610
Grand Canyon National Park	IMR	Grand Canyon	AZ	4, 104,809

Regions: AR=Alaska Region, IMR=Intermountain Region, MWR=Midwest Region, NCR=National Capitol Region, NER=Northeast Region, PWR=Pacific West Region, SER=Southeast Region

Finally, two parks fell out of the analysis for individual reasons. Great Smoky Mountains National Park had only small-scale transit service. This park has been the subject of a transit demonstration project owned and operated by the City of Gatlinburg, Tennessee. Since 1996, the National Park Service has allowed the city to offer shuttle service between the city, a visitor center, a trailhead, and a campground. The experiment has been popular and has experienced high ridership; however, the system was running

with only one vehicle during the time of this research, thus an insufficient level of transit service was available for comparison purposes.

Rocky Mountain National Park ran intermittent transit service in school buses for a number of years before transferring to contracted service on new vehicles in 2001. That year's ridership of 247,000 surpassed projections, showing a 50 percent increase in patronage over previous demand for the school bus service. Although ridership numbers show an impact on visitors, the new service operates entirely within the park. Visitors must drive into the park, and then transit service is free with the entrance fee. A visitor has no reason to get out into the gateway community, so the gateway community likely experiences distorted impact from transit service when compared with the impacts felt by gateway communities with their own transit connections to parks.

3.3. Final Park Selection

The remaining parks provided seven case studies for this research (Figure 3-1). This list included parks in nearly all regions of the continental United States.

3.3.1. Northeast Region (52,801,345 recreation visits in 2001)

The Northeast Region attracts visitors from several regional cities. The parks are generally located within less than a day's drive of a major population center. The geographies of the two parks selected from this region, Acadia National Park and Cape Cod National Seashore, intersperse with local communities. Both Acadia and Cape Cod developed transit systems that integrated with local communities

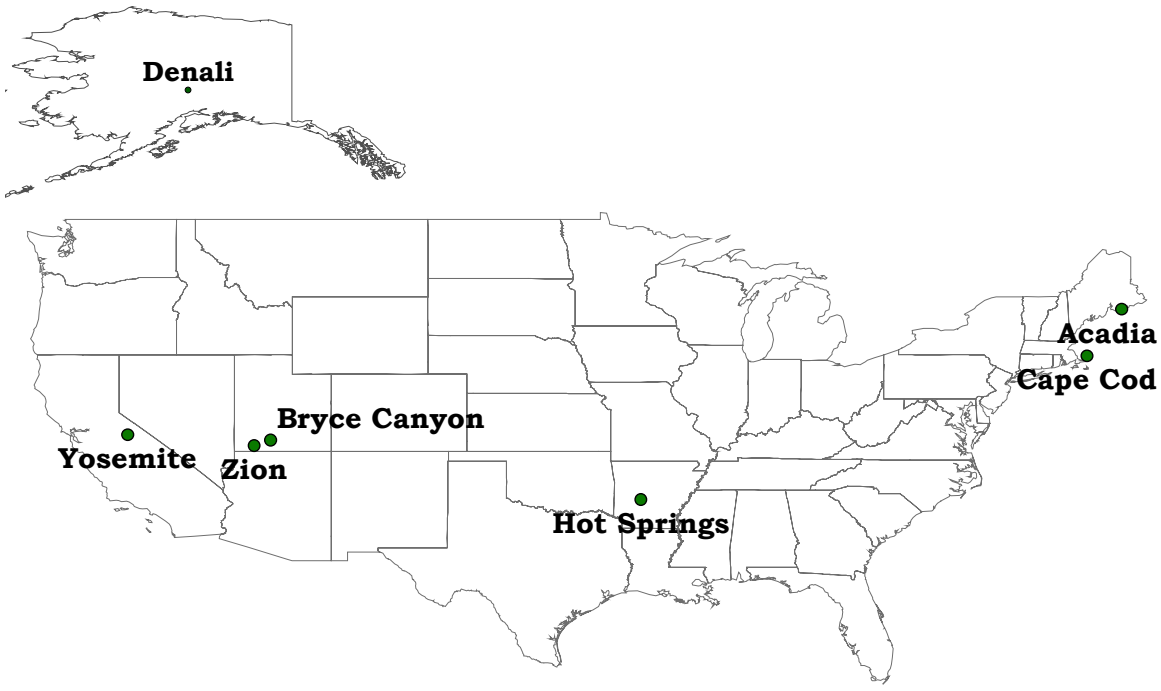


Figure 3-1: Case Study Parks

- **Acadia National Park** in the middle of coastal Maine spans 47,633 acres on islands and peninsulas connected by state highway and ferry to the mainland. Since 1999, concessioners have operated buses owned by the National Park Service. The service ran from June 23rd through Labor Day (6:50 a.m. to 10:20 p.m.) in 2002 with an operations and maintenance cost of $500,000; Operations extended to Columbus Day in 2003. Ridership estimates in 2002 showed an increase of seventeen percent over the 239,000 passengers in 2001.
- **Cape Cod National Seashore** stretches across 43,604 acres of shoreline on Cape Cod in Massachusetts. It interweaves with local communities along the

narrow terrain of the Cape. Two transit operations currently serve this park from 5 a.m. to 1 a.m. from Memorial Day until Columbus Day:

- The National Park Service started operating a service with school buses to a beach in 1988 and restricted private vehicle access. A fleet of used propane buses was eventually phased into service, and in 1997, two open air electric trams with trailers traveled the route. Cape Cod National Seashore now uses two new Ford Chance coaches with the previously owned trailers. Because these vehicles, which can seat 25-30 on a tram and 30-35 on a trailer, cannot accommodate wheelchairs, disabled visitors may drive to the beach in private vehicles.
- In 2000, Cape Cod National Seashore started offering service between the park and local communities on Bluebird buses seating 23-27 people. The National Park Service owns these buses, and the Cape Cod Transit Authority operates them. These vehicles comply with standards for accessibility under the Americans with Disabilities Act. While this service does not presently link to a local airport, the park is planning to make this connection, and the current service does connect to regional ferry service.

3.3.2. Midwest Region (20,604,856 recreation visits in 2001)

The Midwest Region has a small number of large population centers, compared to other regions in the continental United States. Visitors might drive long distances to reach the destination of a national park. With large open spaces and room for parking, the culture of much of the Midwest has evolved without transit. The cultural propensity

toward the private vehicle makes a study of the impact of changes to sustained transit service between a park and an associated gateway community particularly interesting.

- **Hot Springs National Park** sits on 5,500 acres of land integrated with the city of Hot Springs, population 35,000 people. Both the city and the park exist due to the water flowing from the southwestern slope of Hot Springs Mountain. The park has no entrance stations because it sits alongside the city, thus people can access the park at numerous locations. For the past 22 years from Memorial Day through Labor Day, the city has run a fleet of three trolleys to the park visitor center and to a tower on Hot Springs Mountain between 9:40 a.m. to 9:40 p.m. In August 2001, the system changed from contract service to operations by the City of Hot Springs with a resident advisor. With the addition of a new stop, ridership tripled in 2002.

3.3.3. Intermountain Region (41,340,097 recreation visits in 2001)

Parks in the Intermountain Region have a history of transportation innovation. In the early years of the National Park Service, this region inspired the National Park-to-Park Highway movement, which paved the way for people to take their private vehicles to parks. This legacy has brought large numbers of vehicles into the major parks of the intermountain region. Several parks in this region have taken the lead in recent years to spearhead transit initiatives, including the use of modern transit vehicles and restrictions on private vehicle use. With these initiatives, Intermountain Region parks will likely offer strong examples of potential economic impacts of transit on gateway communities.

- **Bryce Canyon National Park** in Utah contains 35, 833 acres of spires from eroded sandstone, limestone, and mudstone. The park began a ten-year $18

million contract in 2000 for the Bryce Canyon Shuttle to operate 8 a.m. to 8 p.m. from Memorial Day through the end of September. The shuttle stops at a local inn, an adjoining campground, and a staging area, as well as the park; future plans call for a route to serve another nearby town. The mandate for transit at Bryce specified that the service must become self-sustaining, but the subsequent introduction of the National Parks Pass increased the number of non-paying visitors to the park from 36 percent in 1999 to 68-72 percent in 2001. On top of this challenge, the park will need to contend with the question of what to do for vehicles at the end of the contract, since the National Park Service does not own the ones currently running. Bryce Canyon National Park poses an interesting case study for the economic impact analysis because this park will need to face the question of if and how it should plan the continuation of transit service, now that it has existed. The results of this case study will likely contribute directly to the park's own decision-making process.

- **Zion National Park** encompasses 229 square miles of canyons and cliffs at the junction of the Colorado Plateau, the Great Basin, and the Mojave Desert provinces in southern Utah. The park runs 30 buses and 21 trailers in tandem combinations of two vehicles. Since May 2000, the service has operated seasonally, now running from March 28th through late October. During the season, the Park denies private vehicle access to the Zion Canyon Scenic Drive. Only the shuttle bus reaches the most popular attractions of the park. The gateway community worked closely with the Park to design the system to

integrate with the community and provide park-and-ride facilities outside the park in a way that would protect the character of the community.

3.3.4. Pacific West Region (54,584,871 recreation visits in 2001)

As in the Northeast Region, parks in the Pacific West Region often exist in close proximity to major population centers. In addition, the mountains and valleys of the region create pockets where air pollution can collect, making the effects of traffic congestion felt more deeply.

- **Yosemite National Park** spreads across 761,266 California acres in the Sierra Nevada with cliffs, waterfalls, meadows, and forests. Two transit services operate at Yosemite: the park's transit service and the Yosemite Area Regional Transit Service (YARTS).
    - Inside the park, 20-30 vehicles seating 50 passengers each offer service from 7 a.m. to 10 p.m. every five minutes during peak season or every 20 minutes in the winter. This transit started 25-30 years ago, and plans for the future include alternative fuel buses, a route expansion, and private vehicle restrictions.
    - YARTS, a collaborative effort including the California Department of Transportation, some surrounding counties, and other participants, launched service with a contractor in 1998 with 40-passenger buses making three daily round trips into the park from the gateway communities. One of the communities served, Merced, includes a small airport, and planners are examining the possibility of extending to the airport in Fresno.

3.3.5. Alaska Region (2,055,152 recreation visits in 2001)

People travel to the Alaska Region typically on planned vacations. Parks in the Alaska Region generally fell out of the selection because of low visitation. Of the fifteen parks in the region, none received over one million visits. The region has lower visitation than regions in the continental United States experience, but one would expect a longer length of visit than many of the easily accessible parks in the rest of the nation that have heavy day-trip activity. As noted earlier, one park was selected for a case study despite its low visitation.

- **Denali National Park and Preserve** contains Mount McKinley, the highest mountain in North America, as part of six million acres of preserved sub-arctic land. With 2001 visitation of 360,191, this park attracts more visitors than any other park in the Alaska Region of the National Park Service. The short visitor season runs from late May through early September when daylight hours are long. Private vehicles may drive along 14.8 miles of Denali Park Road to the Savage River Bridge, but only shuttle buses, bicycles, pack animals, and hikers are permitted to go further inside the park. Shuttle bus capacity is purposely limited to protect the natural resources, which implies that not all visitors who want to enter the park can do so with the shuttle system.

3.3.6. The Southeast Region and the National Capitol Region

These two regions do not appear in this list of proposed parks. The National Capitol Region falls out of the analysis because the influence of park transportation systems cannot be isolated from the urban influence of the Washington metropolitan area. Parks

in the Southeast Region fell out of the analysis based on various case study selection criteria, as depicted in the tables in section 3.2.

3.3.7. Summary of Selected Case Studies

The seven parks selected for case studies posed an array of characteristics for comparison and analysis (Table 3-9:). This cross section of parks ranges from mountainous parks to coastal parks. Visitors might come to these parks as destinations or en route to other places. It represents most of the regions of the National Park Service, and it includes transit efforts initiated by the National Park Service or by local communities. Hot Springs gives an example of what happens when the local community takes the initiative to serve a park. Acadia, Cape Cod, and Hot Springs National Parks offer scenarios where park officials have worked with gateway communities to create an integrated transit design. Zion National Park and Denali National Park and Preserve show the effects of restrictions on private vehicle access.

The seven parks selected offer case studies of the latest transportation innovations applied in the context of national parks. These case studies will provide a rich basis for analysis of economic impacts of transit in parks, according to the variety of implementations in the current state of the art for transit service in national parks.

Table 3-9: Parks, Gateway Communities & Transit Systems Targeted

Park Name	Region	Gateway Community	2001 Visits (millions)	One-way Fare	Passengers per Vehicle	Standees	ADA Accessible	Fleet Size (vehicles)	Peak Headway (minutes)	Operating Since	Recent Changes	Transfers to Airport	Serves Community	2001 Ridership	Road restrictions
Acadia National Park	NER	Bar Harbor, ME Mt. Desert Island	2.5	$0	28	✓	✓	17	15	1999	1999	✓	✓	239,000	×
Cape Cod Nat. Seashore	NER	Provincetown & Truro, MA	4.4	$0 $1	65 27	× ×	× ✓	2 5	15 20	1988 2000	1988 2000	× O	× ✓	Unreported 100,000	✓ ×
Hot Springs National Park	MWR	Hot Springs, AR	1.3	$0	21	✓	✓	3	30	1980	2001	×	✓	4,607[#]	×
Bryce Canyon National Park	IMR	Garfield County, UT	1.1	$0	28	✓	✓	15	6	2000	2000	×	✓	400,000	×
Zion National Park	IMR	Springdale, UT	2.2	$0	68	✓	✓	30/21[▲]	6	2000	2000	×	✓	2,128,000	✓
Yosemite National Park	PWR	Mariposa, Tuolumne, Merced, Madera, & Mono Counties, CA	3.4	$0 $2-$20[*]	50 40	×	✓	30 --	5 6/day	1970s 1998	1970s 1998	× O	× ✓	2.7 million 57,569	O
Denali National Park & Preserve	AR	Healy, AK	0.4	$17.50-$33.75[*]	44	×	✓	130	66/day	1972	1990	×	×	~180,000	✓

✓ = Yes, × = No, O = Not yet; [#]Ridership July 11- Sep 28, 2002; [▲]Buses/Trailers; [*]Round trip fare range

Regions: AR=Alaska Region, IMR=Intermountain Region, MWR=Midwest Region, NER=Northeast Region, PWR=Pacific West

3.4. Methodology

To realize the goal of fully understanding the economic impacts experienced in gateway communities with existing transit service, case study research featuring expert interviews was selected as the methodology to provide the most comprehensive information. The objectives were to characterize parks and gateway communities that have implemented transit, to identify the goals and performance of the transit systems, and to identify economic effects of transit and the factors that contributed to them.

Descriptive case studies defined the context of parks and gateway communities and provided data for comparison across parks. This type of research must uphold construct validity through a sufficiently operational set of measures, such that the data do not reflect subjective judgments. Using multiple sources of evidence helps attain construct validity. Information for the case studies in this research came from a combination of interview results, public documents, direct observation of how the transit system served the local environments, and archival data on visitation and travel patterns. To attain the objective of characterizing parks and gateway communities with transit, multiple case studies provided a framework for comparing transit impacts in a variety of environments and service design. In this embedded multiple-case study analysis, public documents and archival records established the environments for each case study. Local stakeholders of various interests (representatives from the towns, parks, and transit operators) were interviewed as one way to determine transit's impact. For each of several parks, the case studies offered information on how transit has impacted segments of local communities and overall local regions as units of analysis. Transit performance, particularly in terms of changes in travel behavior and economic impacts in gateway communities, becomes

the dependent variable for this analysis affected by the independent variables of local area characteristics, transit service design, and implementation plans and procedures.

3.5. Public Information Collection

Several public information sources framed the context for individual case studies (Table 3-10). These information sources allowed comparison of case study results in the context of contributing factors. In a multiple case study design, the results of each study should be treated as the results of multiple experiments, rather than data points contributing to the sample of a single experiment (*56*). In comparison of the park cases, the ones with similar characteristics according to a given area of inquiry were expected to yield similar results (literal replication), while theoretical replication would occur where parks with contrasting characteristics produced predictably different results.

3.6. Data Interpretation

Data from the public documents and archival records provided the basis for describing and comparing case study results. The data described the economic environment of local communities, general tourism trends for parks, and travel behavior in the park regions.

Table 3-10: Public Documents and Archival Records Used in Case Studies

Area of Inquiry	Information Type	Information Source
Geographic context	Map documents and data	• GIS data for the park and gateway community • Transit route maps • Business addresses
Local environment	Demographic data and reports	• U.S. Census data • County employment and wage reports • Chamber of commerce membership • Registered business licenses (federal, state, county, or city)
Local goals, attitudes, and integration of transit in local planning	Planning documents	• Park general management plans • Local comprehensive or general plans • Previous studies (if available)
Visitor characteristics	Study results	• Park visitor use studies • Local or state tourism agency reports
Performance	Collected data	• Transit ridership • Park visitation

3.6.1. Economic Environment

Based on the categories of the 1987 Standard Industrial Classification (SIC) system or the 1997 North American Industry Classification System (NAICS) used by the United States Census Bureau (*57*), gateway community businesses fell into classification categories related to tourism (Appendix A). For the purposes of this research project, traditional business sectors aggregated into new categories that better described small tourism communities. This aggregation system allowed a basis for comparison of gateway communities according to their dependence on tourism and the balance of businesses according to tourism categories.

Some businesses naturally fell into multiple categories. For instance, bed and breakfast establishment offer both lodging and food. Because data inputs came from official lists of state governments or the U.S. Census Bureau, such discrepancies were resolved according to official standards. Typically, such businesses appeared multiple times in the business lists, thus they appeared multiple times in the characterizations of communities.

Table 3-11: Aggregate Business Sector Categories

Category	Description
Food	The food category included any means of obtaining something edible. Businesses in this category ranged from fine dining restaurants to delicatessens and coffee shops. Grocery and convenience stores also fell under this designation.
Lodging	Lodging included any place that travelers paid to rest for a night, such as lodges, hotels, motels, inns, bed-and-breakfasts, hostels, and campgrounds.
Service	Service sector businesses involved any tourist monetary interaction involving no exchange of material items. Services included tours, bicycle rentals, time in spas, golf games, and other activities. Services such as appliance repair were not considered related to tourism; therefore, they did not appear in this category.
Retail	The retail category related only to retail sales geared toward tourists, such as souvenir shops and memorabilia. Tire sales, office supplies, and other retail establishments geared toward the daily life of residents did not fall in this category.
Other	Other businesses included all establishments listed in the Department of Commerce NAICS or SIC systems that did not serve tourists.

3.6.2. Tourism Trends

The impacts of transit systems needed to be isolated from general trends in tourism. The Public Use Statistics Office of the National Park Service tracks the number of visits

each month to each park in the service. These numbers provided the basis for analysis of tourism trends at each of the case study parks. The national database also gave context for national trends and the experience of parks in the immediate regions surrounding case study parks. Examinations of visitation data showed patterns for each year of visitor traffic in peak seasons and shoulder seasons, as well as multi-year trends.

3.6.3. Travel Behavior

Several aspects and measures of travel behavior helped depict the impact of transit on the flow of visitors through parks and gateway communities. Where data existed, visitor use studies identified major cities or regions from which each parks attracted visitors, as well as what proportions of visitors used various modes of transportation to arrive. Transit ridership data maintained by transit operators indicated how many trips people took by transit. Trends in these data showed whether people used transit more or less over time as the systems matured (changes in transit service were identified as external factors influencing ridership). Different transit operators maintained different levels of detail in their ridership data. Where possible, travel behavior was examined by time of day and by boardings per geographic location. Ridership surveys conducted by transit operators often indicated rider characteristics, such as the proportions of visitors versus local workers using transit. Visitation counts and ridership numbers, while not directly comparable, were brought together to show the magnitude of influence the case study transit systems had on park and local circulation through the average number of transit trips per visitor. This information brought broad strokes insight into the extent to which visitors accepted and used the transit systems.

3.6.4. Goals, Planning, and Strategies

The goals established for transit service and the strategies set forth to reach those goals affect the ways in which transit service impacts travel behavior and local economies. Typically, park general management plans identified the goals of each transit system, and local planning strategies revealed how gateway communities were taking advantage of transit as a tool for economic development. Beyond the identified planning, transit systems were compared against each other and against current transit practice to identify potential ways to develop practices that encourage positive impacts. For instance, case studies included investigation into each site's relative investment in transit operations and infrastructure. Also, partnering practices and public communication strategies received attention.

3.7. Pilot Case Study

Glacier National Park and its surrounding area served as a pilot case study. Glacier runs a small shuttle service for hikers, but the system had not grown in a number of years, which eliminated this park from the official study candidates; however, the 1992 *Glacier National Park General Management Plan* called for a study of transit, and ongoing transportation initiatives there involved transit planning. With transit changes on the minds of the local community, Glacier offered an opportunity to identify stakeholders, explore the geographic extent of transit's impact, and test the interview technique. The pilot site visit occurred July 6th through July 13th, 2002.

3.8. Case Study Site Visits

Site visits occurred during shoulder seasons in fall 2002 and spring 2003. Site visits were scheduled during shoulder seasons to avoid requesting interview time from people preoccupied with peak season activity. The visits typically lasted between four and five days. Two to three days were needed to interview local participants and stakeholders of the transit system. Two days were spent observing the transit system design, looking at the land use of the town, talking informally with locals, getting data from local agencies, reviewing notes, and strategizing information gathering from the field.

3.8.1. Site Visit Interviews

More than 100 personal interviews with key local stakeholders provide the most comprehensive source of information relating to the impacts of transit service. Interviews allow post-implementation evaluation of qualitative changes in community activities based on the perceptions of the people closest to the situation; where possible, quantitative trend indicators should supplement the interview data to truth the findings against inaccuracies or biases of local memory.

Every locality had a core group that had been working on transit and/or the associated community interaction. For each case, representatives of various stakeholder groups received requests for interviews (Table 3-12).

The number of interviews varied by case, ranging from five to twenty on a site visit. Some parks had included more stakeholders than others in the transit planning process, and some involved multiple gateway communities. During the interview planning process, local stakeholders were asked who else should be interviewed. The tone and detail of the questions changed according to the needs of an individual interview. In

these small town settings, people often blurred traditional functional categories: some interviewees did not have answers to questions typically posed to someone in their positions, but they might have had deep knowledge of other information relevant to this study that would not traditionally fall under their purview. In some situations, people who had held positions for a matter of months were forgone, while people who had participated heavily in the planning process with no official title were included. Most everyone who was called for an interview agreed to participate.

Table 3-12: Stakeholder Groups Targeted for Interviews

Group or Sector	Possible Representatives
The business community	Chambers of commerce Tourism agencies Park concessioners
The local population	Elected representatives (mayors or council people) Town managers
Local economic development planning	Town planning departments Planning commissioners
Transit operations	Transit operators
Park administration	Park superintendence Concessioner liaisons
Nonprofit organizations	Friends groups Natural history associations
General local knowledge	Varied titles

The interviews were designed to achieve multiple objectives. Where no measured data existed, interviews pulled on local memory to obtain information on transportation and economic patterns before and after transit implementation. The interview forum also created means for open-ended information gathering of impacts that might not have been foreseen, such as the emergence of demand in new industries. Finally, the interviews

allowed a means of understanding local expectations of the impact of transit, how well experience matched expectations, and the effects that locals attributed to transit service. The qualitative interviews provided a medium for going beyond interpretation of numerical data to consider potential explanatory factors.

For the interviews, an unstructured discussion, which typically lasted 1.5 hours, started with the interviewee telling the story of the need for transit, its intended impacts, and results observed and heard from others. This step filled most of the interview to get the perspective of what the interviewee deemed important. The interview was then guided to ensure several primary topic areas were covered:

- System design: The interviewee's perspective on what was important in terms of transit system design and how well the interviewee felt the system met those design elements.
- The local economy: Interviewees were asked to describe their sense of recent trends in the local economy. Sometimes, they expressed direct experience; other times, they told of the experience of other people in the community. In other cases, they talked of general trends in local tourism, and they speculated on causal factors. People define the local economy according to individual definitions, and many of the types of economic impacts felt in gateway communities defied typical inquiry into impacts. Interviewees described what they had experienced in their own businesses, anecdotal stories they had heard in the community, and perceptions of larger impacts felt across the communities.

- Finance: If the stakeholder had perspective on the financial situation of the transit system, then the financial decision-making process and priorities needed to be discussed.
- Public relations: The stakeholder should have expressed the perceived efforts for public relations in the transit planning process and the effectiveness of those efforts.
- Relationships between stakeholders: In all cases, interaction or lack of interaction between the stakeholders played a major role in how well transit systems served all destinations, including park attractions, lodging, restaurants, shops, and service businesses. The relationships developed affected route design, stop placement, bus frequency, and the level of information provided to visitors. Such results affected the attractiveness of transit to visitors, which in turn would presumably affect how many people rode buses and the extent to which transit impacted local economies. Interviews gleaned whether stakeholders resented each other, spoke congenially, or genuinely partnered to understand and address each others' needs.
- Traffic: People with long-term experience in the area offered perspective on traffic and parking conditions before and after the introduction of transit.
- Trends and impacts: Interviewees were encouraged to speculate on forces affecting local economies and park visitation, and longer term trends that shaped conditions of the local areas. Specific to transit, people expressed impacts or the lack of anticipated impacts they thought could be attributed to transit.

For all interview topics, interviewees were encouraged to discuss early expectations, actual manifestations, and future implications created by the transit service. In some

instances, alternative transit plans and local opinions on future directions for transportation illuminated the understanding of local transportation.

Under these non-identical interview guidelines, the interview data collection methodology did not require review by the Office of Management and Budget under the Paperwork Reduction Act of 1995.

3.8.2. Direct Observation of Sites

Beyond the interviews, site visits included direct observation of transit environments and transit system designs. If the transit system was running during the shoulder season, site observation included riding the routes to get a feel for placement of the stops and how they served the communities and the parks. If transit operations were closed for the season, the routes were driven by car. In terms of route structure and in terms of stop design, how well did the systems provide efficient operations? How well did they serve local businesses? Was the design cost effective? How well did the design balance these factors, and did the natural environment of the community facilitate or obstruct this balance? These and other factors associated with transit systems and service were considered in the context of how they might affect travel behavior and local economies.

In the communities, observations were made of land use, types of commercial establishments in the area, and their proximity to transit. Site design and user friendliness also received attention. How had businesses adapted to the transit environment? Did businesses and visitor centers offer information on transit service, and could visitors find information on the businesses served by transit? Did they modify structures to facilitate public transportation? The tangible presence of transit systems was considered as a variable affecting the likelihood that visitors would ride on public transportation.

3.9. Project Synthesis

Final results from the case studies were put into the context of the economic environments and goals for each gateway community and park. The results of the case studies and data interpretation formed a mixed qualitative and quantitative analysis of each environment, and these individual case study results came together in an analysis across the case study environments.

3.9.1. Individual Case Study Results

Individual case study results appearing in the appendices looked at the specifics of the first objective, which related to what experience has already occurred with transit. As a general rule, interviews and public documents showed how and why things happened, identifying goals and motivations. Data from archival records indicated when things happened and the magnitude of changes.

Public documents and archival records provided background on each area, and direct site observations investigated the basic scenario of each case, as well as the issues raised in stakeholder interviews. Where possible, researcher observations were supported by original photography. Data from these sources established the facts of each case study and provided information to support or refute hypotheses about local experience transit.

Interviews targeted people who could represent stakeholder interest groups, so interviewee statements of policy and history from their stakeholder groups' perspectives were considered to be accurately representative. Statements of fact or figure were checked against public documents and archival records. When one interviewee commented on the position of another stakeholder group, statements were checked across interviews for potential bias of perspective, potentially with a direct question to the other

stakeholder representative. If interviewees made statements of trends or forces affecting the general region, research documentation was requested, or the speculation was attributed directly to the stakeholder group making the statement. When interviewees stated personal opinions or speculated on general opinion, such opinions needed to appear in notes from multiple interviews before they appeared in reported results; agreement from multiple stakeholders was noted, or opposing views received attribution to their respective stakeholders.

3.9.2. Discussion of Results of All Case Studies

The evaluations of all case studies contributed to a discussion to identify important factors, impacts, and policies with relevance for other parks and communities implementing transit. Case study transit systems were compared on the basis of variability (or comparability) of park and community environments, local goals for alternative transportation, and service design. Interview findings from particular stakeholder representatives, such as chambers of commerce, were considered across all case studies to identify similarities and differences in approaches, as well as initiatives that might appear in one case study and might benefit another region. The impacts experienced in the different areas were considered comparatively.

From this analysis emerged common elements in the multiple case study analysis, as well as unique, but relevant, issues. These elements contributed to a comparative discussion of best practices and outcomes that can be anticipated in other parks implementing transit systems.

3.9.3. Performance Measurement Recommendations

From the synthesis of multiple case studies emerged recommendations to address the second stated goal of the research project: to set up performance monitoring. The discussion of multiple case studies resulted in the identification of best practices and recommendations for performance monitoring in the context of goals for both park and community partners. These findings were placed in the general context of best practice for performance monitoring for transit service, resulting in recommendations for recreational area transit planning.

3.10. Summary

The research results for this project come out of multiple case studies conducted at seven parks. Case study parks exist in non-urban areas, represent most of the regions in the national park system, receive over one million visitors annually, and use land-based transit service that has had substantial changes in recent years. Data for the case studies came from site visits, interviews with stakeholders, public documents, and archival records. Combined results of case studies showed the types of planning and decision making that went into the systems, the service outputs of the process, and the outcomes of visitor behavior, economic impacts, and other results that occurred based on transit service introduction or modification.

(*56*) Yin, Robert K. *Case Study Research: Design and Methods, Second Edition*, Sage Publications, Thousand Oaks, 1994.
(*57*) U.S. Census Bureau, "1997 Economic Census: Bridge Between NAICS and SIC," http://www.census.gov/epcd/ec97brdg/.

4.0 RESEARCH RESULTS

4.1. Introduction

The conceptual framework established in section 1.3 provides the organizing structure for this chapter. For purposes of understanding the results of this research, and for identifying the important contributions this research makes to planning practice, Figure 4-1 repeats this framework. The next section discusses external factors that most likely influenced outcomes of transit service. The subsequent section presents the results of the research with respect to the inputs of planning and decision-making approaches used in the case study communities. The next section discusses the outputs of transit service as they manifested at case study locations, and the outcomes of transportation strategies implemented in national parks. Chapter five uses these results to recommend

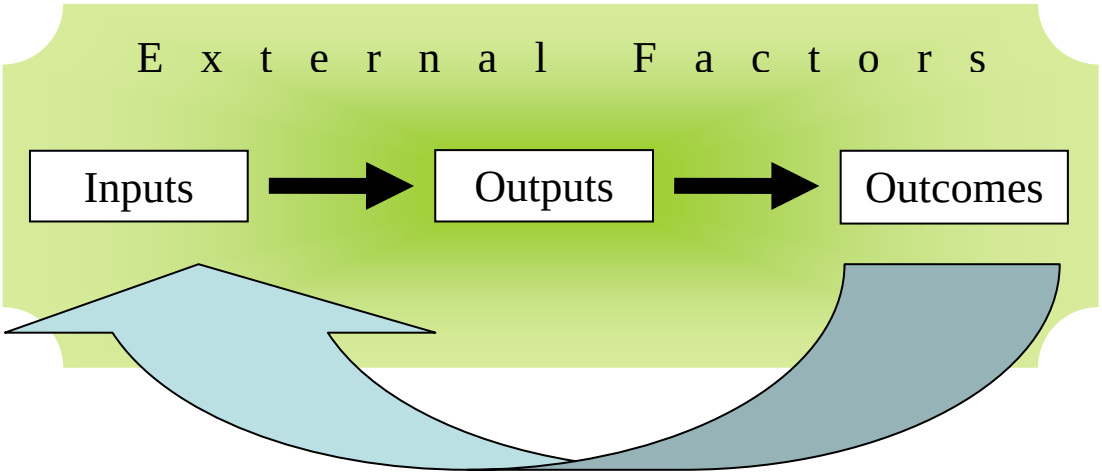


Figure 4-1: Conceptual model of how inputs, outputs, and outcomes of transit relate.

specific actions that should be considered when planning for transit services in national parks and adjacent communities.

4.2. External Factors

External factors should be expected to impact the number of people riding transit. Numerous events since 2000 (to be discussed later) would likely negatively influence park visitation, and thus the impact of transit on traffic, parking, circulation, and local economies has likely been muted in the early years of park transit systems that started operations at the turn of the millennium. A variety of factors influence changes in the tourism industry. At a fundamental level, tourism communities must accept the effects of such factors as weather and wildfires. Nearby tourism venues with big events might have minor or major impacts, and these events could compliment or compete with park attractions, depending on how tourists plan their time. The geographic location of a park can affect the length of its visitor season (Figure 4-2). Parks within a day's drive of cities might have a steady stream of weekend visitation throughout the year, as in the case of Hot Springs National Park, but many national parks get the majority of their visitors in the summertime. Northern parks, such as Denali and Acadia, have few summer months with passable roads, whereas southern parks might start their peak season earlier and end them later. The desert heat of Zion National Park with average summer temperatures of 95 to 107 degrees Fahrenheit (35 to 42 degrees Centigrade) can lower the volumes of visitors in months of high visitation peaks in cooler climates.

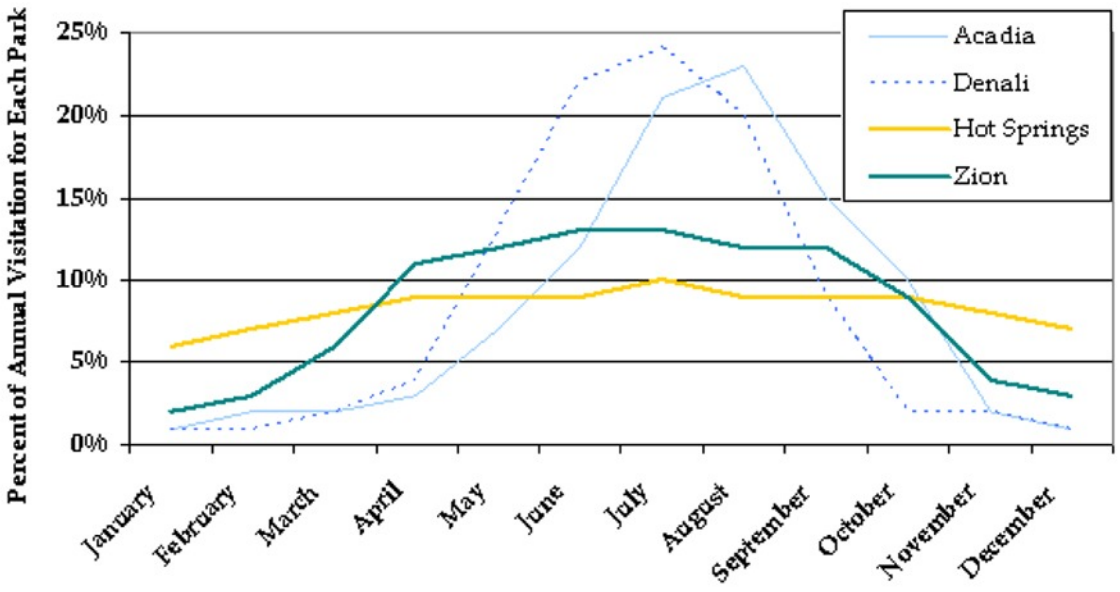


Figure 4-2: Some case study parks have higher seasonal peaks than others, as demonstrated in 2002 data.

The length of season and the height of peak season in terms of number of visitors both affect transit operations. Transit operates best where a large number of people want to move between a concentrated number of points, so the crowds of a high peak season can move efficiently on transit; however, a short season with a high peak means that a large number of drivers need to be hired for short term work. With a lower peak and a longer season, a smaller number of people need transportation over a longer period of time. A transit system in such a park would require a smaller number of seasonal drivers, but this park might have difficulties amassing enough riders to justify the cost of transit operations, particularly if the park has a large number of potential destinations for visitors; furthermore, parks with long visitor seasons might need to operate before

Memorial Day and after Labor Day, which might make it difficult to hire drivers, many of whom drive school buses when not working in park transportation.

4.2.1. Events Affecting National Tourism

Two important external factors affected the overall American tourism industry late in 2001: the economic recession and the terrorist attacks of September 11th. Industry experts cite differing influences on tourism since the attacks. People might have stayed home for fear of terrorism or to save money. On the other hand, some evidence suggests that some people spent less money on vacations by driving to parks not far from home. The September 11th terrorist attacks reduced international travel; therefore, foreign visitors to America's national parks have arrived in smaller numbers. Although foreign visitation to national parks is down, Americans are traveling domestically and identifying with national heritage. All parks noted a reduction in foreign visitors, but some stakeholders noted that American family reunions and driving tours increased because at a time of national security fears, people feel safe in the heritage of national parks.

New illnesses have also received national and international attention lately, affecting how much people want to travel and interact with unfamiliar people at vacation destinations. With the SARS flu-like virus killing people in Asia, parks on the Pacific coast reported a reduction in foreign visitors from Asia. Particularly with the long flight between Asian nations and the typically popular destination of America's west coast, Asian travelers were assumed to fear sitting in the close quarters of passenger planes. Many cruise ship destinations saw the effects of the Norwalk virus on tourism. This virus sickened large numbers of passengers at sea in recent years, making the vacationing public nervous about taking cruises. Because cruise ships operate under a competitive

private sector system, the operators do not readily provide data on passenger demand; however, communities around Acadia and Denali, which cater to cruise ship passengers, might have seen a decrease in passenger traffic due to fears of the virus.

Several of these external factors particularly affected demand for transit in parks and transit's subsequent impact on gateway communities. Many foreign travelers from European and Asian cities live in transit-friendly cultures, so these visitors easily adapt to park transit systems. A reduction in foreign tourists has meant a reduction in one of the audiences most immediately receptive to transit. SARS, particularly affecting travel from Asia, reduced a similarly transit-friendly demographic. The Norwalk virus specifically reduced cruise ship traffic to parks, and cruise ship passengers by definition arrive at national parks and gateway communities without private vehicles. At each destination, cruise ship passengers must evaluate anew how they want to travel around the area. In contrast, visitors arriving in private vehicles already have means to travel locally, making private vehicles the most immediately obvious mode to drivers.

4.2.2. National Parks Pass

From 1999 to 2000, the United States National Park Service launched or expanded transit systems in several parks across the nation; the year 2000 also brought the launch of the National Parks Pass, which allows visitors one year of unlimited entry to all parks in the national park system for a flat fee. The National Parks Pass came through Title VI of the National Parks Omnibus Management Act of 1998 (16 U.S.C. 5991 et seq.), and the National Park Foundation began the program on April 18, 2000. With parks now struggling to finance their new shuttle systems, park administrators speculate that the

National Parks Pass has reduced revenues at the entry gates of some key parks, but no conclusive data on National Parks Pass use exist.

Bryce Canyon and Zion National Parks attribute shortfalls in anticipated transit funds to the introduction of the National Parks Pass. In particular, Bryce Canyon reported that when the shuttle financing plan was established, 80 percent of the visitors paid park entrance fees. In 2002 (after the release of the National Parks Pass), only 36 percent of visitors paid fees directly to Bryce Canyon National Park. Bryce Canyon had based its transit finance plan on receiving a $10 transportation fee from 100 percent of visitor groups, but after the park learned that the public would not tolerate paying a transportation fee when presenting a National Parks Pass, transportation revenue diminished by two-thirds. For lack of financing, Bryce Canyon partially terminated its shuttle provider's contract and reduced shuttle service to a skeletal structure. Zion has had a less drastic experience, but where analysts had projected transportation fee revenue of $2.5 million based on 1999 visitation, the transportation account now falls short of contract by approximately $800,000 per year, and this money must come from other funding sources in the national park system.

National Parks Pass sales might occur in locations where several parks sit in a cluster and visitors travel from park to park on their vacations, and Bryce Canyon attributes its low rate of fare collection and its high rate of receiving visitors carrying passes to two primary factors. First, Bryce Canyon sits amidst a cluster of parks in a location where visitors coming from either Salt Lake City or Las Vegas will likely visit other parks en route to Bryce Canyon (Figure 4-3). Visitors would likely purchase a National Parks Pass at the first park they encounter and present passes at future parks. Second, most of

the parks in the region have expensive entrance fees ranging from $20 to $30 at the time of the site visit, when a National Parks Pass cost $50 to visit unlimited parks for a year. In this situation, the National Parks Pass could pay for itself after a visitor entered two parks, so buying the pass at the beginning of a park tour made sound financial sense from a visitor's standpoint.



Figure 4-3: Bryce Canyon sits in the midst of several parks, making a multi-park pass economical for visitors.

For park visitors, the value of a multi-park pass emerges when they are visiting several different parks once or multiple times in a year, but annual passes at an individual park are sufficient if a visitor wants to visit one park multiple times, and seven-day passes provide the most economical solution for people going to one park for a vacation once a

year. Acadia has felt no negative effects from the National Parks Pass because it sits in a location without a proliferation of other national parks (Figure 4-4). Acadia even benefits from the National Parks Pass because the park receives a portion of the national revenue collected from National Parks Pass sales at other parks. This portion can go to demonstration projects in the park, which means the money can fund short-term or capital projects with no lingering operations costs.

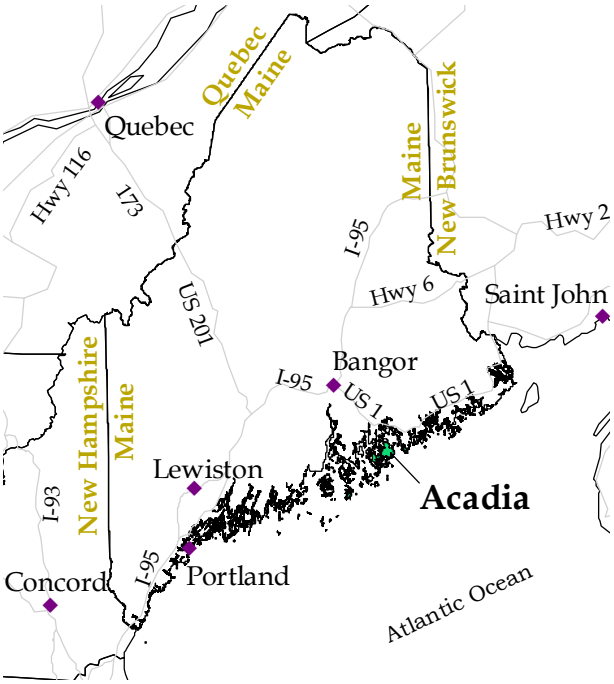


Figure 4-4: Acadia sits alone as a rural national park in the northeast, making multiple-park passes unnecessary for most visitors in the region.

Where the National Parks Pass has negatively affected transportation fee collection, local communities feel the distributive impacts. Businesses around Bryce Canyon at one time anticipated a full-scale transit system, but they soon found they could not predict the

level of service from year to year. Given that the buses carried a large number of passengers at the full scale, the reduced scale probably means that traffic congestion has risen with the diminishment of bus service, resulting in a compromised visitor experience. If Bryce Canyon gets a reputation for difficult traffic when other parks in the region have less congestion and even a renowned shuttle service, then fewer visitors might go to Bryce Canyon, and fewer visitors mean less opportunity for revenue in businesses catering to tourism in the gateway community.

Conversely, where the National Parks Pass has positively affected parks with an influx of demonstration project money beyond the money the park might have made with single park passes, gateway community businesses stand to receive economic benefit. Projects that improve park facilities can improve visitor experience and raise the reputation of a park as a vacation destination. As the reputation rises, the potential for a larger number of visitors and higher total visitor spending also rises. In effect, the National Parks Pass appears to have redistributed the economic potential of gateway community businesses from some parks to other parks.

The above external factors need to be incorporated into the observations and conclusions derived from this research.; however, even though these factors might have contributed to service outcomes, they likely did not greatly affect the inputs and outputs that surfaced from local planning and decision making. These inputs and outputs most likely reflect community-specific concepts of needs and desired service characteristics.

4.3. Planning and Decision-making Inputs

4.3.1. Goals and Objectives

Parks and gateway communities have various reasons for implementing transit services; however, this research found a number of the goals that remained consistent from park to park.

4.3.1.1. Traffic

Oftentimes, transit system organizers have sought an alternative to traffic congestion, parking problems, and the perception of crowding. Park shuttle systems are making strides in these areas.

- Before Zion National Park introduced its shuttle, 2,000 vehicles would vie for 300 parking spaces in the park on an average summer day.
- Bryce Canyon accommodated many of the same tourists visiting Zion, and park administration felt that visitors would find traffic problems at Bryce Canyon particularly disappointing after visiting Zion with its new state-of-the-practice shuttle system.
- Acadia saw a shuttle system as a way to avoid instituting a reservation system to limit the number of vehicles in the park.
- Cape Cod wanted to provide an alternative to gridlock in gateway communities and the national seashore.
- Denali started shuttle service to handle rising visitation just when private vehicle access to the park opened. The shuttle preemptively addressed anticipated traffic.
- Yosemite is looking for alternatives to closing its entrance gates because the park cannot accommodate the demand for private vehicle parking spaces.

- Hot Springs did not report traffic congestion in the park as a major motivation for trolley service.

Traffic congestion, parking problems, and crowding capture attention because they directly affect visitor experience; therefore, these problems easily motivate mitigation measures, such as shuttle systems.

4.3.1.2. Safety

Along with the goal of reducing traffic congestion comes the associated goal of increasing safety for visitors.

- When Zion replaced the 2,000 vehicles per day driven by tourists looking at scenery with bus drivers specifically trained with an eye toward safety and an awareness of pedestrians and bicyclists, bicycle use on the Canyon Road increased as a consequence.
- Denali National Park instituted its internal shuttle system at the time when the construction of the George Parks Highway between Fairbanks and Anchorage made private vehicle access to the park practical. The shuttle initiative started partially because the physical design of the road inside the park posed a safety hazard to high volumes of traffic. The road telescopes from a two-lane paved road to a two-lane dirt road to one and a half dirt lanes until it becomes only one unpaved lane with pullouts to allow vehicles to pass. Trained drivers of a limited number of buses have navigated the sometimes treacherous terrain with a strong safety record for three decades.
- The trolley at Hot Springs National Park has allowed people with oversized vehicles to travel up the mountain road without navigating switchback turns.

- Bryce Canyon, Cape Cod, and Acadia did not cite safety as a major motivation for instituting transit service.

On the other hand, a stakeholder in the Yosemite transit planning process raised the concern of disaster recovery: does the rural area around the park have sufficient emergency resources to handle the situation if a bus goes off the side of a mountain? Recovering a single passenger vehicle and airlifting a few injured occupants to a hospital is much more manageable than recovering a bus and large numbers of people needing emergency medical attention.

4.3.1.3. Environment

Environmental goals appeared in a number of case studies. Where demand for parking exceeds supply of designated spaces, visitors often create informal parking spaces along roadsides, which can damage sensitive ecosystems. In these instances, transit system organizers hope drivers will leave private vehicles in hotel parking lots instead of on roadside grasses. Noise pollution has also raised concerns in some parks.

- Zion National Park officials are trying to reduce the noise of diesel tour buses with a policy requiring bus drivers to turn off the engines of idling buses. Transit system organizers have discussed requiring tour passengers to ride the propane shuttle buses inside the park instead of the diesel tour buses.
- In Denali National Park, staff credits the willingness of wildlife to walk close to the road to the lack of traffic noise.

Perhaps as the most prevalent environmental motivation, air quality appears as an objective of many transit efforts.

- Although Acadia National Park sits downwind from the pollution centers of northeastern cities, reducing local production of air pollution around Acadia can help make a critical difference in visitor experience and local quality of life. In the first four years of service, analysts estimate the propane powered Island Explorer reduced island traffic by 300,000 vehicles and prevented 24 tons of nitrogen oxide and volatile organic compounds from entering the air (*58*).
- In contrast to Acadia's troubled air quality, Bryce Canyon has outstanding visibility on clear days, allowing some of the most expansive viewsheds in the nation. Alternative fuel transit vehicles in the region can help the park maintain this distinction.
- Yosemite National Park states air quality as a motivation for transit in and around the park, but critics of Yosemite's operations question if the park transit system efficiently addresses the objective of reducing vehicle emissions. The in-park transit system uses a fleet of 1986 diesel buses, and local residents report a permeating smell of diesel particulate pollutants in the Yosemite Valley on summer days. In contrast, the State of California has the nation's toughest emissions standards for private vehicles; therefore, private vehicles, which are usually much newer than 1986, have state-of-the-art technology to reduce emissions. Yosemite will replace its transit fleet in the near future, but plans called for the 1986 diesel buses because drivers need the power of these diesel engines to carry the weight of the buses up the steep terrain of the area.

Stakeholders at neither Hot Springs nor Cape Cod mentioned strong environmental factors contributing to the decision-making that led to transit service.

4.3.1.4. Other Goals

Some parks have other motivations for operating transit. Some aim to create partnerships in the local community by addressing transportation issues, which cross between parks and gateway communities. Others want to enhance visitor experience by providing services. Bryce Canyon saw the need to have compatible services at all parks in its region. Grand Canyon National Park has had shuttles for years, and Zion National Park was getting resources for a new transit system carrying almost all visitors to Zion Canyon. Given that many of Bryce Canyon's visitors arrive directly from a trip to Zion, Bryce Canyon officials anticipated complaints when people went from a hassle-free state-of-the-practice transit experience in Zion to traffic congestion and fights for parking in Bryce Canyon. Transit had to come on line at Bryce Canyon in the same year that the Zion Canyon Shuttle started, even though Zion received extensive federal resources, and Bryce Canyon had to work without external support.

Notably, some businesses have demonstrated that they support the goals of transit and might even be willing to absorb financial losses for the larger goals. One tour bus operator declared that after thirty years of business operations, he had seen a decline in his profit margin when the shuttle service started; however, he supports the shuttle as a necessary aspect of stewardship of the national park he serves. Not all business owners espouse such an altruistic attitude. A retailer outside Zion National Park expressed resentment at the way the shuttle affected the conduct of business in his town, despite the overwhelming support of neighboring businesses and residents. When weighing the goals of transit, the needs and attitudes of local stakeholders must come into account in the planning process.

4.3.2. Partnering

In statements of official policy, the National Park Service has identified and responded to the need to work in partnership with stakeholders involved in projects with external effects that cross park boundaries (*59*). Transit in parks falls in this category because of its obvious connection to communities when buses cross park boundaries. Less obvious manifestations of partnerships, such as joint financing schemes and contributions of space for parking, can have an even more profound impact on the development of shuttle service. The Volpe National Transportation Systems Center in the U.S. Department of Transportation has documented the contributions of partnerships in launching shuttle service (*60*).

As a key part of data collection, this research effort included interviews with key stakeholders representing a variety of interests and backgrounds (Table 3-12). These stakeholders, who hold both formal and informal positions for representing various groups, reflected the partners who should have held, and most often did hold, influential roles in decision-making for case-study shuttle services. The interviewees often participated heavily in the partnerships that brought transit to the streets.

Case studies showed that park superintendents largely defined the degree of park management interaction with gateway communities.

- Community leaders outside Cape Cod and Yosemite commented on the newfound respect they had for current administrations in their parks. Prior management in Yosemite had drive to accomplish established goals, which sometimes came at the expense of community relations. The current superintendents in both parks have

demonstrated commitment to interacting in two-way communication with gateway communities.

- Stakeholders outside Acadia chuckled as they expressed their frustration that "superintendents come here to retire," which left the impression with the locals that administrations with their associated goals last for two years at a time.
- Cape Cod stakeholders expressed their pleasure that they have kept their existing superintendent for eight years.
- The new superintendent of Bryce Canyon inherited the financial dilemmas of the Bryce Canyon Shuttle because the previous superintendent had, in the words of one local interviewee, "fallen on his sword" by using an early retirement to take ultimate responsibility for the culmination of several factors that damaged the financial plan of the system and resulted in Bryce Canyon defaulting on its contract with the transit operator. The National Park Service appears to have selected the new superintendent for Bryce Canyon based on skills for handling such a situation and interacting well with the stakeholders affected by transit.

Although a superintendent shapes much of an administration's demeanor toward gateway communities, a few of the case studies showed that other park officials can offer the dedication and human resources necessary for establishing true and solid partnerships.

- At Zion and Acadia, deputy superintendents hold the lynchpin positions for interacting with all types of stakeholders and knowing the full history and status of shuttle initiatives.

- The chief ranger of Bryce Canyon National Park and the facility manager of Cape Cod National Seashore command the most intimate park management knowledge of shuttle system history and operations.
- At Denali, where the concessioner provides shuttle service, concession liaisons on the management staff handle daily details.

Although some of these positions do not hold figurehead status, people in these positions have effectively coordinated with a full range of stakeholders and provided continuity over the years to supply stable management support for operations.

Acadia and Zion have appeared in numerous publications as role models for partnering (*61*,*62*). Through partnerships, transit system organizers have gained local input on service design, public support, and financial contributions. Interviewees in the case study for Cape Cod also emphasized the strength of partnerships surrounding the Provincetown-Truro Shuttle. Local stakeholders understand that Cape Cod National Seashore can most easily contribute capital for purchasing buses, whereas the Seashore turns to local communities for their abilities to provide a revenue stream for covering operating costs. Defining needs and understanding what contributions each partner can make helps these partnerships pull together all of the pieces necessary to create a seamless service appealing to visitors.

While successes of the partnering efforts have received attention, it is also important to notice the effect on transit service and public reception of transit where partnering has not taken hold. Not all case studies revealed exemplary partnership situations.

- The local leaders interviewed in the Hot Springs National Park case study all describe a congenial relationship between different agencies with one-way

communication. Each government agency says that it keeps other agencies informed of its actions by reporting on what it has done, but few ask for the input or participation of the others. Far short of supporting the City's trolley system serving the park, Hot Springs charged its gateway community tour bus fees for the privilege of taking the bus onto park lands for years. Park administration held the attitude that if the trolley charged a one-dollar fare, then the City must make money on the service akin to a tour bus operator, even though the service required public subsidy and provided a public service of mobility for transit-dependent populations and tourists with oversize vehicles that could not navigate switchbacks up the mountain. On the City's side, the change of route to serve Magic Springs went through the Transportation Advisory Committee, boards, and councils in the City, but no one ever talked to the National Park Service. All of the leaders respect and speak well of each other, but the interactions never involve two-way dialogs with participation in projects of mutual interest, such as transit.

- Stakeholders around Yosemite do not even describe congenial one-way communication. Whereas the Friends of Acadia has provided a grant for an experiment to eliminate fares on the Island Explorer and nurtured a one-million dollar donation dedicated to transit in Acadia, the Friends of Yosemite is litigating planning documents for the park out of mistrust for the management of the park and its goals. YARTS began as a five-county partnership and ended as a three-county partnership with limited resources. Harsh feelings, contention, and mistrust now cross county lines, although some of the counties have pulled together behind the transit service. Even so, the YARTS transit planning process

has had long-standing problems with communication and true inclusive participation. Stakeholders express a general sense of improving communication now, particularly with the new superintendent and his personal orientation toward interacting with the community. Bryce Canyon created its system in isolation without any national resources anticipated. Neglected as Zion received resources, Bryce Canyon initially took pride in its independence for creating a plan for sustaining transit locally; however, when unanticipated difficulties and expenses started arising, as all case study locations reported had happened, the strength of independence transformed into the weakness of a lack of support network to disperse the impact of the problems across a web of partners.

The transit systems in all of these locations continue to deal with a legacy of limited resources and a lack of support from crucial sectors.

Notably, parks and gateway communities boasting interactive stakeholder processes and strong partnerships also boast high ridership and highly-regarded transit systems.

- Acadia's Island Explorer is expanding at a rate faster than the original system planners ever anticipated.
- Zion has received national acclaim for its shuttle service.
- Several communities on Cape Cod are now discussing ways to expand the Provincetown-Truro shuttle, which grew to the most heavily ridden transit route on the Cape soon after its inception, to reach more communities and facilitate economic growth through tourism.

The systems noted here that did not have such strong partnering supporting them all noted problems.

- Bryce Canyon defaulted on its transit contract because the budget did not weather unanticipated shocks to the plan. Despite the Bryce Canyon Shuttle's distinction of the highest ridership compared to visitation among voluntary systems in these case studies, a new agreement with the transit operator cut service to 35 percent its original size.
- In Hot Springs, local leaders view the trolley as an amenity, but no one considers it a major asset to the city or a notable draw for visitors.
- At both Hot Springs and Yosemite, transit operators talk of success in attracting a core ridership, but neither system has achieved the levels of fame and acclaim earned at Acadia and Zion.

The degree of true partnering between parks and community leaders of the full range of stakeholder interests does appear to have a determining role in the extent of acceptance of shuttle systems among local residents and visitors, which in turn affects the ultimate success of shuttle systems in attracting ridership and achieving the goals established for transit service and their associated impacts.

4.3.3. Finance

The finance of transit systems affects all stakeholders involved. The extent of financing that is available determines the extent to which transit systems meet ridership demand and reach the destinations and businesses that need to be served. Financing also determines the presence of the systems in the eyes of potential users. The process of finding and allocating finances in a world of limited resources largely determines which impacts will be felt most strongly and which objectives receive highest priority.

4.3.3.1. Funding

Most park transit system organizers must look to a number of different funding sources to cover costs. The typical funding structure used to provide transit in cities does not work in the case of parks because the federal government allocates transportation dollars according to population sizes. A town the size of Springdale, Utah, outside Zion National Park (population 391) cannot obtain the same financial resources as a metropolitan city of 50,000, even though Springdale handles 2.5 million visitors annually. While Congress is now reviewing proposals for funding transit in parks, existing systems must creatively acquire funding through multiple sources.

4.3.3.2. Fare Revenue

Fares alone cannot support transit. The U.S. Federal Transit Administration recommends planning on fareboxes recovering only 38 to 43 percent of the operating costs of transit (*63*). In rural areas, the transit operators typically recover a smaller proportion. Any discussion of transit finance must begin with an underlying understanding that transit service requires subsidy, and money spent on subsidy purchases a degree of performance against established goals, such as maintaining less than a two-percent increase in traffic volumes on Mount Desert Island's most congested roads outside Acadia, achieving a certain percentage reduction in auto emissions to improve air quality, reducing the number of registered complaints about parking availability, or raising the number of wildlife sightings near park roads.

Even if the fare box cannot solely support transit, passenger fares can help reduce the amount of subsidy needed, although this offsetting could result in a reduction of the impact of transit. Transportation research has shown over the years that people notice

out-of-pocket costs more than they notice hidden costs (*64*), so out-of-pocket fares deter people from riding the bus, particularly where parking is offered for free.

- From the start of service, transit system organizers in Zion and Bryce Canyon committed themselves to offering fare-free service.
- Ridership data for the Island Explorer serving Acadia showed this ridership elasticity to transit fares. In 1997, a philanthropic grant allowed the transit operator to eliminate the two-dollar fare, and ridership rose 600 percent from roughly 2,000 riders in 1996 to 12,000 riders in 1997 (*71*). Based on this reaction, stakeholders in the Island Explorer grew committed to providing fare-free service.
- Hot Springs stakeholders reported making a similar finding. The trolley serving the park had low ridership when it charged a one-dollar fare, and the City of Hot Springs realized it did not recover much money out of the fare box. The City removed the fare and found that ridership increased when the service became free to ride.

Yosemite's YARTS has inadvertently demonstrated two similar points. First, whereas people notice out-of-pocket expenses, people do not notice hidden expenses. YARTS runs routes of 80 miles (129 km), which means that riding the bus saves people the cost of mileage on their private vehicles. A round-trip ticket on the bus from Merced to Yosemite costs $20, whereas roundtrip mileage corresponds at the federal government rate of reimbursement for mileage ($0.365/mile in 2002 and $0.375/mile in 2004) to a 2004 trip cost of $60 plus a $20 total entrance fee for as many people as a car carries. Many stakeholders in the local area complain about the expense of fares for the system,

but few recognize the comparable cost of private vehicle transportation because those costs do not come directly from people's pockets on the day of the trip. Transportation research has shown that parking fees (out-of-pocket) provide a highly effective deterrent to private vehicle travel (*65*), but rural communities and parks rarely have parking fees. Second, charging fares to people who have grown accustomed to riding for free can cause a sharp drop in ridership. Commuter passes had been offered for free to employees of the National Park Service and its concessioner for the first few years, but the concessioner employees lost this privilege after the 2001 season. In the following summer, commuter ridership dropped by 24 percent.

Transit system organizers have found an important argument supporting collecting fares: getting people used to paying fares now will avoid a shock to the riding public and dissention if fares need to be introduced later.

- A one-way ride on the Provincetown-Truro Shuttle on Cape Cod costs one dollar, and that money helps Cape Cod achieve local funds to meet the matching funds required to receive federal transit money. Transit system organizers for that shuttle are also using this low introductory fare to condition people early in the service to the idea of fares.
- Denali experienced this problem when it introduced fares after decades of fare-free service. The local population now considers passage into the park expensive at $33.75 in 2003 for a round trip to the innermost point on the transit route.

4.3.3.3. Entrance Fees and Transportation Fees

A primary source of revenue for many national parks comes from entrance fees collected from visitors. Entrance fees for case study parks ranged from five dollars for an

individual visiting Denali to $20 per private vehicle entering Yosemite. Common to most parks in the study (with Denali and Hot Springs as exceptions), confusion still exists over how to handle the difference between traditional entrance fees paid for a group of an unspecified number of people arriving in a car versus an individual or group riding a shuttle bus together. Many people interviewed saw fares and entrance fees paid by the bus seat as a deterrent to families. Notably, fares and entrance fees come directly out of visitors' pockets, so people pay close attention to them.

Collecting entrance fees from shuttle riders has taken various forms in the parks.

- Acadia has long held a local reputation for failing to collect entrance fees because the porous structure of the park intermingling with local communities makes it impossible to put a fee collection station at every park entrance. With the advent of the shuttle, a policy to encourage ridership says no one will check passengers for entrance fee receipts, and ridership surveys show that only 42 percent of riders paid for their visits in 2001 (*82*). Acadia is now trying a public education campaign to encourage people to pay their dues.
- Yosemite now charges no entrance fee to YARTS riders, who already pay a noticeable individual fare between three and twenty dollars for a round trip; future riders will potentially pay a one-dollar entrance fee in addition to their fares.
- Denali has only a five-dollar entrance fee, and the concessioner collects most park entrance fees in combination with bus fares because most people access the park by bus. Someone who already carries an entrance pass must ask to have the park entrance fee deducted from the price quoted for a bus reservation into the park.
- Hot Springs charges no entrance fees to its visitors.

With the advent of shuttle service in several parks, park administrators have looked for creative ways to finance the systems, and Utah's Congressional delegation requested legislation to allow collection of a transportation fee. Park entrance fees formerly cost $10 per vehicle or group of visitors; parks kept 80 percent and sent 20 percent to the National Park Service in Washington, D.C. Special legislation (public law 102.03) allowed parks to add a transportation fee on top of an entrance fee, and the parks could keep 100 percent of the transportation fee to pay for the shuttle. The transportation fee comes from every visitor paying for entry to the park, regardless of what mode of transportation the visitor is using. With a $10 entrance fee and a $10 transportation fee, parks would thus keep $18 for every $20 paid by visitors at the entrance gate. From the start of service, Bryce Canyon structured its shuttle financing on transportation fees. Based on 1999 visitation, transportation fees would allow Zion would have $2.5 million per year to pay for transit operations. Acadia set a start date for transportation fees for May of 2004 to help finance its already operating system. Similarly, Cape Cod planned a later introduction to fund its tram service. Yosemite has decided not to institute a transportation fee because entry to the park already costs $20.

Bryce Canyon based its shuttle funding structure under the theory that all groups entering the park, including people presenting national passes, would pay a transportation fee. When the shuttle service started to roll, the Park collected transportation fees for one day before the complaints from visitors grew so overwhelming that the practice had to be abandoned. This experience showed that the public will only tolerate collection of transportation fees in conjunction with the collection of an entrance fee.

4.3.3.4. Local Contributions

Just as most transit programs in America require a local match for federal funds paying for transit, shuttles serving national parks typically require contribution from gateway communities; however, this contribution has taken a different form in each of the case study parks.

- Acadia's Island Explorer receives income directly from businesses as fees for having a stop at the front door; local communities also contribute through local taxes, and Bar Harbor, Maine is considering instituting parking charges on municipal lots as means to generate local transportation funds from the visiting tourists. Acadia also contributes money from its entrance fees to reach a local match for federal funds.
- Denali local lodges assume all of the costs of providing their own equipment and shuttle service into the park, and people who do not stay at lodges offering service have no means of taking the bus.
- Hot Springs, Cape Cod, and Yosemite all receive transit service from gateway communities where the local governments cover the entire operational subsidy needed beyond fare revenue, and the trolley in Hot Springs has no fare.
- For Yosemite, making the local contribution worries one of the counties that dropped out of the YARTS partnership: Tuolumne County says that if it demonstrates a need for transit in order to receive transit funding and YARTS fails, the county will lose eligibility for some road improvement money until it provides transit service.
- The tax base of the small town of 400 residents outside Zion cannot afford to make any substantial contribution to the shuttle service used to transport over two

million riders per year, but the State of Utah provided infrastructure money to support service outside the national park.

- A large local business outside Bryce Canyon provided funding for a demonstration shuttle, as well as pavement reinforcement to support the shuttle; however, the population outside Bryce Canyon largely sits in the same position as the population outside Zion. The small towns surrounding the park could not afford a tax base appreciable enough to contribute substantially to the shuttle.

These different schemes for revenue generation show that financing for shuttle systems in parks and gateway communities typically creates a negative economic impact on the local communities. Different systems distribute the burden of the financing in different ways. The case study parks used three major sources: park entrance fees, local tax base, and financial responsibility assumed by local businesses.

The unique schemes for providing local contribution offer a mixed blessing for gateway communities. For starting up new systems, communities could find the independent approaches intimidating. With no prescribed plan, guidelines, or requirements, partners in a local transit planning process could find difficulty identifying proper expectations for contributions and reasonable levels of local match. After overcoming the initial stages of uncertainty, however, the flexibility for forming the local component means that parks and gateway communities can tailor the financing to the structure that best fits local needs.

4.3.3.5. Philanthropy

The National Park Service has a long legacy of philanthropy supporting its mission. Acadia National Park grew out of lands donated by the private sector, and John D.

Rockefeller, Jr. built and donated the park's signature carriage roads and stone masonry bridges. Private capital first built the Tioga Road through Yosemite National Park. Now, this tradition of philanthropic donation to parks, particularly to park transportation, is continuing with transit initiatives.

In close partnership with the Island Explorer, the Friends of Acadia has made the greatest strides toward finding ways to fund its transit system through large donations from corporate sponsors and in small donations from the general population. This nonprofit arranged a one million dollar gift from L.L. Bean dedicated to funding the transit program, creating a new model for partial transit finance. Nonprofit groups can actively pursue private contributions for supporting capital expenses and even for ongoing revenue streams to cover operating costs. Beyond such major donation, this Friends group has provided a donation mechanism for the general population. While local stakeholders strongly support fare-free transit, several transit riders in the early years of operation asked how they could make donations to the system, so the transit operator installed donation boxes on buses and requested two-dollar donations.

The natural history associations at Bryce Canyon and Zion, which cannot contribute to transit operations by the nature of their charters, have looked into the feasibility of forming a new joint nonprofit group: the Zion Bryce Foundation. This group can help find and manage corporate sponsorships dedicated to maintaining and improving transit service in the parks. In consultation with the local natural history associations, the National Park Foundation has explained that after formation, a new nonprofit typically needs three to five years to facilitate contributions.

The Yosemite case study showed a different effect from nonprofit involvement. Again, transit has not received unanimous support in the local area. The problems stemmed from the National Park Service's adoption of the controversial Yosemite Valley Plan and Merced River Plan. As opposed to generating philanthropic donations to support transit serving the park, the Friends of Yosemite is currently suing the National Park Service over the Merced River Plan.

Stakeholders at Cape Cod, Denali, and Hot Springs reported no philanthropic impacts on transit service. The Friends of Hot Springs recently renovated a promenade above Bath House Row, but the nonprofit group indicated no plans to extend its efforts for pedestrian access to include transit access.

4.3.4. Costs

Several people in case study locations who contributed to this research commented on how the high cost of providing transit surprised them. In some cases, they found transit required more capital for startup than anticipated. In most cases, parks that managed to begin their transit service still did not know how they were going to maintain a funding stream to cover operating and replacement capital costs on a permanent basis.

4.3.4.1.Capital

Capital investment directly affects the tangible presence of transit systems and the image portrayed to the public. Capital budgets determine how many buses are available for operations, so a small budget can limit the frequency of bus departures, as well shuttle amenities. Infrastructure capital determines the physical presence of transit systems on the roadside, as well as the physical comfort of passengers waiting for a bus.

Infrastructure allocations have varied widely from park to park.

- For the start of shuttle service, Zion built a visitor center, a 400-car park-and-ride lot, bus shelters, and other amenities inside the park. The State of Utah simultaneously contributed money to build bus shelters and pullouts in the gateway community, as well as to chip seal the town's main street with a reddish-purple coat to bring the desert feel of the park into the town. No other park shuttle system revealed equivalent coordination and investment in infrastructure.
- Acadia set up a plan for phased infrastructure inside the park, such that bus shelters existed at three locations in the park at the time of the case study site visit (after the third year of shuttle service), but other fixed bus stops identified by small signs often lacked basic infrastructure, such as wheelchair ramps and wide sidewalk space.
- Bryce Canyon built bus shelters and benches in the most heavily visited parts of the park, leaving other areas served by the shuttle without infrastructure. The strategy proved fortuitous because when shuttle service shrank due to lack of operating money, the one remaining route had a full complement of bus shelters, and no bus shelters confused visitors by standing vacant on discontinued routes.
- Denali built large-scale infrastructure at major viewpoints and an internal visitor center, but most of the park road remains unaltered by further development, just as the park has few designated and improved trails. Denali is now constructing a new visitor center at the park entrance, which will leave the existing facility to its original purpose as a transportation center.
- Cape Cod National Seashore provided capital money to provide buses for the Provincetown-Truro Shuttle, expecting communities to provide operational funds.

- Both the trolley at Hot Springs and YARTS at Yosemite received little more than simple signs to identify transit stops. These systems complement other transit systems, which share some existing infrastructure.

While federal money pays for fixed infrastructure inside parks, fixed infrastructure for shuttle routes reaching outside the parks receives money from different sources.

- For Zion, state money provided infrastructure and road improvements.
- Outside Acadia, state and local government devoted money to developing the village green as the hub for all shuttle operations. Beyond the hub, the gateway community has generally little more than a small sign distinguishing fixed stops.
- Some private businesses outside Acadia and Bryce Canyon have spent thousands of dollars for improvements that would generally fall into the category of public right-of-way improvements, such as reinforced asphalt on the highway to handle the weight of shuttle buses and pullouts to allow free-flowing traffic while passengers board and disembark in the safety of dedicated space.
- Outside Cape Cod, no infrastructure appears along the Provincetown-Truro route, but with no fixed stops along the route, no infrastructure would be expected.
- Stops in gateway communities outside Yosemite have only small signs to indicate bus stops.
- The bus system for Denali currently only runs inside the park. Lodges operating private shuttles that take visitors into the park do not have jurisdiction to build infrastructure off of their own private property.

As a general rule, the gateway communities with no strategic plan for constructing infrastructure end up with little or no infrastructure to establish the presence of the shuttle

and improve visitor experience, and the infrastructure that does appear has little consistency from stop to stop.

Beyond the basic fixed infrastructure of bus shelters, other capital costs remain outstanding issues in almost all of the parks. In particular, the replacement of rolling stock remains an open question in the minds of many stakeholders of these transit systems. Typical transit buses run on the road for roughly five years, which means that many of the new transit systems will need to consider phasing in replacement equipment as early as 2004 or 2005. With each bus costing a few hundred thousand dollars, fleet replacement requires substantial financial dedication. Also, now that Acadia has enjoyed the benefits of a $2 million field operational test of intelligent transportation systems, other parks considering enhancing their transportation systems with the technology will need to find new sources of capital to pay for the installation of this equipment that has proven effective in visitor surveys.

4.3.4.2. Operating

After the costs of startup for shuttle service, transit requires a longstanding commitment to continuous subsidy for operations. No transit system in America supports itself financially, so local governments work with the federal government to provide a funding stream. The National Park Service finds itself trying to offer transit service in the unique context of federal lands, where government transit policy does not currently provide a finance structure for transit moving between federal and local lands. Complicating the dilemma, the United States allocates transit money according to resident population, but gateway communities often need to provide service for tourism populations out of scale with the size of local resident population, as in the case of

Springdale, Utah (population 400) welcoming 2.5 million visitors to Zion National Park. Congress is considering several bills to sponsor transit in parks for the future, but parks with existing transit systems must now find ways to sustain service inherently impossible to support at the local level. Current financing schemes involve localities, businesses, and government at all levels.

In the case studies, most parks and gateway communities had no plan for sustaining their transit systems beyond the initial years of operation.

- In the worst case scenario, Bryce Canyon had to make a partial termination of its contract with its shuttle operator because in the earliest years of service, park funds could not provide sufficient money to cover operating costs. Closing the gates on the parking area constructed to serve the shuttle reduced operating costs by eliminating a half mile drive to the parking area, even though contracts still required paying $300,000 for the unused parking.
- In a less drastic (yet still troublesome) case, revenue earmarked for transit at Zion falls a mere $800,000 short of operating costs, so the National Park Service, an agency with a substantial backlog of financial needs, must provide an annual subsidy.
- Yosemite, Cape Cod, and Hot Springs all depend entirely on gateway communities for operating revenue and long-term system sustainability.

Some of the operating costs of transit have taken parks by surprise. Zion realized that the weight of its shuttle buses puts more stress on park roads than multiple passenger vehicles do, so the shuttle requires an accelerated schedule of road maintenance. Denali maintained federal wage rates for over two decades before deciding that it needed to

streamline its cost structure. When the shuttle went to private service offered through a concessioner contract, the wage rate fell, resulting in driver discontent and the eventual emergence of a union.

Partners involved in Acadia's shuttle system have focused efforts on developing a sustainable strategy for shuttle subsidy, and this strategy can serve as a model for other parks. Corporations have made major donations, and local communities have voted to support the shuttle system with local tax money. Local tax bases contributing to the shuttle both provide financial backing and show that local residents and businesses support the system. Outside Acadia, Bar Harbor's proposed parking fee program might also bring revenue to improve local transportation; this proposal came from a task force formed to examine means of further local revenue generation. Just as Acadia's Island Explorer stands as a model for partnering, the partnerships formed have formed a model scenario for amassing a funding stream to sustain transit. Notably, such a system would not be viable in Springdale, where the smaller population could not likely generate substantive financial support. Also, while other shuttle system organizers can learn from this model, Acadia itself still has work to do. Acadia needs to tighten its revenue collection for park entrance fees to uphold its end in the financial partnerships supporting the shuttle and the park.

Parks considering transit need to recognize early in the planning process the challenges of providing a constant source of funding. Without the dedicated funding structure enjoyed by major metropolitan areas, partnerships between governments and gateway communities provide the necessary foundation for transit funding. Probably without coincidence, transit systems that have the strongest partnerships behind them

have typically found financial means to support partner priorities. These means usually require contribution from the partnering groups.

- For instance, Provincetown outside Cape Cod National Seashore has lost roughly $30,000 annually in municipal parking revenue since the shuttle started, but Provincetown considers that economic impact worthwhile for the benefits gained from the shuttle.
- Outside Denali, businesses assume the full cost of operating shuttles between the park and places where visitors can stay the night. These shuttle systems have strong ridership and local support.
- In contrast, Hot Springs charged its gateway community for trolley entry the same fee it charges tour companies, even though the one-dollar fare could not come close to making the service profitable. In this case, the national park as a partner created a financial burden on the shuttle operator.
- Around Yosemite, one of the two counties that dropped out of the five-county partnership cited an imbalance of service allocation to other counties in disproportion to the support (financial and otherwise) requested from all counties. In losing two county partners, YARTS also lost the financial support of those counties that could have helped shuttle service develop. In both of these cases, partners might have focused on individual gains, rather than collective benefits, and fighting each other for individual benefits resulted in fewer benefits for everyone involved.
- Small communities outside Bryce Canyon and Zion cannot generate sufficient funding to act as strong financial partners for transit.

Without an established mechanism for funding transit, parks and gateway communities have had to jump into service without a clear idea of how they will sustain operational subsidy. Even with this uncertainty, most stakeholders expressed commitment to making the systems work in the long haul. For example, the transit operator in Bryce Canyon accepted a renegotiated contract after finances required termination of the original agreement, demonstrating that the transit company believes the concept of transit will take hold in the long run. The intelligent transportation system YATI outside Yosemite shows the counter-example: expensive electronic equipment stands dark on the roadsides because local agencies have not demonstrated a belief in and commitment to the benefits of transportation technology. Partnerships for transit require long-term commitment, compromise, and economic outlay from gateway community governments, residents, businesses and/or other entities. With this commitment, partners can realize the goals and benefits of a well-utilized transit system.

4.3.4.3. Interaction of Capital and Operating Spending

The National Park Service appears to have an easier time providing capital funding than operating funding… probably because operating funding implies a long-term commitment, which is difficult for a federal agency to make when national priorities can quickly shift between environmental preservation and national security, depending on the priorities of administrations and current events. Another reason for the leaning toward capital funding comes from internal budget structures. With the newness of the National Parks Pass program, The National Park Service distributes money generated through the pass program as demonstration project money. Parks cannot allocate demonstration project money for ongoing expenses because the pass program has not established its

permanence. In essence, the National Parks Pass has generated a source for capital project funding; however, the revenue it generates replaces the revenue parks once received for entrance fees, and entrance fees provided parks with their operating budgets. The National Parks Pass has in effect circuitously re-categorized some money from operating budgets to capital budgets just at a time when national parks have assumed the financial responsibility of operating transit.

The leaning toward capital budgets appeared some of the case studies.

- Cape Cod National Seashore provided the buses for the Provincetown-Truro Shuttle, while asking the towns to support operations.
- Zion has acquired a substantial fleet of propane buses, built a propane fueling station and a visitor center, and erected bus shelters throughout the park, yet the Zion Canyon Shuttle falls $800,000 short of its $2.5 million operating contract's annual obligations.

A lack of dedication to creating a strong operating budget can quickly turn into a more expensive line item in a capital budget. Taking the Zion roadway deterioration as an example, a healthy operating budget for roadway maintenance strengthened according to the new demands of the heavy shuttles can address potential problems before they become repair issues; however, the accelerated wear of the roadway coupled with poor maintenance will only take a few years to become an expensive matter of reconstruction, rather than maintenance. Maintenance money appearing in an annual operating budget costs American taxpayers less money over time than reconstruction requirements appearing periodically in a capital improvement budget.

Overall, transit in parks requires a balance of capital and operating money. The Island Explorer at Acadia with its strong stream of money for operations needs to dedicate capital money to provide infrastructure throughout the shuttle system. Zion and Bryce Canyon need to find resources to sustain current operations now that the existing route structures have well-developed infrastructure and transit operators have sufficient rolling stock.

4.4. Services and Strategies as Outputs

4.4.1. Service Scope at Startup

What is the right scope of service for a new transit system? The results of these case studies do not offer a simple answer to this question.

- The Zion Canyon Shuttle started its first season anticipating private vehicle restrictions and two million passengers. The transit operator reallocated resources from the town shuttle to the park shuttle as a startup adjustment, but the shuttle worked smoothly from the start.
- Denali similarly restricted private vehicles and essentially moved all visitor traffic to transit in one season, but Denali did not face the same scale of operation that Zion had managed. After Alaska opened the highway between Anchorage and Fairbanks in 1971, the Denali transit system only needed to handle 88,625 visitors in 1972. Visitation grew to 251,105 in 1979.
- At Bryce Canyon, the shuttle started with a voluntary system that attracted strong ridership, but park administration, which financially defaulted on its contract with

the transit operator, speculates that transit system organizers should have started with a smaller system.

- The Island Explorer serving Acadia National Park started with full coverage of Mount Desert Island, yet in the first year, ridership quadrupled expectations (between 2,000 and 3,000 daily riders served versus the expected 700 riders per day), and demand for the shuttle exceeded capacity, resulting in visitor complaints of overcrowding before the second year brought a planned fleet expansion (*66*). In 2003, demand again exceeded the already expanded capacity, such that system operators are arranging to buy more buses.
- The Provincetown-Truro shuttle on Cape Cod similarly experiences many instances when demand exceeds capacity; however, difficulties in hiring and retaining drivers in the expensive local environment limit the system.
- Local support for the Hot Springs trolley relates more to the historic character its presence brings than to its capacity to move visitors; therefore, it has never required a substantial capacity.
- In the case of YARTS serving Yosemite, locals perceive empty buses except at peak times of day, so stakeholders could argue to keep resources low; on the other hand, the infrequent service could be deterring people from using the bus. Furthermore, two counties pulled out of the five-county partnership of YARTS in part because they felt they would not receive a fair share of service coverage, putting businesses in those counties at an economic disadvantage to businesses along the routes in counties receiving the focus of transit service. Greater service

coverage at startup in terms of routes and frequency might have helped to preserve the partnership, but the larger coverage would have cost more to operate.

4.4.2. Capacity

Several park transit systems have encountered recurring problems supplying enough bus capacity to satisfy demand. Tourism communities naturally need to accommodate peaks and lulls in visitation and demand for visitor services. Peaks in the number of visitors in a recreational area come seasonally and with events. Parks near major metropolitan areas often experience larger crowds on weekends, although more remote parks have less variability in visitation between weekends and weekdays. Daily peaks in travel activity occur around meal times and events, and the setting of the sun means most hikers come off of trails in the afternoon. Unique to transit riders in recreational communities where people have limited familiarity with the area, peak activity magnifies demands on transit personnel because a large percentage of the people getting on the bus have questions for the driver ranging from confirmation the of route destination to inquiries regarding the best park sites to see.

These heavy peaks for recreational transit have implications on service provision and the ability to meet visitor demand.

- At Cape Cod National Seashore, demand for the Provincetown-Truro Shuttle exceeds crush load often, particularly for events like fireworks on the Fourth of July. Congested roads and buses loaded to capacity lead to late arrivals.
- When demand exceeds capacity for the YARTS shuttle at Yosemite National Park, drivers deny boarding to people waiting for the bus because buses on the winding mountain roads cannot safely accommodate standees.

- Demand for Acadia's Island Explorer regularly exceeded capacity in the shuttle's first year of operation, but a fleet expansion allowed smoother operations the following year. In 2003, demand once again exceeded service capacity, spurring new plans for shuttle capacity expansion. High bicycle use in that park has made bicycle capacity and the availability of bicycle racks outside the buses a unique limiting factor because large numbers of people want to transport their bicycles at peak times, overwhelming the capacity for buses to carry bicycles.
- The Zion Canyon Shuttle responded to heavy demand in the park by reallocating buses from the town route to the park route in the first year of operation. This shift allowed frequent headways of as little as six minutes for the tandem buses and trailers in the park, while riders in the town could still expect four buses every hour.
- Bryce Canyon's transit system organizers had to prioritize financial limitations over visitor demand. Even though buses in the park faced heavy demand, the operator cut service capacity because the Park Service could not afford to pay for the originally designed capacity.
- Denali National Park has taken a unique approach to balancing visitor demand with protection of natural resources and visitor experience: administrators both implemented private vehicle restrictions and capped the number of vehicles (including shuttle buses) that can travel the park's artery road. Other parks have also considered creating such vehicle caps. Demand at Denali has not yet exceeded the cap, so no one has yet tested the policy. With growing

demand, stakeholders in the park are considering alternatives for capacity expansion, such as changing the allotments of vehicle trips (fewer trips allocated to professional photographers to allow more trips by transit) or adding new access roads from the north or the south. Park administration had set the cap in the 1986 general management plan against a projected increase above annual visitation at the time. In theory, a cap establishes a threshold of supply: the upper bound of use the park can withstand while reasonably protecting the natural resource and the visitor experience. In practice, the cap was set according to demand at a given time period.

- Capacity limitations have not created problems at Hot Springs.

In a recent movement, the National Park Service has started trying to determine the carrying capacity of parks in terms of impact on the natural resource and on visitor experience. This worthy effort poses a difficult challenge to pinpoint a threshold for a largely qualitative judgment, but Acadia and other national parks have recently spearheaded work in this area (*67*).

4.4.3. Effect of Frequency

Although transit systems in parks and gateway communities are generally designed to serve people on vacation, vacationers often feel sensitivity to time. People have to arrive in time for shows, dinner reservations, and the departure of a ferry or airplane. No one wants to spend a vacation worried about missing the bus or waiting at a bus stop. The Yosemite Area Regional Transit System (YARTS) runs every two hours and twenty minutes, and because the buses run on twisting mountain roads, the drivers do not allow people to stand in the aisle. If the bus is full on peak runs heading out of the park,

passengers receive instructions to wait another two hours and twenty minutes to take the next bus.

Research and experience with transit has shown that the long wait times, as at Yosemite, act as a strong deterrent to riding transit. When deciding how to travel, potential transit passengers consider compare both the time spent waiting at a bus stop and the travel time accessing or riding the bus to travel time by car. Researchers studying travel behavior have determined that people perceive a greater burden for out-of-vehicle wait time, as opposed to time spent sitting on a bus or going to the bus stop. If, at Yosemite, a person must wait for a bus for some time and then wait an extra two hours and twenty minutes for the next bus because the first had too many passengers, that person will evaluate that wait time harshly when deciding whether to use the YARTS service again or recommend it to a friend.

Most of the stakeholders interviewed in this research did not appear to have a good understanding of the effect of frequency of service and headways (the number of minutes between buses). Transit professionals typically regard service frequent if a bus comes every ten minutes or fewer (Table 4-1).

- The Zion Canyon Shuttle has truly frequent service on its park route, which runs on headways of six to seven minutes during peak hours. On the town route, the shuttle runs on fifteen-minute headways, which came as the result of a service adjustment in the first year to allocate more resources to the park route to respond to passenger demand. Transit system organizers there consider the fifteen-minute service frequent and see no reason to publish a schedule, but transit research shows that passengers do consult schedules when they might have to wait more

than ten minutes for a bus, and fifteen-minute headways rank C in transit level of service, as indicated in Table 4-1.

Table 4-1: Service Frequency Level of Service (*68*)[1]

Level of Service	Headway (minutes)	Vehicles per Hour	Passenger Reaction
A	Less than 10	More than 6	Passengers don't need schedules
B	10-14	5-6	Frequent service, passengers consult schedules
C	15-20	3-4	Maximum desirable time to wait if the bus or train is missed
D	21-30	2	Service unattractive to people with other transportation options
E	31-60	1	Service available during hour
F	More than 60	Less than 1	Service unattractive to all riders

- On Cape Cod, the Town of Eastham is considering building a new beach for public access because residents cannot access Coast Guard Beach on the National Seashore by private vehicle, and the fifteen-minute headways of the shuttle service do not meet local needs. Many workers in the area hold multiple jobs, so if they have three hours between jobs, the workers do not have time to wait fifteen minutes each way for a shuttle; furthermore, shuttles fill to capacity at peak times, leaving passengers waiting another fifteen minutes for the next shuttle.

[1] Adapted from exhibit 5-5 of the *Transit Capacity and Quality of Service Manual*.

- Reliability is the biggest complaint for the Provincetown-Truro Shuttle on Cape Cod. Buses run on twenty-minute headways, so a missed run can mean substantial inconvenience or missed appointments. Local businesses complain that unreliable service means employees do not arrive on time for shifts. With working hours, dinner reservations, and tee times, unreliable transit service affects tourists, employees, local businesses, and the reputation of shuttle systems in gateway communities. If local conditions, such as traffic or driver dependability, make reliability difficult to ensure, then increasing frequency could help. If buses depart every ten minutes and one run is missed, it is less important than a missed run on twenty-minute headways.
- Acadia and Bryce Canyon have long headways for transit routes, but buses run on fixed scheduled that are well-publicized. Stakeholders in these parks made no major comments about how frequency affects ridership or perceptions of transit.
- Denali uses a reservation system for its buses, such that people expect to ride at an appointed time. Frequency does not matter as much because people do not think in terms of riding any bus that arrives.

Transit administrators must strike a delicate political balance between frequency and cost. Decreasing the time between buses can add substantial cost to a transit contract. On the other hand, a high frequency will make the system more attractive to visitors, which leads to greater ridership and greater achievement of the goals of transit. Convenience goes hand in hand with frequency, and people will choose to ride a bus rather than take a car if it is more convenient to ride the bus. Transit studies have shown that ridership has an average elasticity of 0.5, meaning that a ten percent increase in

frequency will result in a five percent increase in ridership. Frequency improvements on routes with three or fewer buses per hour typically generate the largest increases in ridership (*69*). Distance is another important consideration. The Zion Canyon Shuttle covers only a six-mile road in the park, whereas trip times on the full YARTS trip between the Yosemite Valley and Merced take three hours from end to end on an 80-mile (129-km) route. Frequent service at Zion is easier and less expensive to achieve than at Yosemite.

Several service characteristics and route factors contribute to the effectiveness of transit in attracting riders. The impact of attention to or neglect of these factors cannot be isolated from the data collected in the parks in the first few years of service, but these factors have been documented in various ways as having substantial impact on how well service is implemented and received by the public.

4.4.4. Route Structure

Route structure determines how well buses reach park attractions and serve the needs of visitors to get to where they want to go. The design also defines both the number and types of local businesses a bus system reaches. Overall, route structure shapes the ability of transit service to replace private vehicles as a viable system to reach destinations; therefore, route structure directly influences the ability for transit to attain its goals.

Many factors, both natural and political, contribute to transit route structure design.

- The topographic nature of the landscape can predetermine where buses have enough power to take a full passenger load up mountains or other steep grades, as occurred in Acadia National Park where the propane powered buses do not serve Cadillac Mountain.

- Topography also affects the ability for buses to accommodate standing passengers safely and even the propensity for passengers to feel motion sickness. The YARTS system serving Yosemite will refuse passengers rather than allow them to stand as the buses wind through the mountains, so bus capacity is more limited there than in other parks where peak demand might be met by squeezing more passengers onto buses as standees.
- The design of existing road infrastructure might not allow streets wide enough to accommodate buses stopping, as at Somesville outside Acadia National Park.
- Road infrastructure also gets tight in Provincetown where the shuttle on Cape Cod travels, but in this case, the shuttle can generally travel wider roads near the most congested parts of town. A grid road infrastructure allows alternate routes.
- The distribution of commercial developments in a region can dictate the distance a route must cover or the businesses it can serve. For instance, buses travel for hours on regular routes outside of Yosemite without serving all relevant gateway communities, whereas the Zion Canyon Shuttle runs a single fifteen-minute route outside the park and reaches all businesses in its primary gateway community.
- Particularly where gateway regions stretch across long distances, available resources have a large impact on the ability of transit to serve all the destinations system organizers would like to reach. The Bryce Canyon Shuttle, which had intended to expand its route structure to reach more local businesses outside the park, had to cut back on routes because it could not afford the operating costs of the original design.

- Topography partially creates the need for transit in Denali and Hot Springs. In Denali, the telescoping road cannot handle heavy traffic safely, and oversized recreational vehicles cannot navigate the switchback turns on the road leading to the tower in Hot Springs.

While many of these factors determining route structure come as natural nonnegotiable conditions, others come through the decisions of transit system organizers and local leaders.

4.4.4.1. Land Use and Businesses Served

To reach the goal of reducing traffic congestion in the park, transit system design must comprehensively meet all mobility needs of visitors. Failing to connect to one leg of a visitor's journey will likely put that visitor in a private vehicle for the entire day, which will reduce the intended impacts of the transit system. As mentioned in the discussion of the impact on local businesses, Acadia's Island Explorer planners tied route structure to financial contributions to the system. This policy created one of the most financially viable systems serving national parks and gateway communities; however, decision makers for the system need to keep in mind a question: if transit does not serve small businesses because they cannot afford annual fees for front-door service, are visitor needs met? This question must be resolved locally because it requires a balance of financial responsibility through this funding scheme versus the equity concern of serving all businesses fairly.

The responsibility for reaching all businesses does not rest solely with the transit system organizers. From the moment that parks and communities seriously entertain the idea of implementing transit service, local community leaders need to think how to

design their own land use for transit-oriented development. Buses have a difficult time serving long highways with strip development of commercial establishments, but transit works well with clusters of businesses where visitors can walk from business to business and meet in a central location to board the bus.

- At Bryce Canyon, customers of the hotels and restaurant closest to the park-and-ride lot must cross a crowded multi-lane state highway at a curve. This design makes transit access particularly unappealing for pedestrians.
- Outside Zion National Park, the Town of Springdale's planning guidelines to develop with alternative transportation in mind will help the partnership with the community grow.

Local politicians, planners, chambers of commerce, and individual businesses must all take initiative to make transit access easy, safe, and appealing for visitors.

4.4.4.2. Regional Connections

Visitors look for seamless transportation alternatives. The most seamless transportation system will accommodate visitors from the time they enter a park region until the moment they leave, which means that transit service must connect with major transportation hubs in park regions. Visitors need a way to get to the park without a private vehicle.

- Denali's train station brings half of the park's visitors to the area without private vehicles, so visitors depend on bus service at the station. Buses from a variety of providers take them to the visitor center and hotels.

When visitors pay a daily rental rate on a private vehicle, they typically want to drive it. If they never rent the vehicle, parking and traffic problems can subside, and visitors will not feel anxious about leaving a vehicle far from where they engage in activities.

- In 2000, a survey of Island Explorer riders at Acadia showed that no visitor groups that had arrived at the local airport had rented a car, while half of all the groups that had landed at a larger regional airport with no transit service had rented cars (*82*). Island Explorer planners are considering ways to serve the regional airport, which is located 46 miles (74 km) north of the area. The Island Explorer already serves another major terminal for regional transportation: the ferry dock with daily service to Nova Scotia.
- For the City of Hot Springs, the city bus route going to Little Rock, which is nicknamed the airport shuttle, has the highest ridership of all city routes. Hot Springs also has a general aviation airport which just attracted commercial service from Mesa Airlines. Local economic developers see the airline's arrival as a boon, but the transit operator speculates that the nineteen-seat scheduled flights will still not create enough demand to justify bus service to the airport.
- On the east side of Yosemite National Park, Mammoth Lakes faces a similar situation with new airline service at a small local airport.
- Cape Cod faces a unique situation related to local stakeholders. To protect market share for local taxi companies, the Provincetown-Truro Shuttle specifically does not serve the local general aviation airport.

- Other parks do not have the same proximity of transportation resources. The closest major airports to Zion and Bryce Canyon sit in Las Vegas and Salt Lake City at a distance requiring roughly three or four hours of driving.

Not all parks have large convenient regional transportation hubs that transit system organizers can target, but if any such facilities exist, buses should serve them, and seamless transportation on the shuttle should be advertised through the park and through local visitors' bureaus and chambers of commerce. Some skeptics question whether airline passengers would ride buses, but the data do show that foreign tourists, who might make a high percentage of visitors arriving by air, particularly choose transit as their mode of transportation.

4.4.5. Design of Stops

Transit system organizers in all park transit systems seemed to understand how to identify the major activity centers and serve them with stops, but some lessons came with experience. In early efforts, several transit operators learned about the importance of making the layout of stops intuitive to visitors because recreational communities attract large crowds of people unfamiliar with local geography and transportation systems. Other lessons concerned the operational characteristics of the stops.

Both in Zion and in Acadia, bus drivers observed that visitors understand that buses will go in the direction in which they are pointed.

- At stops where some buses go one direction and some go another, such as at the museum in Zion, where buses going into and out of the park pull into a single loading area, visitors get confused on where to stand and whether the bus will take them where they want to go.

- In the case of Acadia's Island Explorer, the transit planning team learned that bus routes need to terminate at the hub. If a route had the hub as a midpoint and the bus could go one of two directions from the hub, visitors felt confused about which direction the bus would take.
- Visitors riding buses in Yosemite Valley experience similar confusion where bus routes cross in a figure eight.
- Bryce Canyon uses fixed stops, but stakeholders reported no confusion related to these stops.

Notably, most transit stakeholders did not recognize the different functions and impacts of flag stops and fixed stops. Most of the stakeholders interviewed in this research project seemed to deem equivalent both fixed bus stops and situations where passengers must request stops by flagging the bus driver; however, experience suggests flag stops benefit neither visitors nor gateway community businesses as much as fixed stops. For visitors, people do not know where to ask to stop when they are visiting an unfamiliar vacation community. For businesses, no one will ever accidentally get off at a flag stop and decide to wander into a souvenir shop there.

The parks in this study use fixed stops, flag stops, or combinations of the two.

- Denali National Park operates on park lands with a combination, taking tourists to popular viewpoints at fixed stops and allowing hikers access to the land and return transportation by flagging.
- The Zion Canyon Shuttle works with mostly fixed stops, but it has two flag stops in town. These flag stops are really optional fixed stops… the location is fixed, but the bus stops only if requested, and drivers might announce the option to stop

there. Businesses at the flag stops had rejected having fixed stops at the time of shuttle planning, but after seeing visitor circulation with the shuttle, they requested some form of stop to create access for bus passengers.

- Acadia's Island Explorer allocates fixed stops based on annual fees; visitors can flag stops at businesses that cannot afford to pay annual fees.
- The trolley at Hot Springs runs on flag stops, but the transit operator plans to harden sixteen designated stops to discipline passengers to gather in one place. Concentrating passengers at fixed stops helps drivers control the amount of time spent stopping.

Flag stops require a leap of faith from recreational visitors. They have a limited number of vacation days, and they need to get from one place to another. Someone tells them that if they stand on the roadside, a bus will come with a friendly driver who will see them and stop. Can they believe the bus will come? Would they believe the bus will stop at a place where nobody built any benches? If they do not know the area, can they be sure they are standing where the driver will see them? Would it be easier for them just to take the car? In places where flag stops mix with fixed stops, visitors favor fixed stops. The transit operator for Acadia's Island Explorer estimates that 90 percent of riders use fixed stops, rather than flagging for an informal stop, leaving businesses outside of a quarter-mile range of fixed stops underserved.

Flag stops do make sense in some situations. If all stops on a route require flagging, as on the Provincetown-Truro Shuttle on Cape Cod, then they serve all business along routes equally. The shuttle route covers miles of road with no concentrated development for logical fixed stops. With no clustering of cottages or single buildings with high

occupancy, no strong potential locations for fixed stops exist (Figure 4-5). In places where the bus cannot practically stop at all businesses, flag stops allow universal access.



Figure 4-5: With no concentrated gathering points, the highway in North Truro near Cape Cod National Seashore is conducive to flag stops.

Transit system organizers need to make informed decisions on how and when to use flag stops versus fixed stops. Stop structure largely follows from priorities already decided, such as where parking exists and whether businesses need to pay to have the bus stop in front of them. Common sense can also dictate many of the decisions, such as putting stops near major activity centers (scenic attractions, large hotels, or popular restaurant areas) and avoiding places that contain safety hazards. Depending on the level of analytical capability available to transit system organizers and the size of the gateway community, it might make sense to do geographic analysis of local businesses to determine where stops would serve the largest number of tourism-oriented businesses. As a general rule, many transit planners figure that most people will walk no more than a quarter mile (400 m) to a bus stop (*68*), so businesses within a quarter mile of a fixed stop can be considered well served by transit. In any event, local stakeholders need to

understand the different responses that visitors give to flag and fixed stops before making decisions on stop design.

4.4.6. Vehicle Restrictions

Private vehicle restrictions generate a large amount of public debate. The benefits of private vehicle restrictions echo and amplify the benefits of general shuttle service: noise and air emission abatement, reduction of visitor time spent in traffic congestion, the increase in safety associated with a reduction in traffic, and so forth. People familiar with the long-standing bus service in Denali National Park say more visitors see nature in action there because traffic volumes do not scare the wildlife away from the road, and animals have learned not to fear buses because drivers keep passengers on board when animals approach. In terms of the natural environment, most people agree that reducing the number of vehicles in parks will benefit wildlife and the natural resource, but people do not know what impact such restrictions will have on the visiting public and on gateway communities. For park visitors, some people see restrictions as an impingement on personal freedom of movement, whereas others see them as a means to freedom from traffic gridlock. Proponents say restrictions help more people see parks instead of watching the road, while opponents say the restrictions force people onto established routes and schedules.

Among the case study parks, the National Park Service does not allow private vehicle access on some park roads in Zion, Denali, and Cape Cod.

- Acadia National Park is considering private vehicle restrictions. Some stakeholders there expect them, and a limited number of visitors are calling for them (*70*).

- The 1980 general management plan for Yosemite National Park intends to eliminate of private vehicles from the Yosemite Valley.
- Some visitors to Bryce Canyon National Park who arrive from Zion have inquired about implementing private vehicle restrictions at Bryce Canyon, as well, but administrators there feel the road network of Bryce Canyon does not lend itself to private vehicle restrictions in the way that Zion's network does.
- In Zion, the Zion-Mount Caramel Highway and other park roads allow park access to people who simply do not want to ride the shuttle, but the spinal road network of Bryce Canyon would not allow alternative access points for private vehicles if the primary area of traffic congestion falls under private vehicle restrictions.
- In contrast, Denali National Park has had private vehicle restrictions on its spinal road since 1972 and the opening of highway access to the park.
- The debate of alternative means of private access could manifest in new construction on Cape Cod, where the Town of Eastham is considering building a new beach, so local residents can circumvent the private vehicle restrictions of Cape Cod National Seashore's Coast Guard Beach. Shuttle capacity and frequency there are cited as motivating factors. As mentioned in the prior discussion of frequency as a contributing factor, workers with three hours of free time between jobs do not have time to wait fifteen minutes each way for a shuttle, particularly when shuttles might fill to capacity, forcing people to wait for the next shuttle.

- Stakeholders indicated no need or plan for private vehicle restrictions at Hot Springs National Park.

At parks with private vehicle restrictions, stakeholders support the restrictions, calling them necessary. Many people cite traffic safety as primary justification for the restrictions, and general frustration with traffic congestion also validates such policies. Even so, public reaction shows some negative sentiments.

- The Yosemite Plan to eliminate private vehicles in the valley has caused local turmoil for a number of reasons. Pragmatically, the simple topography of the area (winding mountain roads eliminating the possibility for standees at peak demand and raising the specter of motion sickness) makes the park less conducive to vehicle restrictions.
- In Zion, locals support restrictions in the canyon, but residents look forward to the off-season when they can drive their own vehicles because it takes significantly less time to drive directly to a destination than to stop at all the stops to allow boarding and alighting of passengers.
- In recent years, Denali National Park started offering a lottery to give a limited number of private vehicle drivers access to its park interior on a weekend in the fall shoulder season. The lottery was intended to open the park to local residents who now consider the shuttle too restrictive and too expensive (it used to be free), but the chance to win one of the 1,600 access passes available generated 18,500 lottery entries in 2002 from Alaska, the continental United States, and other participants around the world, even though the August lottery drawing leaves only a few weeks to arrange a trip to the area for a September weekend.

As with any introduction of shuttle service, stakeholders in parks considering private vehicle restrictions tend to feel anxious about coming changes. Where private vehicle restrictions do exist, local stakeholders seem to support them in principle; however, in practice, many people have demonstrated that they will take the opportunity for private vehicle access when it is available. Many stakeholders around parks with private vehicle restrictions commented on how they liked to drive their own vehicles when restrictions end for the season or when they have special passes.

In terms of impacts on local economies, Zion provides the most clear-cut example of change from no transit service to full private vehicle restrictions. Zion implemented restrictions in the Zion Canyon, but the Zion Canyon Shuttle operates as a voluntary transportation alternative in the local community. Different types of businesses have experienced different impacts. In terms of restaurants, the Zion concessioner inside the park gained lunch traffic because people are less inclined to leave the park for a meal and to return in the afternoon. Instead, they stay in the park at lunch; however, the dinner crowd in the park diminishes at the end of the day. Correspondingly, the restaurant community outside Zion lost lunch crowds but gained dinner crowds roaming a little later in the evening than they did previously. The elimination of traffic congestion in the canyon increased safety for bicyclists, so demand for bicycle rental services has risen. Where people must take purchased goods onto buses instead of putting them in car trunks, retail sales have decreased. The concessioner at Zion Lodge inside the park has experienced a decline in souvenir sales, and even the retail businesses in the community without restrictions are reporting mixed results.

4.4.7. Vehicle Substitutes

Most transit systems answer to an explicit or implicit goal to replace private vehicle trips with shuttle trips, but some systems also involve other types of vehicle substitutions. At Cape Cod, for instance, concern that shuttles would harm local businesses by replacing private taxi operations spurred a policy to reserve airport access for taxi cabs in the short term. In Acadia, the road up Cadillac Mountain is similarly unserved by shuttle to set it aside as a tour bus route.

Commonly, shuttle trips replace trips taken in recreational vehicles (RVs) because large vehicles cannot easily navigate narrow streets, congested traffic, and sharp curves.

- The switchback curves of Hot Springs National Park make the trolley a necessity to allow access for people in recreational vehicles, although the trolley does not currently serve the Gulpha Gorge RV campground.
- Transit systems at Zion and Bryce Canyon explicitly serve private recreational vehicle campgrounds.
- If private vehicles were permitted in Denali National Park, roadway geometry on the access road would similarly make recreational vehicle access impractical. The recreational vehicle campgrounds outside Denali have shown some of the strongest enthusiasm for creating new shuttle service outside the park.

In some cases, transit system organizers talk about replacing buses with buses. Often, the justification comes in terms of operating capabilities.

- In Denali, school buses serve as both shuttle and tour vehicles because typical commercial tour coaches cannot negotiate the road. For this park, the same concessioner operates both the tour and the shuttle service. Local residents

perceive that the concessioner pushes tours on visitors because the tours offer greater profit potential, but the company denies that claim, saying that it uses different telephone numbers for reservations for the two services.

- Similar to the reservation of the taxi route to the airport on Cape Cod, Acadia's Island Explorer does not serve Cadillac Mountain to preserve tour bus business; however, as another reality of the situation, the propane Island Explorer shuttle buses lack the power necessary to scale the mountain, so diesel tour buses provide the only bus access.
- In Zion National Park, where noise abatement stands as a the primary goal of transit, some transit proponents would like to see propane-powered shuttle buses replace diesel-powered tour buses going to the Zion Lodge. Under this plan, tour company customers with all of their luggage would change buses at the entrance to the park for the last leg of their journey from the park entrance gate to the lodge, lowering noise levels in the park, but adding inconvenience to passengers and introducing new costs to the shuttle system.

In places where private transportation operators provide service, replacing the private transportation service with publicly provided shuttles has both advantages and disadvantages. On the positive side, consolidating to a public service can add order to a system where multiple private operators offer a confusing web of routes, and visitors can more easily interpret a single map and time table. For Zion National Park, standardization to the propane-powered shuttle will mean all vehicles make the lowest level of noise possible using modern technology. Public provision of shuttles can guarantee service to all locations the public deems worthy, which might include locations

with low profit potential, such as small businesses or campgrounds frequented by lower-income visitors.

In contrast to these benefits, people raise questions about the wisdom of replacing private transportation service with public shuttles. Private transportation operators cannot compete with subsidized or fare-free public service, so public shuttles can directly harm local businesses, as local tour bus operators in case studies have indicated. With that subsidy comes the public assumption of the high costs of providing transit. At Zion, where shuttle proponents would like to replace tour buses to the Zion Lodge, costs now voluntarily assumed by private operators will shift to taxpayers at a time when park transit planning has uncertain funding sources. Public service provision also eliminates the market motivation for product distinction and improvement, such as amenities, a more comfortable ride, price competitiveness, and incentive to cut operating costs.

Finally, standards for public service provision are not guaranteed, but if publicly-provided operations fail to meet public expectations, the government must answer to the voting public. At Yosemite, for example, shuttle opponents are now publicly debating the practice of using a 1986 fleet of diesel buses to replace more modern private vehicles manufactured under the stringent modern standards of the California Air Resources Board (CARB). With all of these considerations, vehicle substitutions might make sense in some situations and might do more harm than good in others. Planning for vehicle substitutions must occur on a case-by-case basis.

4.4.8. Parking Strategies

Parking is a primary motivation for implementing transit service in many parks. The City of Hot Springs, for example, is addressing downtown parking problems by building

a new parking garage across the street from the signature bathhouses of the national park. Managers in many national parks are realizing that they cannot satisfy an ever-increasing demand for parking without seriously damaging the natural resources that national parks are meant to protect. In some cases, physical barriers prevent parking expansion. For instance, Zion has limited room for development in the canyon where most park visitors go. In other cases, park managers want to set policy limits regarding how much infrastructure will support private vehicle traffic. The Yosemite Valley Plan calls for reduction of parking capacity in response to a goal in the park's 1980 general management plan to eliminate private vehicles in the valley.

Even if all tourists to national parks take transit, parking must somewhere exist to handle the vehicles that visitors use to reach the parks. The strategy chosen for a private vehicle parking plan will affect the way that visitors interact with the shuttle system and with local businesses. Bryce Canyon and Zion National Parks use strikingly different parking plans.

At Zion National Park, the local parking strategy expects most people to leave their vehicles parked at their hotels or in town. A new 400-space parking lot accommodates some vehicles next to the visitor center near the park entrance, and the gateway community provides an overflow parking lot just outside the park; however, these two lots combined cannot accommodate all of the vehicles for the two million annual riders of the Zion Canyon Shuttle. While planning for the new traffic management strategy, local leaders asked how many spaces each business in town could dedicate for park-and-ride use. Many businesses donated small numbers of spaces that added up to a viable parking capacity for the town (500-700 parking spaces spread across town and at individual

businesses). In the first year, most visitors competed for the limited spaces in the lots near the visitor center, but through communication and education in the park and community, local leaders perceive (and ridership data support) that in subsequent years, more visitors started parking in town and took the town shuttle loop to the park.

Whereas Zion disperses much of its parking demand across the gateway community and amongst local businesses, Bryce Canyon National Park has concentrated its parking in one dedicated location. Bryce Canyon pays a contractually obligated $300,000 annually in rent for a staging area built specifically to serve the shuttle. Situated outside the park, the staging area adds an extra half mile onto every transit trip. Under financial pressure in the third year of the contract, Bryce Canyon National Park opted not to use the staging area to cut the cost of operating across that half mile. For that tourism season, shuttle riders parked at the local lodge. The Bryce Canyon Shuttle used the staging area again in 2003.

Each parking strategy has strengths and weaknesses. The dedicated staging area offers a secure place to leave vehicles, restroom facilities, and general information on the park. System designers wanted to create the feeling of entering park lands from the point of accessing transit. On the downside, the staging area defeats one of the well-documented benefits of transit: where people change modes of transportation, commerce has an opportunity to develop. People are far less likely to get off a bus for the purpose of buying a trinket than they are to stop in a store while they are waiting for a bus after they get out of their cars. With no businesses around the parking lots, the staging area curtails potential economic benefits to the gateway community.

The Zion strategy offers less central control and oversight, but it has important advantages. From an economic standpoint, the Zion strategy makes more sense both in terms of contract cost reduction and in terms of supporting local businesses. Commercial development occurs naturally where people change modes of transportation, as evidenced by hotels and restaurants near airports and the historic development of metropolises along the coasts at major ports. Putting shuttle parking near businesses encourages people to wander into businesses while waiting for the bus or after they get off the bus. Impulse-oriented businesses can do particularly well in such settings. For instance, someone waiting on a hot day might be inspired to buy an ice cream or fudge, whereas, the same person might not feel inspired to make a photocopy or send a fax. The Zion model also offers an environmental benefit because it does not require people to drive private vehicles from their hotels to the staging area. Especially in areas with air quality concerns where every vehicle start exacerbates a pollution problem, parking plans should consider the philosophy of leaving cars parked at hotels and recreational vehicles (RVs) parked at campgrounds.

Acadia adopted a parking strategy similar to Zion's in that the shuttle collects passengers from lodges and hotels along the major access highway, although downtown businesses are not served by the shuttle. Some local residents feel that creating a downtown shuttle loop would mitigate parking demand for people driving from one end of town to the other.

4.4.9. Communication

Although related to partnering, communication encompasses a larger spread of information. It involves educating and keeping informed not only the people designing

the system, but also the people using the system (visitors) and the people who interact with the people using the system (local businesses, front-line workers, and local citizens). Communication plays a vital primary role in shaping public reaction. If people do not know about transit service, they will not use it. If they get confused trying to use the service (particularly if they end up at the wrong place or miss appointed times because of confusing schedules), the public will react negatively to it. In the case studies, local opinion already generally favored shuttle systems, but improved communication and education for local businesses and visitors will help promote shuttle use.

Communication often falls through the cracks of engineering design, but many of the needs and opportunities in the case studies relate to communication. To expand visitor use of transit, local employees who interact with the public need training to know how to respond to questions about transit service. To help make the system more visitor-friendly, visitors need several forms of media to tell them about it.

4.4.9.1. Communication with the Media

Communication requires sensitivity to the strong effects of subtle nuances, such as wording and presentation. Common in several of the case studies, gateway community leaders expressed frustration over the portrayal of transportation issues in the media.

- Yosemite businesses report that ever since the media reported that the park had closed when traffic congestion triggered implementation of the Restricted Access Plan in 1995, visitors have expressed concern that they would not have access to the park, even though riders on the YARTS shuttle have guaranteed access.
- Visitation is down for all parks in the region around Zion and Bryce Canyon, and many gateway community representatives feel that annual negative media

messages about congestion in parks are reducing visitation, hence the messages reduce the potential for economic gain in local businesses.

Messages appearing in the media often originate from public relations decisions, and gateway community leaders recognize the need to craft public relations campaigns. When the Maine Department of Transportation designed a campaign to publicize its 511 tourism information network, part of the campaign involved showcasing the intelligent transportation systems (ITS) implemented in and around Acadia National Park. The Bar Harbor Chamber of Commerce publicly objected in fear that discussing technology alerting visitors about full parking lots might scare potential visitors by giving a negative message about traffic congestion on Mount Desert Island. The Chamber perceived that a negative economic impact on the tourism community would result from the way the media portrayed transportation technology intended to alleviate traffic congestion and improve visitor experience.

Stakeholders at Cape Cod, Hot Springs, and Denali raised no concerns about the media. Perhaps transit has no reason to attract media attention in these settings. Park-oriented transit systems at Cape Cod and Hot Springs both operate amidst larger regional systems; therefore, the smaller systems fit inconspicuously in a larger transit context. In Denali, where the shuttle has operated for three decades, local communities and visitors have grown accustomed to the presence of transit.

4.4.9.2. Communication with the Visiting Public

Many transit operators and planners do not understand the powerful impact of communicating the basic facts of transit service. Glacier National Park recently made minor changes to its low frequency hiker shuttle service, including posting schedules at

bus stops. Ridership doubled. People need to know about and understand service before they will be willing to use it.

Among the case study parks, several did not readily offer basic information to the visiting public.

- For instance, visitors cannot readily obtain maps of Yosemite's YARTS route structure and coverage.
- Similarly, Denali's shuttle operator publishes no schedules for public distribution, so visitors must call or appear in person to learn preliminary information needed for trip planning.[2] Denali's transit operator limits access to shuttle information on purpose to avoid confusion with the different bus schedules used at different times of the year. With the expansion of shuttle service into the fall shoulder season in 2003, Acadia's Island Explorer now faces the same challenge.
- Acadia, Zion, and Bryce Canyon publish route maps and schedules of all routes in park newspapers. At Acadia, a nonprofit organization has further developed a comprehensive pamphlet (available for a fee) describing routes, destinations, and recommendations for how to tour the park on the shuttle.
- Acadia's communication plan for the general public has limitations. Several stakeholders for the Island Explorer commented on a general lack of communication to the public on important issues such as the start and end dates for seasonal service. The shuttle operator reported that it gets calls from visitors

[2] Since the time of the site visit, Doyon-Aramark has begun listing schedules on the Internet and taking onlinereservations with links to the corporate partner provided from the website for Denali National Park and Preserve.
http://www.nps.gov/dena/home/visitorinfo/bus/index.html

who need to change the way they had planned to travel the island before and after the operating season because they had expected to use the Island Explorer.

- A brochure indicates the route and schedule for the trolley at Hot Springs, although the brochure mistakenly fails to indicate that the trolley goes into the national park on Hot Springs Mountain Drive. At the time of the site visit to Hot Springs, it was difficult to determine how well the brochure was distributed because some information providers had withdrawn the brochure while the trolley did not operate off season.
- Little information existed on the Provincetown-Truro Shuttle at Cape Cod. With seasonal workers heavily using the shuttle heavily for commutes, perhaps the shuttle had sufficient demand without generating more interest from visitors.

Tourism industry market researchers monitor the best ways to disseminate information to the visiting public, and parks often include in visitor use surveys questions about what sources people use to plan their visits to parks. Typical media include travel guides, tour books, park web pages, and web pages about gateway communities and area businesses. Once visitors arrive in the local area, they refer to such sources as local tourist publications, visitor centers, chambers of commerce, and local residents.

4.4.9.3. Communication with the Local Community

Communication with the local community came as an afterthought in most of the case study transit initiatives, but Zion perhaps offers the best evolved model of general communication. Organizers are starting to have training for front-line workers in the town. The local chamber of commerce is considering ways to give information to visitors about the types of businesses located near transit stops. In the first years of

service, communication about the Zion Canyon Shuttle evolved, and when seasonal employees throughout the gateway community were trained to inform people about the shuttle, ridership on the town route increased and visitor acceptance of alternative transportation appeared to grow.

Most parks fall far behind Zion in their strategies for communicating with local businesses and residents.

- Local businesses around Bryce Canyon have no understanding of the motivations of changes to the shuttle system, and local residents expressed frustration at lack of consistency in operations. The businesses also have no sense, knowledge, or guidance for how to use the shuttle to create local economic gain.
- At Cape Cod, business owners generally feel the Provincetown-Truro Shuttle does not directly affect their businesses, and they had no further information on existing or potential benefits that businesses could realize.
- Acadia's local businesses have never been educated on how to take advantage of the benefits of the intelligent transportation systems (ITS) installed at major bus stops, which makes it difficult to attain the vision of disseminating information to visitors through Internet web displays in local business store fronts because businesses will not invest time and money into computer equipment to display the information. Interviews revealed a general lack of understanding among businesses regarding how to work with the visiting public to help people with the shuttle system. The need for information dissemination in the local community appeared as early as 2000, when most businesses received daily questions about the Island Explorer. Even at businesses distributing schedules, employees felt

they knew too little about the system to provide personal information or perspective (*86*).

- Yosemite's YARTS system offers discounts for groups and allows special fares, but the system withholds publishing these offerings because some retailers do not want to deal with the confusion of different types of fares.

Transit system organizers need to use multiple means of reaching out to local residents and businesses to disseminate information. Potential means for communicating with local communities include:

- **Pre- and early season orientation sessions** for all seasonal employees who interact with the public, whether employed in parks, with concessioners, or by local businesses should teach people serving the public how to answer questions about how to get around the park and the town.
- **Web sites and local newspapers** should post strategic planning, milestones, and reports about shuttle service, so the local public knows what to expect in terms of service changes and development.
- **Transit representation at town and chamber of commerce meetings** provides another essential means of communicating transit service strategies beyond the planning partners to the local public affected by the system.
- **Published bus schedules** need a wide distribution among local establishments, so local businesses have information readily available to answer visitors' questions. As a side benefit, the wide distribution of bus schedules also contributes to shuttle presence in visitors' eyes.

Communication with the local public requires redundancy of efforts. No one medium will reach all local residents, so multiple media must spread the information.

4.4.9.4. Overlapping Communication Issues

Some communication issues cross the lines of these categories targeting the media, the visiting public, and local communities. Local citizens frequently visit parks as the general visiting public, and the information that goes to local citizens often disseminates to the general public.

- Denali has faced a situation where local business owners perceive that the concessioner, which operates both tour buses and shuttle service, will push visitors to choose a more expensive bus tour when they call for telephone reservations. The concessioner says it addresses this concern by offering different telephone numbers for the shuttle and tour reservations, but the local businesses either do not know about this precaution, or they do not consider it effective. Either way, the concessioner could gain more support from local businesses through better communication with local businesses about the reservation system, to the general visiting public, or both.
- Similarly, the portrayal of Acadia's intelligent transportation systems in the media overlaps in its presentation to the local businesses. Through conflict with a local chamber of commerce in 2003, public relations experts in the Maine Department of Transportation learned that they need to communicate with the local business community before and at the same time they work with the media to release information.

- An earlier communication conflict for Acadia's Island Explorer surrounded the advertising of the system. Soon after service inception, local businesses felt they were doing all the advertising for the system. Representative businesses said they would like to see the Island Explorer planning committee do more publicizing (*86*). Meanwhile, the Island Explorer planners designed different plans. With demand regularly reaching or exceeding capacity, marketing efforts for the Island Explorer were purposely limited (*71*). Although objectives of different stakeholders might contradict each other, such discrepancies should stand in public light and open communication, so the stakeholders can reach consensus, or at least understanding, on what happens in the present and how to address different stakeholder needs through strategic planning. If left unspoken, these discrepancies can fester and instigate ill will.

Communication and education are vital components to making shuttle systems produce benefits for visitors, parks, and businesses, and case study parks have shown that the interrelation of different aspects of communication requires attention. Providing that attention requires the allocation and dedication of transit planning resources to communication strategies that move beyond partnering. One stakeholder noted that despite the need for strategic communication, Acadia employs no one dedicated to public relations. Knowledge carries over from year to year as some visitors and seasonal workers return. The largest need for public relations and publicity comes right at the startup of a shuttle system… the time when most case study parks have dedicated the least attention to public relations.

Notably, despite a thorough communication campaign coinciding with the start of service, park transit system organizers cannot expect a strong public familiarity to develop with their systems. Public service providers in non-resort communities benefit from residents gaining familiarity over time and sharing their knowledge with newcomers. In contrast, the tourist population of recreational areas, where typically more than half of the people visit for the first time each year, will never gain a strong familiarity with transit service. Communication will remain an ongoing primary requirement of transit operations, necessary for maintaining impacts of transit in accordance with local system goals.

4.4.10. Intelligent Transportation Systems (ITS)

Of the case study parks, only Acadia has received the benefits of a field operational test of intelligent transportation systems involving technology supporting transit operations; however, more parks will likely consider and implement intelligent transportation systems within the next few years. Even before the start of Acadia's ITS project, the Island Explorer's transit operator recognized the need for a bare minimum of technology: radios on buses to allow communication between the bus depot and drivers, which enables the operations center to manage activities in the field and answer questions about bus arrivals for the public. The full installation of the field operational test equipment provided technology for transit management, traffic management, and real-time traveler information.

Real-time information regarding bus departures can help many park shuttle systems overcome difficulties associated with low-frequency routes. Among the case study parks, state-of-the-practice standards for transit would rate only the park route of the Zion

Canyon Shuttle as offering frequent service without the need for posted schedules (using the standard of ten minutes between buses to define high frequency). Surveys of transit riders have shown that people will consult schedules whenever buses depart at intervals greater than ten minutes (68). The real-time information of GPS-equipped buses gives confidence in the reliability of transit.

- At Cape Cod, where buses frequently fall behind schedule due to traffic congestion or other factors, such technology could help employees accurately report their expected arrival time and could help visitors make travel plans for activities that require punctuality, such as golf tee times or dinner reservations.
- Experience with Acadia's Island Explorer has demonstrated that visitors respond to technology and make choices accordingly, as evidenced in the 2002 survey of visitors that showed that 80 percent of bus riders made the decision to ride at least in part due to seeing signs with real-time bus departure information (*74*).

Partners involved with Acadia's intelligent transportation systems (ITS) hope that the technology will bring economic benefit to the area. Certainly, if Acadia gains a reputation for straight-forward transportation, accessibility, and mobility, the region could attract more visitors. The 2002 survey of visitors found that people who used the Island Explorer and ITS stayed on the island longer than other visitors. Over half of the people who used the shuttle and ITS stayed five or more days, whereas 56.5 percent of other visitors stayed on the island four days or fewer. These data could suggest that shuttle and technology users find the area so convenient that they stay for extended visits; alternatively, people who have planned extended visits might be more likely to try the shuttle and technology because they have the leisure to experiment (*74*).

Yosemite has had experience with ITS geared toward private vehicle transportation. The Yosemite Area Traveler's Information System (YATI) introduced changeable message signs, highway radio information, a website, and information kiosks to provide real time messaging to support a regional transit network (*72*). After the initial trial installation of the system, transportation agencies discontinued support for many of the systems introduced. In an effort to save operational costs, changeable message signs now remain dark even in high season, but ITS infrastructure remains in place for the day when visitation returns or surpasses the peak years of the mid-1990s. The YATI experience potentially indicates several lessons. On the most pragmatic level, the operational expense of transportation technology requires a minimum threshold of congestion to make the system worth supporting. Conversely, YATI has shown a unique flexibility of ITS: when low demand renders the system a luxury, rather than a necessity, transportation organizers can cut operating costs by turning off the technology until the traveling public needs it again. This argument ignores the need to justify the up-front capital cost of installing the equipment by using the system beyond initial project evaluation. Politically, the situation might also demonstrate what happens when local leaders have not fully bought into the usefulness of the technology. In such cases, local decision makers can quickly allocate resources needed to maintain the technology to other projects deemed a higher priority.

Even Acadia's transportation technology has not had full local buy-in. Businesses around Acadia had initially scoffed at the technology before seeing survey results showing that visitors find it useful. Even with that information, the chamber of commerce representing the business community voiced objection to advertising the

technology because potential visitors might associate it with traffic congestion and make other vacation plans. Addressing the skepticism and concerns requires public education, communication, and attention to public portrayal of the technology. Stakeholders in this study further expressed concern about making information displays fit into the landscape architecture and cultural landscape of parks and gateway communities. System designers must work on a case by case basis to understand local character and develop the means of making technology fit that local character. Responses from stakeholders in the Zion Canyon Shuttle case study echoed the skepticism of Acadia businesses, suggesting that Acadia's difficulties gaining acceptance of ITS technology might represent the challenges that lie ahead for other park communities.

With ITS technology still making initial forays into park and recreational community environments, new ideas for customized innovation continue to emerge. Denali has plans to fix cameras on wolf dens, eagle nests, and other unique areas of ecological intrigue, such that a bus arriving near a targeted area will respond to a sensor and broadcast the camera feed onto a monitor in tour buses. Denali's shuttle operator hopes that the use of technology on tour buses will lure visitors away from shuttle buses onto the more expensive tours. Again, private enterprise sees potential to make economic gains based on the niche of technology integrated into local transportation.

Transportation technology has not captured the attention of all parks and transit operators. Stakeholders at Zion, Hot Springs, and Bryce Canyon indicated no plans for implementing intelligent transportation systems.

4.4.11. Presence

Visitors need to feel the presence of park transit systems wherever they go. This presence appears in the form of infrastructure, frequent and identifiable buses, and media about the shuttle. Visibility makes visitors aware of the system and instills confidence that transit will take them where and when they want to go.

4.4.11.1. Bus Stop Infrastructure

Bus stop infrastructure serves many different purposes. It physically comforts people with sore feet and allows the elderly (or simply the tired) a chance to rest while waiting for the bus. Modern infrastructure designs consider wheelchair accessibility under the Americans with Disabilities Act. If the infrastructure design includes a telephone, it provides emergency communication. As an intangible but highly important benefit, infrastructure consistent with the local cultural landscape provides service identity and visibility for the shuttle system in the park and in communities. This presence shows visitors that the bus will take them everywhere they want if they see infrastructure everywhere they go, and it reminds people searching for parking that they could consider another alternative on their next trip. If they never see infrastructure, they might presume that the bus would limit their ability to see and do everything they plan.

Although infrastructure on federal land in parks and along municipal or state right of way in the towns must go through separate procurement and development processes, local communities should work with park infrastructure designers to achieve a consistent design and amenity at all stops on shuttle systems. Visitors do not (and should not) recognize the difference in agencies influencing different stops.

- Outside Zion, Springdale used state funding to build infrastructure that created an "in-the-park" theme.
- In contrast, the Island Explorer has no continuity of infrastructure design (or existence) outside Acadia. Private businesses build their own infrastructure if they want it.
- Outside both Acadia and Yosemite, a small sign often gives the only visual identification of a bus stop.
- The Hot Springs trolley only has noticeable infrastructure at the depot located a few blocks from the main downtown area.
- Bryce Canyon put stop infrastructure only on the most popular bus route in the park. That strategy made particularly good sense in retrospect because contract cuts eliminated other routes, so bus stops on other routes would have confused visitors and probably left people standing to wait for a bus that would never come.
- The shuttle on Cape Cod uses no infrastructure because the transit service uses a flag-stop system.
- Bus service in Denali runs only in the park. Sparsely located stops typically have infrastructure, but visitors can also flag buses from the roadside.

4.4.11.2. Visual Identity of Vehicles

Most of the case study parks and transit systems take pride in new state-of-the-practice vehicles with alternative fuels and the latest technology.

- The Zion Canyon Shuttle features pictures of local flora and fauna.
- Acadia's Island Explorer, Cape Cod's Shuttle, and Bryce Canyon Shuttle buses display prominent logos.

- Buses that run in Denali National Park all have the build of school buses. Buses that run shuttle routes have green paint, and tan paint designates tour buses.
- In Hot Springs, the trolley serving the park has a distinctive look that separates it from the buses of regular transit service for the local community. In that city, community buses are perceived as transportation for low-income residents and an inferior means of travel. The trolley transcends this label, such that people of all walks of life feel comfortable riding it due to its identifiable character.
- The YARTS buses serving Yosemite have not received the same visual treatment (Figure 4-6). Uncertain dedication of financial resources to the system has manifested in a lack of investment in rolling stock, so the system's vehicles do not portray the same presence found with transit systems serving other parks. The transit operator, Via Transportation, operates several styles of buses on the routes. Some have the YARTS logo painted clearly on them, whereas some only have the logo posted over the Via logo and some drivers merely post the YARTS logo as a sign in the window of a bus painted with the Via designation. Sometimes, the poster does not even appear, leaving visitors unfamiliar with the area without the sense of presence of YARTS. To the operator's credit, it allows YARTS passengers on some private operation runs not included in the YARTS contract, so the combined logos on such runs make sense.



Figure 4-6: Yosemite's YARTS buses have an identity crisis with several different appearances.

Frequency of buses factors into the issue of system presence because visitors notice if they see several buses approach a stop in a short period of time. With high frequency, visitors quickly learn to trust that another bus will come for them within a short period of time. Intelligent transportation systems can provide a proxy sense of presence because real-time arrival information gives confidence in the next bus arriving when expected.

4.4.11.3. Media

The spread of information about shuttle service also helps to establish presence. If people see or hear something about transportation service everywhere they turn, they will

come to recognize and discuss it. Information can appear in a number of media. Web site advertising, radio announcements, and other technology currently spread information regarding many of the shuttle systems. Park newspapers often feature shuttle information, though some transit systems have separate brochures dedicated to information on transit, as well.

Distribution of print materials creates presence. If the print materials appear at hotel reception desks, visitor center kiosks, restaurant counters, and store cash registers, then tourists get more than an understanding of how to find the information about transportation options. Visitors also see the degree of local support for the shuttle. A display of information amounts to a degree of endorsement, and visitors unfamiliar with an area often take recommendations from local residents on the best way to experience the area.

- Outside of Zion National Park, visitors can find information about the shuttle in most businesses, and local businesses credit increases in town ridership to the campaign to spread information.
- Zion, Acadia, and Bryce Canyon include shuttle information in the newspaper guides handed to visitors.
- Denali centralizes bus information at the visitor transportation center.
- In contrast, Hot Springs has a low number of trolley information distribution sites, and Yosemite's YARTS does not publish maps for visitors to see how the system fits into the geography of the area. Only a fraction of local businesses around Yosemite provide and display information on the shuttle. Both of these latter two systems have reputations for sparse visitor ridership.

- Cape Cod's Shuttle does not widely distribute information, but cause and effect might be reversed in this situation. High ridership might limit the amount of advertising desired, rather than having advertising used to stimulate ridership.

4.5. Outcomes of Transit Service Initiatives

This section presents the outcomes from transit service implementation in the case study parks. After the planning process creates inputs that generate the service and strategy outputs described in the last section, visitors, riders, and other stakeholders have responded to those outputs to manifest the outcomes described in this section.

4.5.1. Visitation and Ridership

Business people in gateway communities worry about a primary question related to transit: do people stop coming to parks when transit is introduced? If the number of visitors declines while individual spending patterns remain stable, then the number of people spending money in local businesses declines and the local economy suffers. Conversely, if transit causes an increase in visitation, an upswing in the local economy would likely occur. In 1992, Zion visitors reported spending an average of $37 per person at establishments in local communities during the course of their visits (*73*). With visitation at that park counted at around 2.6 million visitors in 2002, surrounding communities can be expected to feel strong economic impacts if transit attracts or discourages visitors. Similarly, a 2002 survey for Acadia National Park showed that 60 percent of surveyed visitors reported spending over $300 (excluding hotel and rental car costs) during their visits (*74*).

The most direct evidence of changes in visitation would come from a comparison of counts of visitors before and after transit introduction; however, changing methodologies for determining visitation makes such comparisons difficult. Although the National Park Service has a large historical database recording the numbers of visitors to parks, changes in visitation resulting from the introduction of transit are difficult to verify because the way visitors to parks are counted has changed.

- In Zion, for instance, total visitation estimates have historically derived mostly from the product of the number of vehicles passing an entrance station multiplied by an observed average number of persons per vehicle (*75*). With the shuttle connection at an entrance gate, walk-in visitors now comprise the majority of the count. The changes in the way people are counted make the accuracy of direct comparison uncertain. Even if the count of people entering Zion had been perfect, the comparison of the number of visitors before and after transit started would be imperfect: local businesses have observed that people riding transit prefer to spend the whole day in the park, rather than exiting at lunchtime and re-entering. With this change in patterns, people who might have been counted twice in a day in their private vehicles are only counted once entering on foot to take transit. Entrance gate crossings before and after the transit introduction are thus different units of analysis.
- Similarly, Acadia National Park measures visitation as the number of vehicles crossing over a sensor on one road on Mount Desert Island (*76*), but the addition of transit shifts the balance. Visitation estimates after the start of transit come

from a greater reliance on multipliers for the expected number of passengers per bus and from less use of multipliers used for private vehicles.

- Bryce Canyon National Park also determines visitation by a private vehicle and bus count (*77*), but with one vehicular entrance to the park, the vehicle count likely has more accuracy than Acadia's.
- Cape Cod National Seashore has multiple entrances, and it counts private vehicles and buses at a number of locations to derive a visitation estimate from respective multipliers. The estimate also includes patrons to a golf course, youth hostel, and other special purpose sites that count visitors using the facilities (*78*).
- Yosemite National Park bases its visitation estimates on five traffic count locations and a count of bus traffic (*79*).
- Hot Springs National Park counts its visitation with traffic counts, an electric eye count of pedestrians on the sidewalk outside the Bath Houses on Central Avenue, and visitors to a medical center; 10,800 visits are added to each monthly count as a constant estimate of the number of people using thermal water jugs (*80*).
- With almost all visitors to Denali accessing the park by bus, Denali National Park calculates its visitation primarily based on bus ridership. Special private vehicle permits, aircraft permits, mountain climbers, and bicyclists also factor into the visitation calculation (*81*).

With parks estimating visitation based on a traffic count, any change in the proportion of people taking the bus will affect the estimation error associated with multipliers for buses and private vehicles. After the introduction of transit, visitation counting methodology might be assumed consistent for subsequent years, which allows visitation to be used for

trend analysis in combination with ridership data. In general, visitation counts can give good general insights, but they do not fully inform the question of the impact of transit.

Table 4-2: Factors Affecting the Number of Trips by Transit

	The number of people using transit	The number of trips taken by people already using transit
Visitors	• Trends in total visitation • The proportion of visitors using transit	• The total amount of time visitors spend in the area • Trends in windshield tourism versus stopping to visit attractions • The amount of time spent at each stop (e.g. hours spent hiking a trail versus minutes spent at each of many stops) • Various trip purposes (sight seeing, trail access, dining, or other trips)
Locals	• Trends in permanent or seasonal population • The proportion of locals using transit	• Various trip purposes (commute, shopping, recreational, or other trips)

As another means of understanding visitor behavior, bus ridership data offer some further information on the question of how visitors feel about the transit service. Total ridership has increased in each year of operation for many of the new systems. Increases in ridership indicate one of two things (or a combination of the two): either more people are taking transit, or the people who take transit are taking more trips by transit. Visitors and local residents have different motivations for changing ridership numbers in these categories (Table 4-2). Factors such as perception of transit service quality, perception of private vehicle congestion, and private vehicle restrictions will affect trip-making for both visitors and local residents. Demographic composition will likely affect both the proportion of people using transit and the number of trips taken per person. Determining

the extent to which these phenomena happen would require a survey of park visitors; however, existing ridership data can show general trends of increasing or decreasing activity on transit systems as gateway community residents and recreational visitors to the parks get more familiar with the systems.

Comparing ridership to visitation provides a useful indication of the proportion of visitors using transit, as well as trends in that proportion over time. Several factors affect the individual measures and the combined relationship of ridership and visitation. Visitation is high when:

- A high proportion of visitors use transit, rather than private vehicles,
- The proportion of visitors using transit remains stable at the same time when the number of visitors increases, or
- The people who use transit take several trips.

Ridership is high when:

- Many people travel to visit the park,
- People visiting the park are entering and exiting the park multiple times each day, or
- The people who are visiting the park stay in the area for an extended visit, entering the park for each of multiple days.

Local parks and communities can establish target levels of ridership based on visitation levels. Tracking the relationship of ridership to visitation will show penetration of transit use into the mode split of local circulation.

General trends after the introduction of transit offer insight into what happens as visitors, parks, and communities grow accustomed to the transit systems. Quantitative

indicators come from park visitation, ridership, and the relationship between ridership and visitation.

4.5.1.1. Visitation

Case study parks and parks throughout the National Park Service have experienced erratic changes in visitation in recent years (Table 4-3).

Table 4-3: Comparison of Total Visitation Change from 1996

	1996 (Base)	1997	1998	1999	2000	2001	2002	2003
Northeast Region	**60,882,641**	**+5%**	**+7%**	**+8%**	**+10%**	**+6%**	**+6%**	**0%**
Acadia	2,957,407	+2%	-4%	-3%	-8%	-6%	-5%	-17%
Cape Cod	4,931,330	-6%	-2%	0%	-7%	-10%	-9%	-17%
Midwest Region	**25,024,925**	**-2%**	**+3%**	**0%**	**-1%**	**-4%**	**0%**	**-3%**
Hot Springs	3,553,557	-2%	-3%	-10%	-13%	-16%	-6%	-2%
Intermountain	**53,922,063**	**-1%**	**-2%**	**3%**	**-1%**	**-4%**	**-6%**	**-5%**
Zion	2,519,901	-2%	-5%	-2%	-3%	-11%	+4%	-2%
Bryce Canyon	1,743,208	-3%	-3%	-7%	-6%	-10%	-21%	-19%
Pacific Region	**61,137,802**	**+2%**	**+1%**	**+1%**	**-1%**	**-5%**	**-4%**	**-3%**
Yosemite	4,190,557	-9%	-9%	-13%	-15%	-16%	-17%	-17%
Alaska Region	**2,677,103**	**+6%**	**+4%**	**+8%**	**+7%**	**+7%**	**+13%**	**+14%**
Denali	341,385	+4%	+9%	+13%	+7%	+7%	+4%	+6%
All Park Service	**399,826,439**	**+5%**	**+9%**	**+9%**	**+8%**	**+6%**	**+5%**	**+4%**

For each park, circles indicate the year of transit service inception or change.

- Acadia and Cape Cod have both experienced low numbers of visitors since 1996 at a time when the Northeast Region of the National Park Service has seen increases. These numbers should not be confused. Cities hold many of the parks in the Northeast Region, such as the Statue of Liberty and the site of the Boston

Massacre. Comparison between urban sites where many people make quick daytrips and rural sites that require vacation planning can be misleading.

- Hot Springs showed a sporadic decrease followed by an increase in visitation, inversely reflecting the changes in visitation in the Midwest Region.
- For Zion, heightened visitation in 2002 occurred against the backdrop of declining visitation in other national parks in the surrounding region, and although 2003 brought a decrease for the park, the park still had a smaller decrease (-2 percent) than the full Intermountain region had (-5 percent).
- In contrast, nearby Bryce Canyon experienced its sharpest drop in visitation in 2002, even as Zion's visitation increased relative to the regional average. The decline in 2002 coincided with substantial cuts in transit coverage and service.
- Yosemite has experienced sharp declines in visitation since its peak years in the mid-1990s against the backdrop of stronger visitation performance in the Pacific Region. The decline in visitation began before transit service started, and many stakeholders attributed declines in visitation to negative media messages about traffic congestion in Yosemite.
- Denali cannot use recent data to indicate changes in visitation from before and after transit service started because this park has used transit for thirty years.

Notably, the parks that have recently started transit service to address traffic congestion have necessarily matured over time, whereas regional and national totals of visitation include the growth of new parks and the additional visitors that naturally come based on expansion of the national park system.

If gateway community stakeholders would like to know if the presence of transit chases away visitors, the data indicate no clear evidence of transit's impact, whether positive, negative, or neutral. A conclusive analysis should use a larger sample size than these initial years of transit service can offer, but even with a larger sample size, isolating effects of transit poses a potentially insurmountable challenge. As identified in the discussion of external factors, many confounding influences affect visitation numbers, making the influence of transit difficult to isolate. Even if transit alone has no impact, perhaps transit interacts with other factors, such as heavy traffic congestion at surrounding recreational areas, to create an impact on visitation.

Environmental consequences of shuttle systems can be expected to have long-term impacts on visitation that will be difficult to isolate. Reduction in vehicle noise and air pollutants improves the quality of visitor experience. Although future surveys might assist in identifying general trends, many visitors might not realize that the absence of a noise or pollutants is what makes a place special for them.

4.5.1.2. Total Ridership

An examination of passenger behavior shows varying trends in ridership for different parks (Figure 4-7). Geographic location could somewhat affect these trends: the two parks in the Northeast Region (Acadia and Cape Cod) both show strong trends of increasing ridership; however, geography does not explain everything, as indicated by the positive trend in Zion and the negative trend in Bryce Canyon. The latter two parks both sit within a few hours' drive from each other in southwestern Utah. With inconclusive results from geography, the ridership data require investigation into individual parks and transit systems.

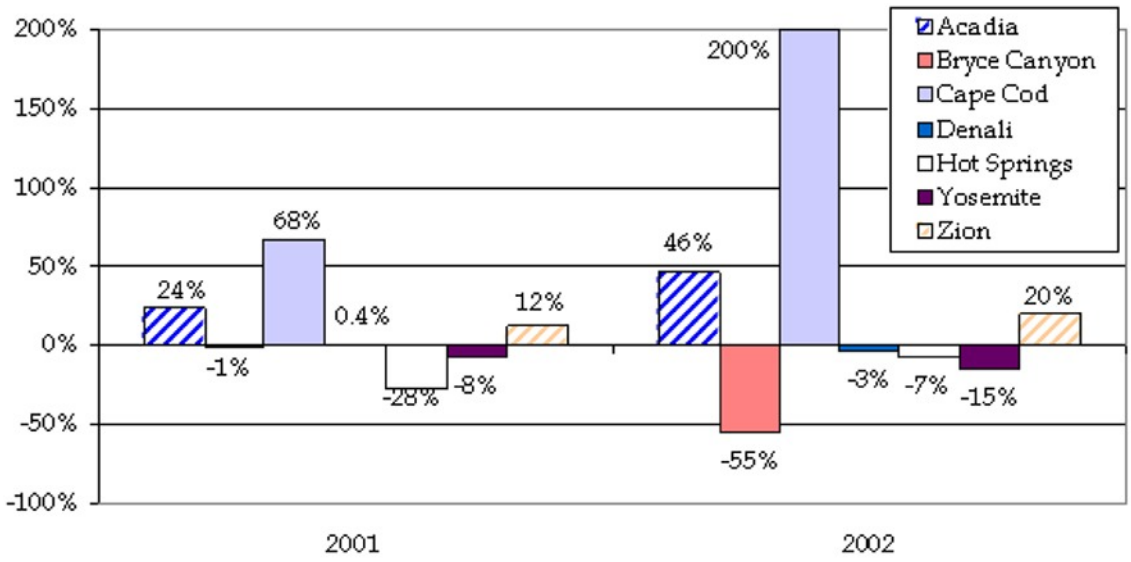


Figure 4-7: Change since 2000 in shuttle ridership for all systems during peak season (June, July, and August).

- As experience with transit grows, people are using the systems more in Acadia, Cape Cod, and Zion. Increasing ridership on these systems suggests that communities and visitors must grow accustomed over a few years to the systems before transit activity becomes a regular part of local transportation. Continuing efforts to improve and disseminate information about the systems should also affect patronage. Demand will reach equilibrium only after familiarity and service support systems mature and stabilize.
- The data for Hot Springs fail to show any clear pattern. In the first year, ridership drops 28 percent, but 2002 marks a large partial recovery. The sporadic nature of this pattern suggests external factors other than the simple existence of transit are coming into play.

- Private vehicle restrictions lead to higher ridership. The data for the Zion Canyon shuttle show millions of riders because people must use the shuttle in lieu of their private vehicles (Table 4-4).

Table 4-4: Transit Ridership over Three Years

	2000	2001	2002
Acadia[3]	193,057	239,971	281,142
Bryce Canyon[4]	334,069	329,834	149,399
Cape Cod	51,375	86,141	102,753
Denali	90,386	90,778	87,487
Hot Springs[5]	37,027	26,800	34,532
Yosemite[6]	22,418	20,680	19,046
Zion	968,528	1,088,724	1,166,089

- When Bryce Canyon's transit system operated at full service levels, it served over a third as many passenger trips as the Zion system did… a remarkable fact, given that Bryce Canyon has not implemented private vehicle restrictions. Some of the effect might come from Zion spillover: many of the visitors to Bryce Canyon come directly from Zion, so visitors who had a good experience with transit in a park where everyone rides might also choose to ride the voluntary service in another park.

[3] Acadia service started in June, so ridership data for this park indicate fewer than three months of service.
[4] In 2000, Bryce Canyon's ridership counting started on June 29th and lasted through September. Bryce Canyon substantially reduced transit service in 2002.
[5] Hot Springs ridership data include the summer months and some special operating days outside the season.
[6] YARTS ceased to offer free passes to concessioner employees, starting in 2002.

- With 4.2 million visits in 1996, Yosemite has the second highest visitation of any of the case study parks (Table 4-3), yet YARTS has the lowest ridership of any system (Table 4-4).
- Over these years, Denali showed a slight increased in ridership, followed by a slightly larger decrease. Compared to the other systems, Denali's ridership reflected stability. This stability could from two likely factors: the longevity of transit operations in the park or the fixed capacity for ridership.

Overall, ridership trends vary. Some systems seem to attract more and more visitors, while others have not managed to attract even a strong base. The existence of transit implies neither success nor failure to lure people from their private vehicles.

4.5.1.3. Park Routes versus Town Routes

Two case studies provide scenarios that draw the distinction between transit activity in parks and circulation in gateway communities. Acadia and Zion both introduced new service with some routes targeting park destinations, some routes dedicated to gateway community locations, and a central connection point between the two.

Town route data for these two parks illustrate the attraction of transit serving gateway communities, and the foil of park versus town data also indicates the effects of private vehicle restrictions on ridership. In Zion, almost 90 percent of total ridership has occurred on the canyon loop inside the park where private vehicles are restricted, but Acadia and Bar Harbor have a much more even balance. Looking at voluntary ridership on the town routes of the Zion Canyon Shuttle, it achieves demand comparable to the voluntary demand of Acadia's Island Explorer (Figure 4-8). Considering absolute numbers, the roughly equal ridership in the two communities (128,219 in Springdale and

147,429 in Bar Harbor in June, July, and August of 2002) suggests that visitors find the two systems equivalently attractive to ride. These two numbers are comparable because the town scenarios are similar. Each town hosted 2.6 million visitors in 2002. Private vehicle restrictions exist in neither town, so each trip taken by bus represents a traveler's evaluation that the bus is the most appealing means of making that trip.

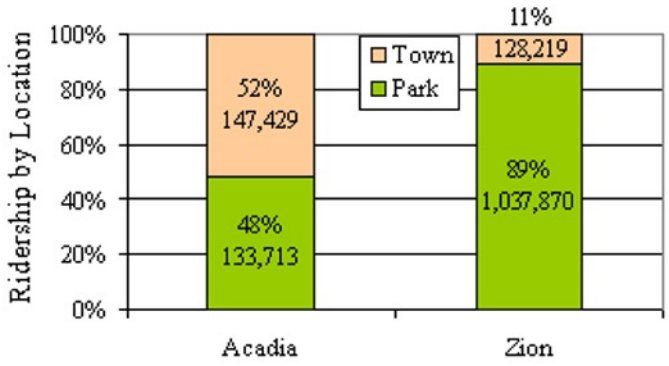


Figure 4-8: Ridership by route location for systems in Acadia and Zion for 2002 (June, July, and August).

The interest of people to ride in the park versus in the town has implications on the way that transit service affects local economies. If visitors choose to ride the shuttles only in the parks, then the flow of people among businesses in gateway communities would be expected to remain unchanged. With an average seasonal town ridership of roughly 138,000 and annual visitation numbers at 2.6 million, a small proportion of people have switched from private vehicles to transit for transportation in the towns. Most people went about the towns as they always have; therefore, visitor access to local businesses has remained largely unchanged.

4.5.1.4. The Relationship between Ridership and Visitation

The extent to which a transit system impacts traffic, visitor experience, and local economies inherently depends upon the extent to which people use the transit system, and vice versa. If no one rides the bus, visitation patterns and spending patterns will remain status quo. If a small number of trips occurs on transit, a small change in spending patterns will occur. If everyone rides the bus, the numbers of people will magnify that small change in visitor behavior to create a large impact on parks and gateway communities. The relationships of ridership and visitation in the case study parks in recent years show a diversity of experience with the extent of use of transit (Figure 4-9); therefore, the extent of impact should vary from park to park. The figure portrays the relationship of ridership to visitation in each park for peak seasons in 2000, 2001, and 2002. The first chart in the figure shows the absolute number of riders versus the absolute number of visitors. The second chart allows comparison from part to park because the chart axes indicate percent change in ridership compared to percent change in visitation. In this chart, the upper right quadrant indicates growth in both visitation and ridership, and the lower left shows decline in both. While no transit systems experienced ridership decline in the midst of growing visitation (lower left quadrant), Zion showed increases in ridership despite decreasing visitation. Again, inconsistencies in visitation counting might affect these numbers.

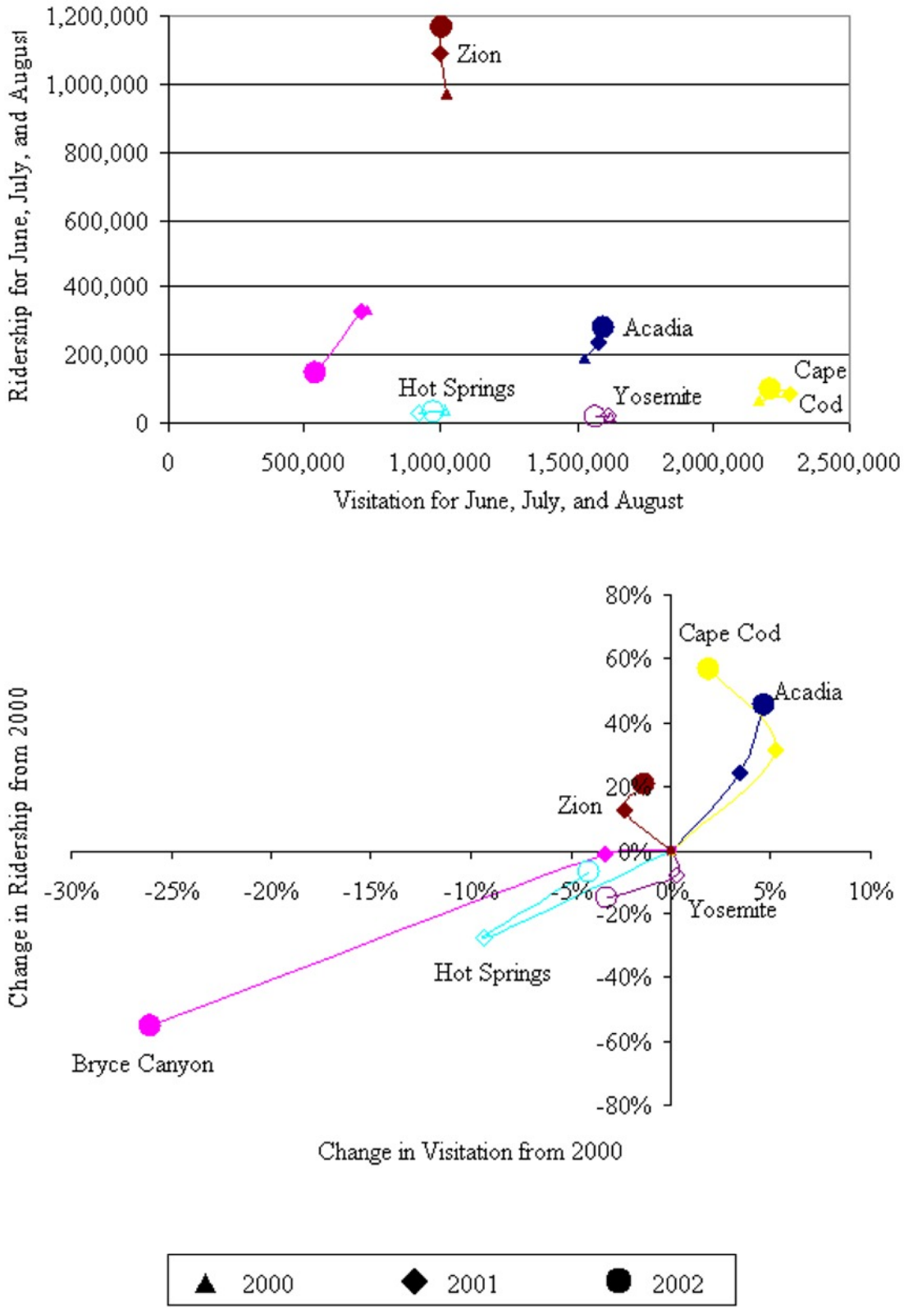


Figure 4-9: Trends in the relationship between ridership and visitation for case study transit systems.

- Zion consistently has the highest penetration of ridership compared to visitation, owing mostly to private vehicle restrictions. For this reason, when Zion moved from a situation where nearly 100 percent of visitors traveled by private vehicle to a scenario in which almost all visitors boarded buses, the case study created the most controlled quasi-experimental environment possible. With the high ridership relative to visitation at Zion, impacts experienced there should present themselves boldly because many people have changed their behavior. In other transit situations with lower ridership compared to visitation, the same impact might occur, but the small fraction of people riding transit would make a lesser degree of impact in the park and local community.
- Ridership relative to visitation at Yosemite has remained miniscule over three years. This miniscule number indicates that people take an infinitesimal number of trips to the park by bus, as compared to private vehicles. Transit has not created a substantial impact on travel patterns, so the shuttle service could not have greatly impacted local economies in terms of visitor spending behavior; however, local communities would have incurred the expense of contributing to service costs.
- Hot Springs has sustained a similarly low ridership level when compared to visitation. With both ridership and visitation decreasing in 2001 and returning to 2000 levels in 2002, trends are difficult to identify.
- Ridership relative to visitation for Bryce Canyon gives an interesting example of choice ridership. The Bryce Canyon Shuttle achieved the highest penetration of transit ridership compared to visitation of any of the voluntary systems, and

although the penetration dropped with the drastic service cuts of 2002, this transit system continued to hold the distinction of the highest level among voluntary systems. Something makes this system unusually more appealing than driving a private vehicle. Bryce Canyon has one park entrance, and many of the primary sites fall along the one bus route. Potentially, although stakeholders indicated heavy traffic at most case study parks, Bryce Canyon with its channeled traffic and close proximity of sites has unusually difficult traffic problems that make people seek transportation alternatives. Bus travel time lasts a half hour from end to end of the route, compared to the three hours of the YARTS system at Yosemite. The relatively short amount of time spent on a bus at Bryce Canyon should appeal to visitors, and most of the stops at Bryce Canyon lie inside the park. More importantly, buses arrive roughly every fifteen minutes, such that visitors do not have to wait long for a ride. Notably, despite the success of the Bryce Canyon Shuttle to attract riders, this transit system has received too few resources to maintain full operations.

- Although Acadia's and, to a greater degree, Cape Cod's transit systems have relatively low ridership in comparison with visitation, the data suggest good performance of the systems in terms of an upward trend in ridership through the years. Though the systems started by attracting only a small number of total trips, transit in these places continues to attract an increasing number of riders.
- Denali National Park did not provide monthly ridership data; therefore, Denali does not appear in this comparative analysis of peak season months.

Local stakeholders might consider a transit initiative worthwhile even if it only attains a small penetration of transit ridership in local circulation because even small reductions in traffic can reduce congestion substantially. Removing ten percent of the cars from a congested roadway might turn gridlock into a slow flow of traffic and might remove traffic circling around full parking lots. Small transit ridership will make a disproportionately large improvement in traffic congestion if the vehicles removed from traffic include a large number of cumbersome recreational vehicles.

4.5.1.5. Summary of Trends

Quantitative analysis of the case study parks clarifies where trends exist and where they do not. The case study parks fail to show consistent trends in visitation since the inception of transit, growing or declining ridership, and the relationship between ridership and visitation. The data do not indicate any clear message that the simple presence of transit affects visitation. Despite the inconclusiveness, these analyses can generate some basic statements of fact:

- The year that transit service started in case study parks never marked the beginning of either an upswing or a downturn in visitation. Where any trends might appear to exist, they started before or after the introduction of transit.
- Private vehicle restrictions raise ridership far above the ridership of parks without private vehicle restrictions.
- Some portion of visitors voluntarily chose transit in every case study.
- Each gateway community can have a different standard of success in terms of total ridership and the ridership level attained in relation to visitation. In some

instances, stakeholders expressed strong satisfaction in systems with relatively small fractions of visitors riding transit.

4.5.2. Rider Characteristics

Characteristics of the typical passenger vary from park to park, although some descriptors recurred in different case studies.

- In Denali, roughly half of all visitors come as passengers on cruise ships without private vehicles, making them a transit-dependent population.

In most other parks, visitors arrive primarily by private vehicle. In these situations, people who stay overnight at lodges served by transit are most likely to take transit.

- Zion stakeholders reported that people initially tended to drive to a parking lot near the entrance to the park, but within the first few years, training of front-line employees and increased experience with transit made a success of the strategy to encourage visitors to leave their vehicles parked at their hotel parking lots.
- In Acadia, around two-thirds of the ridership survey respondents paid for lodging in the area (*82*). As a future expansion of the Island Explorer, transit system organizers will use park-and-ride lots to target day-trippers who live or stay off of the island and drive to visit the area for the day.

Foreign visitors ride transit more readily than Americans, presumably because many European and Asian travelers come from cultures where transit prominently serves daily transportation needs. Several people reported that foreign visitors typically spend more money than American tourists; however, analysts in the case study parks have not examined visitor use data to verify or contradict this observation. If foreign visitors find park transit attractive and it sways more foreign visitors to visit parks with transit, a

propensity of foreign travelers to spend more money would have a positive economic impact on gateway community economies.

Regardless of country of origin, visitors who arrive in park regions with recreational vehicles (RVs) have demonstrated strong support for alternative transportation systems. Difficult winding terrain, unfamiliar roads, and heavy traffic all make popular parks difficult for navigation of oversized vehicles, particularly when drivers have limited familiarity with the area.

- Stakeholders interviewed near Acadia, Zion, and Bryce Canyon all stated that bus stops serving recreational vehicle campgrounds pick up large numbers of passengers because guests would prefer to leave their large vehicles parked.
- As planning discussions of the shuttle proposed to run between Denali National Park and its gateway community began, RV campground operators came to the table first to support the concept.
- At Hot Springs, some stakeholders identified that a large number of people break out tents and need transportation at the Gulpha Gorge recreational vehicle campground, which the trolley does not yet serve.

Acadia had identified a different transportation problem with campgrounds: single groups bringing multiple passenger cars to give mobility to all members of a camping group. The Island Explorer has mitigated this traffic contribution by providing mobility through alternative transportation.

Ridership surveys in Acadia National Park gave some of the most detailed information available on the trip purposes and characteristics of riders (Table 4-5). Ridership data indicated people split evenly between park and town shuttle routes, but

reported trip purposes showed that roughly 65 percent of riders each year have used the shuttle for the purpose of outdoor recreation or sightseeing, which presumably involves visiting park lands. Consistently, about one fifth of the riders have used the shuttle explicitly for the purposes of shopping and dining. The proportion of people using the bus to commute to work has hovered each year between five and eight percent, even while ridership has grown, which suggests that the absolute number of people commuting on shuttles has grown over the first four years. Cape Cod and Yosemite also report consistent commuter ridership.

Table 4-5: Trip Purposes of Shuttle Riders at Acadia National Park (*82*)

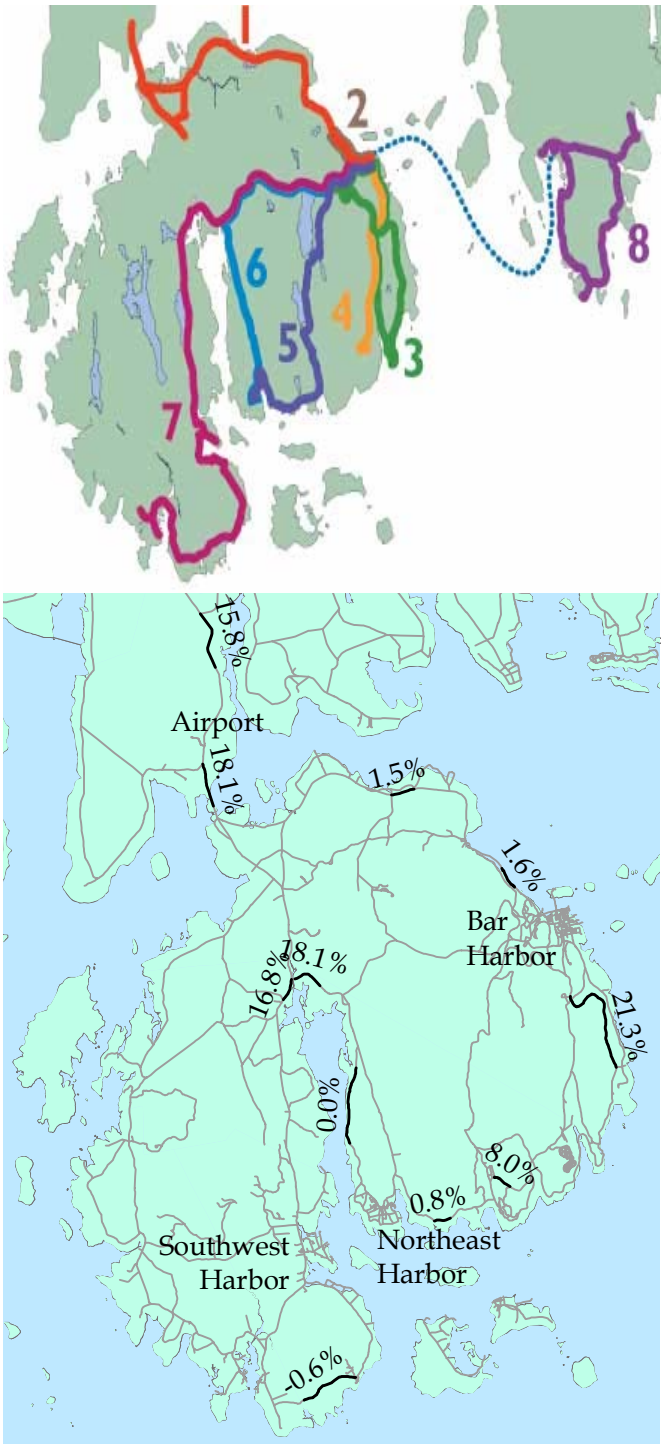
	1999	2000	2001	2002
Work	5%	7%	5%	8%
Shopping	12%	11%	12%	15%
Dining	7%	11%	7%	8%
Outdoor recreation	30%	28%	30%	30%
Sightseeing	37%	35%	37%	32%
Other	9%	8%	9%	9%

4.5.3. Traffic Congestion

Typically, parks with high visitation deal with long queues of cars at entrance gates and traffic circling around major park attractions. Gateway communities experience peak traffic around meal times in restaurant districts. People unfamiliar with local streets drive distractedly while trying to determine what restaurants or other businesses to patronize, creating slow traffic and safety hazards. On Cape Cod, for example, the local shuttle runs on one-way narrow streets in Provincetown where cars mix with thick crowds of

pedestrians to create heavy traffic congestion. Does transit serving parks and gateway communities alleviate traffic problems?

Traffic count data sampled during the peak season by the Maine Department of Transportation provide evidence that transit helps reach the goal of reducing local traffic in certain concentrated areas. Between 1996 and 2001 (before and after the expansion of shuttle service in and around Acadia National Park), traffic count stations showed increases in annual average daily traffic on the major roads of Mount Desert Island. Traffic leading onto the island from the mainland increased 15.8 percent, and the one road directly accessing the island, which also includes surface traffic from the Bar Harbor – Hancock County Airport, saw an 18.1 percent increase. Major thoroughfares across the island realized traffic changes comparable to the island access roads. The Park Loop Road saw a 21.3 percent increase, and on the primary link between the east and west sections of the island, traffic rose between seventeen and eighteen percent. Roads in Northeast Harbor that carry more local traffic than tourists saw negligible increases of less than one percent, and one of the most remote parts of the island south of Southwest Harbor saw a decrease in traffic. Along the highest-demand routes for transit on Mount Desert Island around Acadia National Park, traffic increased only 1½ percent, compared to 20 percent increases elsewhere on the island between 1996 and 2001 (Figure 4-10).



Data for this analysis came from Maine Department of Transportation annual traffic volume counts. Traffic counter locations depicted on the map are approximate.

Figure 4-10: Acadia's traffic grew substantially except on highest demand transit routes (routes one and two).

Whereas Acadia has shown that transit can help reduce existing traffic congestion, Denali National Park acted proactively in the early 1970s before the park had a chance to experience traffic congestion. With the exception of rare occasions when park access has been opened to private vehicles, internal park roads have never seen traffic congestion; however, growth in visitation and access to the region has brought traffic to areas just beyond the primary shuttle routes. Transportation planners and engineers are working to solve major problems on the outskirts of the park. Near visitor facilities now under construction and the train depot that brings half of all visitors to the area, road engineers have built a traffic circle inside the park to handle a five-way intersection. Outside the park where commercial development has concentrated, a number of pedestrian fatalities prompted the Alaska Department of Transportation to reduce speed limits from maximum highway speeds to levels more befitting commercial areas, and local residents and political representatives have worked with the transportation agency to develop a plan to pedestrianize the area, including building a foot bridge over the river to create direct pedestrian access to the bus depot in the park without forcing people to walk along major thoroughfares. One could argue that until such car-free access and amenities are achieved, the transit system has displaced and changed the nature of traffic problems, rather than eliminated them. Providing for the safety of people where they walk in the community and access transit in the park will help realize the vision of orderly movement through alternative transportation in and around the park.

4.5.4. Commuters and Local Employment

Interviewees in several case studies reported that even though the shuttles were intended for tourists, local residents use the buses for all types of trips, including

commute trips. This travel behavior should be encouraged because it helps reach identified goals of transit: it reduces traffic congestion and its associated safety hazards, frees parking spaces that would otherwise remain full all day, and reduces noise pollution and local emissions harmful to air quality. The transit service also produces a societal benefit: it provides access to jobs for people who do not own or use private vehicles. Gateway communities appeal to two primary demographic groups with potentially limited mobility: retirees and students. Both of these groups gravitate toward seasonal work in or around parks. Notably, elderly and young drivers also pose the greatest safety risks on roads (*83*,*84*), so creating communities where these groups do not need private transportation can benefit society in multiple ways.

In many parks, commuters form a stable core part of transit ridership, although this core might be a small portion of total ridership. Why would commuting employees find transit in parks and gateway communities appealing? They see the traffic on a daily basis, so they know to expect traffic problems in central locations where they need to go. Commuting employees also have familiarity with the system and understand the predictability of schedules, whereas visitors might feel intimidated with an unfamiliar system and a limited number of days to spend in a recreational area. The YARTS system outside Yosemite offers seasonal passes for commuters and tracks distinct ridership counts for commuters and visitors, showing employee ridership on par with visitor ridership in the early years (when National Park Service and concessioner employees received free commuter passes) and a smaller, but steady, commuter ridership since late in 2001after concessioner employees stopped receiving free passes (Figure 4-11).

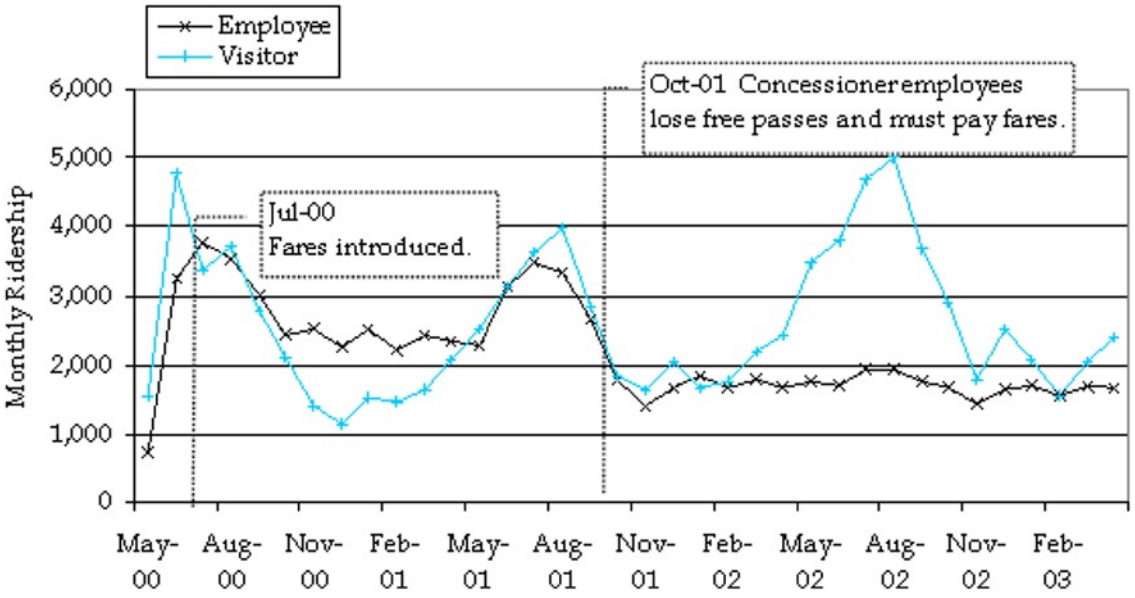


Figure 4-11: For YARTS service at Yosemite, commuters comprise a substantial portion of total ridership (*85*).

Understanding the benefits of using park transit for commute trips, some transit system organizers are working to develop the commuter ridership base.

- At Cape Cod National Seashore, many of the seasonal employees of the region cannot afford the cost of housing on the outer cape, so particularly foreign seasonal employees without private vehicles live in campgrounds during the summer season and depend on shuttle service for access to jobs.
- Partly motivated by the need to transport workers, the Magic Springs amusement park arranged to have the trolley route serving Hot Springs National Park extend to the amusement park as part of its deal to locate in Arkansas near Hot Springs.
- Planners for the Island Explorer at Acadia National Park feel that developing commuter ridership will reduce the number of workers' cars parked all day

outside employment centers, freeing parking for visitors and mitigating the overall parking problem. Several stakeholders see potential there for developing express bus service to major local employment centers at peak commute times.

In all of these cases, transit system organizers are acting on the sense that the development of commuter ridership will indirectly benefit visitors and park resources, even if commuter ridership directly serves the local population (permanent or seasonal) in gateway communities, rather than park visitors or even employees of the National Park Service and its official concessioners. Stakeholders in Zion, Bryce Canyon, and Denali did not demonstrate the same strong sense of commuter ridership. Shuttles in Bryce Canyon and Denali do not run near residential areas; therefore, low commuter ridership makes sense.

4.5.5. Transit Employment

Undeniably, new transit service opens new opportunity for employment in transit operations, but transit in parks seems to run a spectrum of appeal for potential workers. Buses need drivers to operate them, mechanics to maintain them, and managers to dispatch and handle them.

- For Zion, the surrounding area had few residents with commercial driver's licenses or skills for driving buses before the Zion Canyon Shuttle started operations. The transit operator assumed the responsibility of training drivers in the local community. As an incentive, drivers' wages surpass the county average because they adhere to the federal wage rate, due to the role of the National Park Service, as a federal agency, in service provision. Despite the seasonal nature of most of the jobs created and some drivers coming from out of the area, 60

positions at an above-average wage in a town of 391 people substantially impact local employment. The Zion Canyon Shuttle offers an opportunity to earn above-average wages and gain new skills. The transit operator has low employee turnover and tight competition when positions come available.

- In the same state and region as Zion, the shuttle operator for Bryce Canyon National Park also trained local residents to drive its buses. When the scope of shuttle operations was reduced to cut costs, the transit operator put a priority on keeping local employees on staff, rather than the people who might travel to the area for seasonal employment. The operator, which is based out of Salt Lake City, further helped the local population around Bryce Canyon at the time of the 2002 Olympics in Salt Lake City by hiring drivers of the Bryce Canyon Shuttle to drive for the one-time off-season event. The training and the federal wage rate have both helped local residents around Bryce Canyon National Park, although one nearby employer claimed that his business loses its opportunity to hire the best local workers because gateway community businesses cannot compete with the federal wage rate, which is not solely determined by the local market.
- In Denali National Park and Preserve, government wages were not sustainable in perpetuity. Denali had operated its shuttle service for over two decades, but a few years ago, park administration decided to privatize the service to cut costs. Transit operations became a part of the concession contract for the park, so private market forces took a larger role in transit management. The drivers, some of whom had operated buses and built their incomes on this career for two

decades, took a substantial pay cut. The employees unionized in 1997, and relations between management and the union remain somewhat contentious.

Compared to the high demand for driver positions in the southwestern parks of Zion and Bryce Canyon, the laws of supply and demand created a different story in the northeast.

- With a denser population and a more transit-oriented culture in New England, the transit operator for the Island Explorer serving Acadia National Park found skilled and licensed drivers available in the region. In this case, the shuttle brought 47 employment opportunities to an already skilled workforce of drivers. The Island Explorer offers work with a roughly average income, paying better than other bus operators but less than the average wage in the local tourism industry.
- On the far end of the spectrum, the Provincetown-Truro Shuttle on Cape Cod cannot fill its jobs in an environment with a notoriously high cost of living.

Overall, park transit operators are providing employment in gateway communities, and most operators demonstrate sensitivity to trying to concentrate the benefit of their employment offerings to the gateway communities. Federal wage rates bring above-average income to local residents, but the story in Denali raises the question of how long those wages can be sustained. When budgets get tight, management needs to turn to the efficiencies of privatization to cut costs, which push driver wages down toward market rates. On the one hand, gateway community residents can enjoy the benefits of the resources dedicated to starting new transit systems, including federal wage rates. On the other hand, Denali's case has shown that drivers grow accustomed to receiving the higher wages, and cutting those wages breeds ill will. As a third angle, the experience on Cape

Cod shows that without incentive to take these transit jobs, such as a high wage rate, local residents might choose other employment, leaving transit operators struggling to find drivers. Where gateway communities sit in closer proximity to other transit systems, the employment question might not create much noticeable impact. Both the Hot Springs trolley and Yosemite's YARTS operate in conjunction with other bus services (regular transit service in the city of Hot Springs and Via's own private operations, respectively), and transit operators use drivers between the two systems interchangeably.

4.5.6. Local Business Impact

The question of transit's impact on business surprised many participants in interviews for this research, but it also deeply interested them. People tended to have limited awareness of the issues associated with the economic impacts of transit. Many people had not considered what impact transit had had on their businesses, but reflection helped them to derive some answers or realize what changes they had observed in the way visitors dealt with local businesses. Participants closely involved in transit planning often showed a keener awareness of the importance of the issue.

Gateway Community Businesses: Zion National Park offered the most controlled environment for examining transit's impact on businesses. With the introduction of transit in the most heavily traveled part of the park, the National Park Service implemented private vehicle restrictions in the park, which moved most visitors out of their private vehicles and onto the buses. With a small area to cover and few businesses to serve, most businesses in Springdale, whether large or small, sit in close proximity to transit stops. All businesses have roughly equal access to transit service, but different industry sectors have felt different effects. As mentioned in the discussion of private

vehicle restrictions, the visitation pattern in and around Zion has changed such that people stay in the park through lunch hour, rather than going into town to eat. Restaurants and retail shops in town have lost business at midday; however, the dinner crowd has grown and moved later in the evening. Some restaurants see the increase in the dinner crowd as an economic benefit because the bigger meal at dinner time brings more revenue. Retail stores give mixed reactions overall. Some shop owners say that the shuttle bus has taken all the visitors out of the town and hurt business. Other stores have shown no performance changes since service inception. Several potential opportunities appear to have emerged for entrepreneurs in the service industry. With reduced traffic in the park, demand for bicycle rentals has increased. Because pets are not allowed on the buses, local businesses are struggling to meet strong demand for high quality pet boarding. In the lodging industry, businesses hope to see that the longer amount of time people are spending in the park and on the trails will manifest in guests staying for an extra night, though business performance has not yet demonstrated this change.

In Acadia, the Island Explorer has particularly served large lodges and campgrounds with front door service provided for annual fees of $500 to $2,000. While the large lodging businesses both pay for and receive direct transit service, the signature New England small bed and breakfast establishments and local salt water taffy shops do not benefit as much from the existing system design. Mostly large businesses and businesses on the eastern part of the island report that their customers use the shuttle system, while small businesses report lower use by customers (*86*). Although customers can reach small business along bus routes by flagging a bus to stop, few people use the

flag stop system, and no bus route circles downtown Bar Harbor to reach the cluster of small businesses there where some of the heaviest crowds and traffic congestion occur.

Bryce Canyon went to the other extreme to help small businesses when it went out to bid for a contract for parking. A single family owns the largest lodge outside the park, as well as many other nearby businesses. Operationally, bus service would fit most efficiently in this area; however, serving only the largest business in the gateway community would have disproportionately given benefit at the detriment of smaller operations. The parking contract allowed another business enterprise to benefit from the shuttle system. In general, though, the land use around Bryce Canyon has businesses and commercial areas too sparsely located to serve them efficiently with transit and aid in their economic development. Local business organizations and planners need to work together with the park to create transit-oriented development to reap economic benefits from the service.

Businesses around Acadia reported they felt no direct economic impact from the Island Explorer. The prevailing sentiment in stakeholder interviews also held that traffic levels had not improved with the operation of the shuttle. Several people said that with traffic at the same level, the shuttle has merely increased the capacity of the town to handle tourists. Traffic data support this hypothesis (Figure 4-10); however, the overall reasoning does not follow a logical progression. If traffic levels remain steady while the shuttle brings more people to town, then unless spending patterns have drastically changed, the increase of visitors in town must also increase revenue for town businesses; furthermore, local chambers of commerce have found they can use the Island Explorer as a selling point to convince people to visit the area (perhaps particularly for foreign

tourists from transit-oriented societies, who, as noted earlier, are reputed to spend more money than domestic tourists do), which suggests that transit increases the potential customer base for local businesses.

Data do potentially corroborate the assertion that shuttles do not improve business revenue in one important regard: business capacity. Many businesses, such as lodges and restaurants, around Acadia largely report that they operate at full capacity in the summer season of July and August when the Island Explorer has traditionally run. If the businesses already operate at capacity, the Island Explorer service cannot attract new customers. It can only help businesses in the peak season if they raise their rates, which could be seen as a disbenefit to visitors, or if businesses can find a way to increase their capacity to serve more customers. During the spring and fall shoulder seasons in June, September, and October, businesses operate at about 75 percent of capacity (*86*). With the 2003 extension of shuttle service into the shoulder season, businesses now have opportunity to start evaluating if Island Explorer service attracts customers to businesses with direct service.

Like Acadia, businesses in Provincetown on Cape Cod operate at capacity through the peak season. Stakeholders there saw the shuttle as a means of reducing traffic congestion, but the question of economic impacts received no particular response.

Gateway communities around other parks have also expressed mixed feelings about resulting economic impact.

- Around Hot Springs, business owners have a mix of opinions. Some would like to see the trolley disappear to save public funds. One business owner speculated that people might ride by his store on the trolley, rather than walk into his store to

partake of his goods. Other business owners have fought political battles to keep the trolley, saying it provides a signature character to the tourism area.

- Businesses served along YARTS routes reported little effect on their businesses and few people asking about the service; however, several businesses believe that the transportation situation there needs to change, so they provide bus schedules.

Outside Denali, some unusual effects of transit have appeared in the nearby commercial area. With half of the people arriving in the area by train, a new car rental business has experienced unexpected growth. The business started as a means of letting a few seasonal employees run errands on weekends, but demand quickly grew as tourists expressed a desire to see more in the area than the national park where the buses would take them. Another effect relates to the central decision-making of bus operations. For people going into the national park, a simple snow shower on the unpaved road can stop all operations for a day, which sends almost the full complement of intended passengers into the local area and local shops.

Private Transportation: Tour Buses and Taxi Cabs: Most transit supporters and planners feel that shuttle service poses no competition to the private transportation industry. Transit system organizers generally see shuttles as a different type of service because they provide transportation with no interpretation of local attractions, whereas tour service offers the product of local knowledge and research. Visitors might see the situation differently, as demonstrated in Acadia, where over a third of shuttle riders use the free service for sightseeing (*82*). In many cases, the difference between a tour and a shuttle comes with the degree to which drivers talk about the area, but visitors ask questions of shuttle drivers, and the drivers typically respond. On the other hand, cruise

ship operators sell Acadia bus tour packages to passengers before arriving in port, so many of passengers do not know about the Island Explorer. To protect tour bus operators, many shuttle services reserve some roads only for private access. As examples, visitors need private transportation to access Cadillac Mountain in Acadia and Provincetown's airport outside Cape Cod National Seashore.

Private transportation providers give mixed reactions. Most operators seem to recognize the need for shuttles in congested areas. One tour operator reports park transit has had a negative impact on the bottom line of his local tour bus industry, saying that shuttle drivers do talk about the area to their passengers, removing the competitive advantage of interpretation on tours. Operators recognize that interpretation occurs on shuttles, taking away the private-market edge, but the same people realize that shuttles give access to more visitors. In some cases, private operators cannot determine if the difference between lost customers and expanded customer base produces a net positive, negative, or neutral effect on the bottom line.

Concessioners inside Parks: Businesses inside parks run on concession contracts with the National Park Service. For parks with private vehicle restrictions, almost all customers of businesses inside the parks must travel to the businesses by bus.

- As mentioned in the discussion of private vehicle restrictions, the concession operations in Zion National Park felt the change in travel patterns from nearly total access by private vehicle to nearly total access by transit. Although the concessioner who runs operations in both Zion and Bryce Canyon did not participate in this research, other interviewees reported second-hand that restaurant operations had increased inside Zion National Park in the lunch hour

because people riding transit preferred to stay in the park instead of exiting and re-entering on the bus. The concessioner started new short-order food service for outdoor eating to accommodate the large crowds at lunch. Whereas lunch demand in the park increased, people generally opt to go to town for the evening, reducing dinner traffic at the Zion Lodge Restaurant. Retail sales have reportedly decreased because people are not willing to carry their souvenirs with them on the buses and on the trails. Trunks on private vehicles formerly provided secure storage for purchases. Although the concessioner has tried offering free delivery to the park entrance, people still think twice before making impulse purchases.

- Based on the experience at Zion, Acadia's concessioner anticipates losing retail sales if and when roads in that park fall under private vehicle restrictions; however, the experience of Zion needs to be considered in the context of that park. Acadia's concessioner's retail sales location is located well inside the park, as in Zion, but the operations in Acadia are already geared toward shipping products because many customers come by bicycle, and many visitors arrive in the area on cruise ships. In contrast, Zion's concessioner always had a customer base accustomed to parking private vehicles in the parking lot at Zion Lodge. The experience of one park does not necessarily indicate what will happen at all parks.
- Hot Springs also might provide another counter-example to the experience of reduced retail sales where buses serve internal shops. The Tower Gift Shop on the mountain reports that roughly a quarter of its customers arrive by trolley.
- In Yosemite and Denali, concessioners operate transit service; therefore, transit poses economic opportunity to them.

4.5.7. Economic Development Impacts

The importance of economic development related to parks extends beyond local gateway communities. In many cases, states depend on national parks to attract large portions of state tourism revenue.

- Hot Springs National Park stands as the largest tourism attraction for Arkansas.
- Similarly, the region around Acadia National Park accommodated 28 percent of all people who took overnight marketable pleasure trips to Maine in 2001 (*87*).

Several gateway communities have found ways to use transit service as a means of promoting economic development for local areas. These economic development initiatives have taken many forms, such as creating new ways to attract tourism dollars, directly working to meet business needs, or allowing growth within local development policies geared toward protecting environmental and community character.

- On the east side of Yosemite National Park, Mammoth Lakes acts as a tourism destination of its own, but local entrepreneurs have connected with the YARTS system as a means of extending the amount of time visitors spend in the area. The trip from Mammoth Lakes to Yosemite takes four hours in one direction, but resort community marketers are selling the idea of a day trip to the park on the shuttle with a return to Mammoth Lakes for another night at a local lodge and a meal in local restaurants.
- Even though local leaders and economic developers around Hot Springs National Park emphasized in interviews how little impact the trolley has had on their community and local economy, this alternative transportation clinched a deal to attract a major employer to the area. The developer of an amusement park, Magic

Springs, would only agree to locate outside Hot Springs if the City would guarantee trolley access. The trolley operator added Magic Springs to the route serving the national park, and the developer built the amusement park, which received 360,000 visitors in the first year. This new business expanded recreational opportunities and added to a growing trend in the region of improvements in the local economy. Furthermore, a large part of the economic development plan for the region targets attracting retirees with their retirement incomes to live in the area and take advantage of the health benefits of the area's waters. Although local leaders did not raise the issue of transportation for the elderly, transit will likely grow increasingly important as the currently young retiree population ages. An older population cannot walk long distances and loses the ability to drive private vehicles safely, making public transportation services a necessity for mobility, thus the bus system serving the park and the community will likely grow in importance as a result of the economic development strategy to attract retirees.

- The Bryce Canyon Shuttle has provided opportunity for a landholder to develop property into a dedicated parking facility with guaranteed income for the duration of the transit contract; however, with the secluded nature of this parking facility, smaller businesses do not have opportunity to take advantage of pedestrian activity around the park-and-ride location.

Beyond attracting new markets and employers, shuttle systems provide potential for expanding existing business where local regulations or conditions prohibit new growth.

- Outside Acadia, minimum parking requirements do not allow businesses to expand beyond the capacity of their current parking lots, and environmental concerns limit the appeal of expanding parking. Transit creates a means of reducing parking requirements for businesses with bus access.
- The community outside Zion developed along a linear state highway traversing a narrow canyon with limited space for expansion. Again, access by transit offers potential for further business growth. In this case, the town has made a policy of "providing infrastructure, services, facilities, amenities and alternate modes of transportation to enhance the lives of [its] residents and the experience of [its] guests (*88*)." This town has incorporated transportation by bus into its plans for future development, which will encourage clustered transit-oriented development, rather than linear growth accessible only by private vehicle.

Whereas many small gateway communities grew along road corridors and local leaders cannot imagine anything other than access solely by private vehicle, commercial development around Denali has demonstrated that complete gateway communities can emerge where at least half of all tourists travel without private vehicles. In a canyon immediately outside the entrance to the park, a cluster of businesses has risen with large lodges, restaurants, gift shops, and service industries (Figure 4-12). With its reputation for targeting sales to tourists, the canyon earned the nickname Glitter Gulch with an implication akin to the commercial riches of Las Vegas. The development in the gulch differs somewhat from development in other gateway communities. Local businesses provide private shuttle services to the train depot and the park visitor center. With people accessing local resources only on foot or by bus, the transit-dependent tourism base has

forced businesses to cluster close to each other, making business location perhaps even more economically important than in auto-oriented communities. Business people consider this canyon so lucrative that they have developed all available land. In the last two years, one lodge alone expanded from 150 rooms to 430, and just when locals believed no further development could fit in the space, another lodge appeared up the hill in a topographically unlikely place.



Figure 4-12: The transit-oriented development in the canyon at the main entrance to Denali National Park and Preserve has economically thrived.

4.5.8. Local Parking Fee Revenue

Parking provides revenue for local governments in two forms: enforcement fines and lot or meter fees. Because introducing transit in gateway communities changes parking patterns, changes to these sources of local income could also be expected to occur.

Heavy parking demand in Provincetown on Cape Cod fostered a lucrative revenue collection situation. Municipal parking lots charge a flat fee of twenty dollars, and little parking is available in the town outside the designated lots. When the Provincetown-

Truro Shuttle began operations, municipal parking revenue went down by $30,000 per year, while revenue from parking enforcement remained stable. The Town recognizes this negative impact on its budget and accepts the decreased revenue as an annual cost of providing the necessary shuttle service.

In contrast to the Provincetown situation where parking revenue had always existed, Bar Harbor, a gateway community of Acadia National Park, is examining the changing nature of local transportation to determine new means of revenue generation. Recognizing shifts in local parking behavior and seeking means to gain revenue to cover shuttle operating costs, Bar Harbor commissioned an alternative revenue task force report. The task force studied the town's parking situation and recommended imposing parking fees on town lots. The task force anticipates $619,472 in annual revenue if the town adopts the parking fee program.

No other case study site representatives indicated intention or consideration of collecting money for parking revenues related to transit service.

4.5.9. Public Reaction

The National Park Service works with two different publics: the visiting public and local residents. For most national parks, the visiting public comes primarily from the region within a one-day drive, and nearby metropolitan areas typically contribute the largest number of people to this public. The visiting public also extends nationally and internationally. Local residents include people who live nearby and perhaps have stakes in local businesses (seasonal residents act more like local residents than like the visiting public in many ways). Major park actions, such as the introduction of transit, largely impact the way of life for local and seasonal residents. Local stakeholders include local

leaders of government and business, as well as citizens who take an active and involved interest in local affairs. Either or both of the publics can act as a powerful force for facilitating or blocking transit operations, so public reaction to transit influences the ultimate impact of park transit systems and their degree of success in achieving their goals, such as economic growth.

Common to newly implemented park transit systems examined in this research, local residents declared they initially held reservations about how transit would fit their communities. The people did not feel certain it would work in their environments… "not until we saw it running."

- Communities around Zion and Acadia had no substantial local experience with transit, so dedicating the substantial resources needed for startup required a leap of faith and a willingness to take a risk on the part of local residents who depend on tourists enjoying their experience when they visit. Transit systems for both of these parks and communities hit a few minor bumps during startup, as could be expected, but local residents grew appreciation and enthusiasm for the systems.
- Even though stakeholders near Denali National Park and Preserve have three decades of experience with transit, many people expressed anxiety over new discussions of creating a unified transit service between the gateway community outside the park and the transportation center.
- Acadia's field operational test of intelligent transportation systems (ITS) received similar skepticism and an equivalent reception in this study's findings and in other research. Businesses surveyed before the system installation expressed skepticism that business customers would use the system, so businesses did not

consider disseminating information about the system a high priority. In contrast to the local residents' cynicism, the visiting public quickly took to the technology. Of riders surveyed in 2002, 80 percent of 434 respondents had decided to take transit based on the real-time departure signs they saw, and 80 percent of system users said the technology saved them time (*74*). Despite the initial negative reaction of the local public to the transportation technology, the reaction of the visiting public… once again after they "saw it running…" increased bus ridership and therefore increased the potential for transit to achieve its goals and increase its impact on the area. In this case, education of the local public on what the system could do and how it could help its customers use the system would have helped gain support at start-up.

Whereas Zion and Acadia stand as two of the strongest models for transit implementation in national parks, some of the more troubled systems have had problems with public reaction after implementation.

- In Hot Springs, a stakeholder responsible for communications to tourists reported that people do not think the trolley is important and that it is not a key selling point for tourism. Such thinking creates a circular pattern: if the trolley is not considered a selling point, it is not sold, so few people know about it and use it. As fewer people use it, it receives fewer resources and becomes less of a selling point. On the positive side, people consider the trolley serving Hot Springs equally appealing across all demographics. This attitude toward the trolley contrasts the image of regular bus transit in that city, which residents perceive as appealing only to the low-income population.

- Whereas the operator of Yosemite's YARTS system reports strong and loyal ridership, local residents perceive the buses always run empty of passengers. Several factors might contribute to this perception. The physical design of the buses does not allow easy viewing of passengers from the streets. With tinted windows and seats high off the ground, passengers might not be easy to see, particularly physically small passengers like children. Furthermore, the depot for the YARTS system is located in Merced at the furthest location from Yosemite National Park, whereas some of the bus runs start or end in Mariposa, roughly halfway between Yosemite and Merced. Drivers routinely drive empty buses... a practice called deadheading… between the start or end point of their routes and the depot. From the street, these deadheading buses look like a failure of the system to attract riders, so the general public holds the negative opinion that the bus system attracts no riders.
- Where Bryce Canyon had (and to a large degree still has) local support for transit service, the local community now has a sense of a lack of consistency in policy. Transit service initially started with several routes and a dedicated parking facility, but financial difficulties forced cuts in the service. The transit operator reduced route coverage in the park. The dedicated parking facility went in service for the first years, went out of service one year, and went back in service the next year. These inconsistencies arose in response to the changing financial situation. Adjustments to service will happen with any system, but transit system organizers at Bryce Canyon have had to deal with more than the typical number of changing circumstances. In this situation, open communication must occur to explain to the

public what has changed in the situation, the decision criteria used to choose a response, and the response chosen.

As public reaction changes, so goes general support of systems. Local opinion of transit will resonate in the attitude portrayed to the visiting public.

An informed local public is most likely to support a system locally; otherwise, transit initiatives might encounter local political resistance. Citizens form opinions to express to their elected representatives, and elected representatives vote on the resources to allocate back to the transit systems. Where perception problems exist, transit system organizers need to address them. Communities with no prior experience with transit will have reservations, so information on the experience of other parks and gateway communities can be helpful.

- Stakeholders in Cape Cod started supporting the campaign to start the Provincetown-Truro shuttle after hearing about the experience in Acadia.
- In the case of perception of empty buses, as in Yosemite, limiting deadheading, displaying “out-of-service” signs, or advertising bus load factors can help correct incorrect perceptions.

Where people perceive inconsistency, communication is a necessity. Overall, transit proponents need to take public reaction seriously and address it as an important facet of transit planning. Education and dissemination of information offer the best means of helping both the local and visiting publics understand and respond favorably to service design and operations. As understanding grows for well-designed and managed transit systems, public support will grow, as well.

4.6. Summary

Research results appear within the framework of inputs (planning and funding), outputs (transit service and related programs), and outcomes (manifestations in terms of circulation changes, economic impacts, and so forth).

4.6.1. Inputs of Planning and Decision Making

The **goals** of transit vary from system to system, but the case study research identified several primary goals for park transit, namely:

- Improvements in traffic, parking problems, and perceptions of crowding
- Increasing safety associated with motor vehicles
- Mitigating environmental impacts from motor vehicles

Other typical goals identified in a 2001 comprehensive national study of transit needs for federal lands include (66):

- "Enhancing visitor mobility and accessibility;
- "Preserving sensitive natural, cultural, and historic resources;
- "Providing improved interpretation, education and visitor information services;
- "Reducing pollution; and
- "Improving economic development opportunities for gateway communities."

Design and implementation of transit service follow from goals, and the impacts of transit depend on how transit is implemented. Outputs, such as service scope, derive directly from the goals of the planning process and affect ultimate outcomes.

Partnering provides support and financial contributions for transit systems, and strong partnerships appear to correlate with high ridership on shuttle systems. Because

gateway communities typically contribute to support local shuttle service, **transit finance** strategies affect their local economies.

- Most local stakeholders initially do not realize that **fare revenue** will not pay for transit. Given that shuttles require subsidies, some communities have decided to give full subsidy and eliminate fares because experiments with park transit systems have shown that fare-free systems attract more riders, helping achieve the greater goals of transit. As a contrasting fare strategy, some system organizers recognize that introducing fares to a historically fare-free system disgruntles the public, so if fares are anticipated in the future, putting fares in the initial transit plan makes sense.
- Parks contribute money from their **entrance fees**, and special legislation now allows parks to tack a **transportation fee** onto their entrance fees. Whereas part of entrance fees goes to the National Park Service in Washington, D.C., transportation fees pay strictly for transit. Transportation fees work well when people pay entrance fees, but experience has shown that visitors who present annual passes in lieu of entrance fees will not willingly pay transportation fees.
- Introduced in 2000 just when shuttle systems came online, the **National Parks Pass** has changed the financial environment for several case study parks. In particular, Zion and Bryce Canyon find that a large number of visitors they had expected to pay transportation fees are presenting the National Parks Pass; therefore, revenue in these parks falls short of goals for covering the cost of transit. It appears that parks in close proximity with other parks feel the effects of the National Parks Pass more than parks remotely located.

- Gateway communities have developed unique schemes for providing **local contributions** through tax dollars, business user fees, or transportation funding allocations.
- **Philanthropy** has proven highly effective in some situations for providing a foundation for transit finance. Establishing substantial philanthropic contributions requires several years of planning.

The costs of transit typically divide between capital and operating costs. The National Park Service has made strong contributions of **capital funds** for infrastructure and rolling stock, but many case study parks had no means for establishing a plan for replacement of rolling stock. Many gateway communities have neither funded bus stop infrastructure in towns nor established consistent design guidelines. A few private businesses have taken initiative to provide necessary infrastructure in front of their businesses. The National Park Service has a difficult time planning for **operating funds** because no ongoing funding mechanism currently supports transit in parks. In most cases, transit system organizers had to jump into operations without a clear idea of where to get future operating funds, and some systems are now struggling. Gateway communities have demonstrated local creativity in generating money to cover operating costs.

Budget structures exacerbate the problems of funding. Park budgets typically can more easily fund capital than operating, which means it is easier to replace a road than to perform less expensive annual maintenance that will make it last longer despite the extra weight of buses.

4.6.2. Services and Strategies as Outputs

Case studies revealed wide variation in transit outputs. Some systems started with ambitious **scopes of service** intended to capture almost all visitor trips, and some transit plans aimed at a small start with potential for future growth. The extent of route systems, availability of seats on buses, and frequency of service all affected the appeal of transit service. Many of the transit system organizers in the case studies did not seem to understand the sensitivity of the traveling public to changes in these areas.

In some cases, transit system organizers hoped to replace almost all private vehicle trips in certain areas through **private vehicle restrictions**. The concept of private vehicle restrictions generates concerns and debate. For parks with restrictions, case study interviews revealed that most stakeholders felt they were needed; however, those stakeholders with strong familiarity of the recreational areas often identify ways that they individually can get around them (traveling off-season, obtaining special passes, visiting unrestricted areas, or creating facilities with special privileges for local residents) in much the same way that people familiar with crowded areas find ways to avoid congestion.

In many cases, stakeholders hoped to use transit to **substitute for trips** made in oversized recreational vehicles. Stakeholders in multiple parks indicated that recreational vehicle drivers readily use transit as a means of leaving their oversized vehicles parked.

The **design of bus stops** received differing levels of attention. Bus stops in recreational communities with travelers unfamiliar with the area need to make use of transit service intuitive. Flag stops, where bus riders must request the driver to stop, typically do not work well in these situations.

Parking strategies substantially shape the way that visitors interact with transit systems. Parking strategies affected local economies and park budgets in terms of infrastructure construction cost, site purchase or lease, operating costs for routing buses to parking areas, economic opportunity for businesses served (or not served) by transit, parking fee revenue, parking enforcement revenue, and opportunity costs for visitors who choose to avoid areas with insufficient parking availability. **Route structure** determines which businesses receive the benefit of front-door service. A well-planned route structure makes transportation seamless, accommodating all visitor needs, including connections to regional transportation providers.

Most stakeholders undervalued the impact of **intelligent transportation systems (ITS)**, but survey results showed that people choose to ride shuttles after seeing real-time bus departure information, and they feel the technology saves them time. Survey responses also indicated that ITS users visit park regions for longer than non-ITS users do; however, the survey responses do not identify whether people who stay longer use ITS or people who use ITS stay longer (74). ITS, bus stop infrastructure, identified transit vehicles, and various types of media all create transit's **presence** in the eyes of visitors, which helps build confidence to try riding the bus.

Case studies show that most transit system organizers underrate the importance of **communication**. Many stakeholders feel that negative media portrayal of park transportation issues scares visitors away to other vacation destinations. The portrayal of transit in the media requires close attention. Information for the visiting public typically falls short of full visitor needs. The general public sometimes has no easy access to schedules, maps, or the dates of shuttle operation; furthermore, gateway community

business owners feel unprepared for their front-line employees to answer visitor questions about shuttles without better information and preparation. Better dissemination of information will make tourists more comfortable with the idea of visiting park regions and riding shuttles.

4.6.3. Outcomes of Transit Service Initiatives

Traffic congestion mitigation might simply mean averting an increase in traffic as visitation increases, rather than decreasing the actual number of vehicles on local road. As found in the case studies, mitigating traffic problems in one location might simply displace them to another location. Transit as a mitigating measure must work in conjunction with other aspects of a comprehensive transportation plan.

Does the presence of transit affect the number of visitors to parks and gateway communities? Every visitor lost or gained represents a change in visitor spending for local economies, so this question interests many stakeholders. Data from the case study parks indicates **no clear effect of transit on visitation**. The mere presence of transit fails to predict visitation trends, and many other external factors appear to have had a stronger effect on the fluctuations of visitation. Indirect effects can be hypothesized. For instance, parks might gain strong reputations as attractive destinations over time because of their managed traffic or environment minimally affected by vehicle pollutants, but current visitation data cannot speak to such effects. Data do not indicate that tourists stop visiting parks with **private vehicle restrictions**. Other economic impacts of the restrictions appear to be similar to the economic effects of shifting people from private vehicles to transit.

Ridership trends vary. Again, the mere presence of a shuttle guarantees neither strong nor weak ridership. Where some routes specifically serve gateway communities and connect to routes serving park destinations, a core ridership has appeared. In these case studies, this core ridership represented a small proportion of total visitor trips, which indicates that most people still travel by private vehicle; visitor access to gateway community businesses has, therefore, changed little. Although the effect on circulation in businesses remains largely unchanged, even a small portion of trips made by transit can create a meaningful improvement in traffic conditions.

Across many case studies, people reported some similar **characteristics of transit riders**. For instance, foreign tourists readily ride buses, compared to domestic visitors. Regardless of country of origin, people traveling by recreational vehicle find the bus more convenient on local roads than their oversized personal vehicles. Several of the trip purposes of bus riders relate to local economic activity. Commuting employees, shoppers, and diners each have established a presence on the Island Explorer at Acadia National Park. Commuting employees can provide a consistent base ridership year-round, and removing employee cars from local roads lowers traffic congestion at peak times while freeing parking spaces for the entire day.

Transit brings **direct employment opportunities** to gateway communities, as well. In some cases, local residents learn driving skills and obtain commercial driver's licenses as benefits of the employment. In other situations, local areas have a supply of trained and licensed drivers, such as school bus drivers who want to continue to work in the summer. The attractiveness of driver wages varies, as the wages for some services

surpass surrounding county averages, and other systems find the wages they can offer fail to attract drivers or create a content workforce.

Different kinds of businesses experience different kinds of impacts from transit. Some gateway community businesses have found a **shift in demand** for operating hours, based on the convenience of bus riders. Some demand has also shifted away from the retail sector toward service industries for visitors. Lodging and restaurant owners would like to see transit help people decide to stay in the local area longer, but no evidence of this behavior has yet developed in the early years of these case-study transit systems.

Gateway community businesses also often **absorb some of the costs** of offering transit. Financial strategies likely favor large versus small businesses or perhaps lodges over retail shops. Case study transit system organizers distributed the costs and benefits of transit in different ways. Overall, it appears that businesses with front-door bus service will feel economic benefits most during shoulder seasons when visitor activity slows and visitors can choose where to spend their money based on amenity, rather than concerns of no vacancy.

Transit system organizers downplay the effect transit has on **private transportation operators**, such as tour bus companies and taxi cab operators. While distinctions between tours and shuttles exist in theory, the distinctions blur in reality. Private operators report that they do lose customers to shuttles, but these providers also recognize benefit from reduced traffic and the potential for more visitors (prospective customers) to visit the area if the private vehicle infrastructure ceases to cap visitation. The ultimate effect on the bottom line for private operators remains unclear.

Inside parks, some **concessioner operations** benefit from shuttles brining visitors directly to businesses, but some concessioner businesses have experienced negative effects from shuttles. The experience for a given concessioner appears to depend upon the type of business and the business methods historically used.

Economic developers have used park transit to support existing businesses and to attract new businesses. Transit can further assist in expanding business in places where constrained private vehicle infrastructure, such as overcrowded parking lots, limits business growth. Outside Denali, an elaborate commercial area developed where half of the tourists depend on transit.

Familiarity has changed **public reaction** from skepticism to acceptance in many cases. Despite the identified benefits that transit has brought to gateway communities, most stakeholders admitted they held reservations about the idea of a shuttle until they saw it running in their own communities. Similarly, stakeholders expressed skepticism over the usefulness of intelligent transportation systems, although survey results have found that the general public quickly understands the technology and finds it useful for traveling in a recreational area.

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5.0 GUIDANCE AND RECOMMENDATIONS

5.1. Introduction

Based on the review of existing methods and case study findings in seven parks, this research has developed a transit planning and analysis procedure that will help park officials and community representatives estimate and monitor impacts of new or changed transit service on gateway communities with respect to established goals. In accordance with the conceptual model of Figure 1-1 (repeated in Figure 5-1), this chapter indicates ways of tracking inputs, outputs, and outcomes. This tracking will help transit system organizers understand how to produce the inputs necessary to generate the outputs that will lead to desired outcomes, as outlined in locally-established goals. This analysis methodology defines a data collection and analysis procedure that should occur before and after transit implementation, such that transit system organizers can evaluate the impacts of transit according to established goals. These guidelines also describe implementation strategies that accompany the development of alternative transportation strategies and affect the performance of the system. For each individual transit system, stakeholders come to understand typical levels for the measures and start to identify relationships between inputs, outputs and outcomes. If measures of outcomes fail to attain goals, stakeholders can examine levels of corresponding inputs and outputs to identify ways to adjust inputs constructively.

These best-practice recommendations can apply to many resort, recreational, and rural communities. Many of these areas are located in remote locations where transit

service has never been tried. Planning based on the experiences of communities that have faced similar situations and concerns will help communities prepare for the changes associated with new transportation patterns in places where tradition typically runs deep.

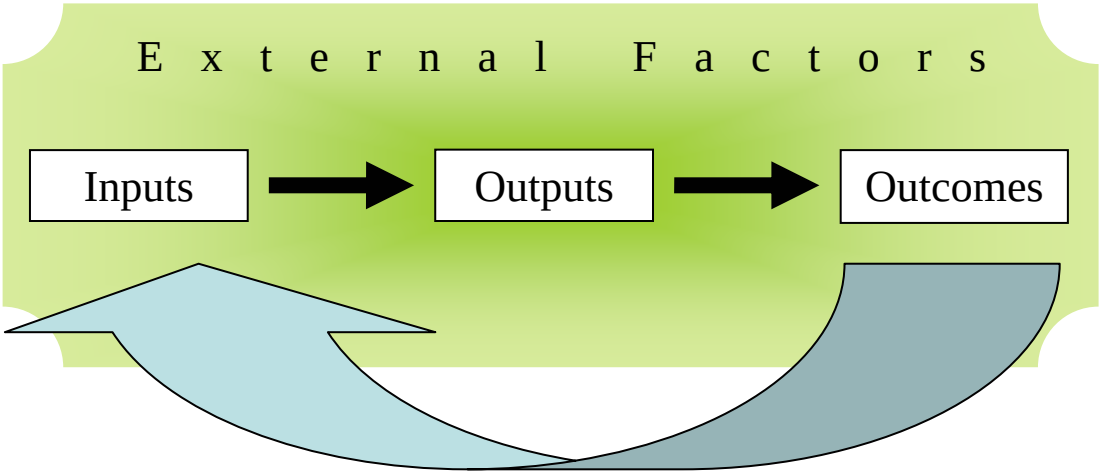


Figure 5-1: Conceptual model of how inputs, outputs, and outcomes of transit relate.

These performance monitoring guidelines also address an identified need for accountability in transportation planning in the National park Service. In its 2002 review of the alternative transportation program in the National Park Service, the General Accounting Office recommended "developing a performance evaluation system for measuring program results [to] improve accountability and decision-making." The guidelines identified here will help individual parks and the Park Service's central alternative transportation office formulate performance monitoring systems to achieve a level of accountability needed for alternative transportation administration.

5.2. Planning and Performance Monitoring

A combination of factors contributes to the effectiveness of transit in parks and gateway communities. The degree to which transit takes people out of private vehicles affects the extent to which the new transportation patterns affect the economies and general activities of local communities. Before evaluating the effects of a transit system, stakeholders in both parks and communities must decide what goals they are trying to achieve. Based on these goals, transit system organizers can evaluate a system's progress toward its goals and what unexpected results have occurred.

Performance measurement against established goals sets a fundamental benchmark and means of tracking progress toward the goals. Performance monitoring helps identify barriers and facilitators affecting that progress. Traditional transit performance measurement considers primarily service operational factors. The handbook for *Federal Lands Alternative Transportation System Program Development* recommends that all federal land transit operators provide performance data as a prerequisite for receiving federal funding (Table 5-1).

Table 5-1: Transit Operator Performance Measures (*89*)

• Annual fleet inventory including make, age and mileage of vehicles/vessels • Annual inventory of other facilities (maintenance, storage, shelters, etc.) • Ridership by route and month • Revenue by route and month • Accident/safety record • Operations and maintenance cost	Service characteristics: • Route maps and distances • Headways • Dates and hours of operation • Fares • Vehicle miles of service by month • Vehicle hours of service by month • Missed trips

Table 5-2: Performance Measurement Procedures

Transit Cooperative Research Program Standards (*90*)	Modified Standards for Public Lands and Gateway Communities
1. Define goals and objectives	1. Identify partners and stakeholders; design a public involvement strategy
2. Generate management support	2. Define and address goals and objectives according to stakeholder interests
3. Identify users, stakeholders, and constraints	3. Select performance measures and develop consensus
4. Select performance measures and develop consensus	4. Design the transit system and communication program
5. Test and implement the program	5. Consider available resources
6. Monitor and report performance	6. Test and implement the performance monitoring program
7. Integrate results into agency decision-making	7. Monitor and report performance
8. Review and update the program	8. Integrate results into transit decision-making
	9. Review and update the performance monitoring program

In addition, planners for parks and communities should also monitor impacts on mobility and local economies. Viewing these impacts as outcomes of transit service, a traditional performance measurement procedure can provide the basis for monitoring economic impacts. The Transit Cooperative Research Program recommends a performance measurement system with eight steps. With the unique characteristics of recreational communities and the need to create partnerships rather than lead agencies, the order of these steps should be modified (Table 5-2). In particular, the role of stakeholders and partners needs to move higher on the list. The 2003 National Park Service's memorandum of understanding with the National Association of Regional

Councils demonstrates that partnering comes first, and partners should determine the goals and objectives in collaboration.

Performance monitoring for a transit system must work in conjunction with the comprehensive planning process for transportation in the park and region. The Alternative Transportation division of the National Park Service has developed a transit-specific checklist for the transportation planning and implementation process in parks. This checklist provides guidelines within an eight-step framework (*91*):

1. **Describe transportation problem**
   a. Identify issues and needs
   b. Develop goals and objectives
   c. Collect and analyze data
   d. List possible solutions
   e. Evaluate possible solutions based on the ability to meet goals and objectives
   f. Select preferred solution
2. **Develop project alternatives**
3. **Evaluate alternatives**
4. **Choose preferred alternative**
5. **Finalize scope**
6. **Secure funding**
7. **Finalize design**
8. **Construction & operations**

Transportation planners in parks should work both with this eight-step overall planning framework and with the performance monitoring guidance described in this report. The two procedures complement and feed into each other. On the surface, the performance monitoring procedures fits almost entirely within finalizing planning, the fifth step of the planning process. Closer consideration shows that the two frameworks intertwine. The goals and objectives established in the first step of the planning process will flow into the development of goals used in the performance monitoring system; however, the selection of the preferred alternative allows transportation system

organizers to refine and focus the goals of the system. For instance, if initial goals in the planning process called for a reduction in air pollution, the fuel selected for shuttle service might perform well in reducing hydrocarbons, but poorly in reducing sulfates. The performance monitoring goal might stipulate reductions in hydrocarbon pollutants with the objectives of a ten percent reduction in hydrocarbons in five years, whereas policy makers might establish the goal for sulfates at maintaining existing levels. Similarly, the stakeholder group gathered at the start of the planning process might mutate slightly if the selected transportation option affects new groups or has little to no impact on a stakeholder who had appeared important. Data collection for the transportation planning process will contribute to the performance monitoring procedures; however, thorough performance monitoring will almost certainly require further data collection.

5.2.1. Step One: Identify Partners and Stakeholders; Design a Public Involvement Strategy.

As a primary input to launching transit, the National Park Service recognizes that it needs to work in partnership with other agencies and local stakeholders to generate the support needed for successful transit initiatives (*92*). In particular, the National Park Service has identified the importance of relationships with gateway communities. The National Park Service Strategic Plan explicitly states that parks should work toward partnering with communities to reach mutual objectives (*93*). Best-practice procedures for partnering are documented in the *Park Planning Sourcebook* (*94*) created to assist park planners. Development and planning professionals have created literature to guide gateway community leaders, as well (*95*). The Volpe National Transportation Systems

Center in the U.S. Department of Transportation has documented the contributions of partnerships in launching shuttle service (*96*).

The core nature of planning for public areas requires an acknowledgment that multiple parties have a stake in the outcome, and multiple parties can contribute to the success or failure of projects and policies. Repeatedly, alternative transportation planners in the National Park Service have found that partnerships between governmental agencies, the private sector, nonprofit organizations, and other stakeholders have created transit systems received well by park visitors and gateway communities. When community partners came to the table, the planned transit design at Zion National Park changed from a park-only system to a two-loop system serving the gateway community and the park. The resulting system reduced the need for parking inside the park and providing auto-free access to restaurants and shops for visitors (*97*). Transit planners for Acadia National Park also give credit to partnering for creating a system that provides for the needs of patrons and employees of local businesses, as well as park visitors and staff (*96*). Case studies have shown that transit systems with strong partnerships have advantages during good times, as in the needed capacity expansion at Acadia, and strained times, as in the need to support reductions in anticipated funding at Zion. In contrast, Bryce Canyon has struggled in isolation with its financial crisis. In some parks, a lack of partnering or a breakdown in the partnering process appears to have contributed to low ridership and meager general acceptance of transit serving. True two-way communication between partners and contribution by all stakeholders makes the difference.

Case study national parks have demonstrated that the people in park administration take a leading role in determining the productivity of partnerships. The personalities of park personnel heavily influence the interaction with other stakeholders; therefore, the National Park Service must carefully select people for public interaction based on their ability to create strong relationships with local leaders and other stakeholders. In an agency known for moving staff from location to location across the nation, people placed in positions as liaisons with stakeholders will preferably commit to staying in the local area for several years.

Many rural parks and their surrounding regions have limited local expertise in transportation. Without such professional resources, local stakeholders might be tempted to get the transportation planning process underway until enough momentum has developed to justify the effort and expense of bringing a transportation professional or organization into the local area and process, but transit system organizers at Zion stated that they learned a lesson about the importance of bringing the transportation experts into the process early to make sure that the plans made reflected best practices and viable alternatives.

On the opposite end of the spectrum from transportation expertise, transit system organizers in case study parks have found value in involving even stakeholders who might have reason to oppose transit. Taxi drivers participated in the planning process for the Provincetown-Truro Shuttle on Cape Cod. These small businesses expressed their concerns for loss of business, and shuttle route designers accommodated them by reserving the airport for taxi access. This concession brought the support of the taxi companies, as opposed to a long-standing latent opposition. In contrast, the five-county

collaborative process at Yosemite ran into disagreements among participants. Rather than working through the problems, two counties stopped participating, and their opposition continues to cost time, money, and aggravation in public processes. Consistent with most of the case studies, tour bus operators, who offer services similar to the shuttles without public subsidy, have had little to no voice, and most stakeholders involved in organizing transit systems have had little sense of the impact of shuttles on tour bus operators. Future transit initiatives should include local tour bus operators, as well as other stakeholders who might experience negative effects from the introduction of shuttles. Case studies showed that these stakeholders will often willingly accept some negative repercussions on themselves in favor of the public good expected through the goals of transit.

Whereas the Transit Cooperative Research Program standards establish a separate step to achieve management support in a transportation agency (*90*), transit in the stakeholder-rich context of recreational areas needs to consider park management as one of many vital stakeholders. Without genuine park management support, transit will likely falter, as in the case of Hot Springs, but other stakeholders and other levels of management support take especially strong roles, as well. Bryce Canyon demonstrated that park management support alone could not sustain a transit system through financial difficulties. The system started without the dedicated partnership of the central offices of the National Park Service, which resulted in

In addition to local stakeholders targeted in case studies associated with this research (Table 5-3), a number of government agencies can provide expertise and financial support for transit systems when they become partners in the process:

Table 5-3: Local Stakeholders

Local Group or Sector	Possible Representatives
The business community	Chambers of commerce Tourism agencies Park concessioners
The local population	Elected representatives (mayors or council people) Town managers
Local economic development planning	Town planning departments Planning commissioners
Transit operations	Transit operators
Park administration	Park superintendence Concessioner liaisons
Nonprofit organizations	Friends groups Natural history associations
General local knowledge	Varied titles

- State departments of transportation
- U.S. Department of Transportation Federal Highway Administration
- U.S. Department of Transportation Federal Transit Administration
- U.S. Department of Transportation Volpe Transportation Research Center
- National Park Service Denver Service Center
- National Park Service Alternative Transportation Group

The impact of soft factors like partnering can never be isolated in social science experiments because too many other factors change along with changes in relations; however, greater acceptance in local communities and businesses where partnering is deemed a success suggests positive economic impacts through positive relationships.

5.2.2. Step Two: Define and Address Goals and Objectives According to Stakeholder Interests.

The identified partners must work together to identify a critical input to the transit process: goals. Parks and gateway communities must collaborate to determine what kind of visitor flow and mobility they want to achieve, what kind of outcomes they would like to see in the region, and how to attain the desired future. The design of the transit service will differ depending on the intended results, and a performance monitoring should target both progress toward those goals and the externalities associated with transit systems.

This case study research identified several primary goals for park transit, namely:

- Improvements in traffic, parking problems, and perceptions of crowding
- Increasing safety associated with motor vehicles
- Mitigating environmental impacts from motor vehicles

Other typical goals identified in a 2001 comprehensive national study of transit needs for federal lands include (*98*):

- "Enhancing visitor mobility and accessibility;
- "Preserving sensitive natural, cultural, and historic resources;
- "Providing improved interpretation, education and visitor information services;
- "Reducing pollution; and
- "Improving economic development opportunities for gateway communities."

These stated goals allow analysts to form strategies for monitoring the performance of shuttle systems against those goals, but stakeholders in several case studies implied other goals. Business owners do not want to see their businesses suffer from changes in visitor

mobility, but beyond the stated goals, externalities can appear in many different forms. Transit system organizers should try to anticipate as many externalities as possible to mitigate negative consequences and take advantage of side benefits. For instance, none of the case study park transit systems listed economic development as a goal, yet many people have speculated on the economic impacts of transit.

Case studies have shown that transit system organizers need to create comprehensive transportation plans that consider the externalities of policy actions. In Denali, the park transit system resulted in the development of a transit-dependent tourism community outside the park on a high-speed highway. In response to several pedestrian fatalities in the area, transportation planning has called for lower speed limits and the construction of facilities to protect pedestrians. In Acadia, park and local leaders have worked in recent years to develop transit, intelligent transportation systems, enhanced bicycling safety, and regional intercity transportation as components in collaborative transportation planning among a multitude of agencies and organizations. Each piece of comprehensive transportation planning affects other aspects of local mobility.

Designers of alternative transportation systems need to consider a range of alternatives in a comprehensive transportation plan. For many parks with their congested roadways connecting distant point-to-point attractions, traditional transit alternatives are well suited; however, park managers should consider the cumulative effects of transit service. If multiple 40-passenger buses arrive at the same time to experience a sensitive resource, the instantaneous heavy exposure of the resource might do as much or more damage as if people arrived by a random process. Other options include finding ways of spreading peak demand for resource visitation, not just for transportation facilities.

Enough interest in the externality of economic impacts existed to warrant this study, which suggests that economic impacts should appear on the list of goals. These goals could call for economic growth or merely for maintaining current levels of prosperity. Formal economic goals belong in the list of common goals for transit in recreational areas:

- Preserve the economic vitality of local businesses
- Expand local economic development possibilities within the context of sustainable transportation.

All outcomes should either meet goals for the shuttle system, or the outcomes should come as an anticipated and accepted byproduct necessary in achieving a goal. All stakeholders should understand how the outcomes benefit them or how they contribute to other stakeholders in the community. This understanding helps achieve buy-in from stakeholders.

Gateway communities share visions with park administrations and transit operators in many cases, but they also have needs of their own which can have often benefit parks in turn. The Town of Springdale outside Zion National Park has done some of the most proactive planning work surrounding local park transit by identifying goals in its vision statement, such as “extending the in-the-park experience to the town” and “providing infrastructure, services, facilities, amenities and alternate modes of transportation to enhance the lives of our residents and the experience of [its] guests.”

5.2.3. Step Three: Select Performance Measures and Develop Consensus.

The final input of the transit planning process relates to defining desired and acceptable levels of inputs, outputs, and outcomes; defining these levels first requires

understanding how to measure those levels. Parks and gateway communities need to define relevant performance measure and collect associated data. Given the number of stakeholders with interests in transit in parks, a number of stakeholders should contribute to the ongoing evaluation of transit systems. Different stakeholders have access to different types of data, and the data used to monitor transit should serve the many various interests represented (Table 5-4). The types of data needed will vary from system to system. In each case, transit system organizers need to determine which performance measures will indicate progress on achieving the goals specified and what monitoring of externalities must occur. They must also consider who can best gather those data and what costs the data gathering will incur.

The basic data received from collection often provides insight. For instance, tracking basic traffic counts over time provides insight into trends of increasing or decreasing traffic. Wherever possible, automated systems should contribute to basic data collection. Smart traffic counters can provide automatic vehicle counts by time of day, automatic counting technology can similarly count bus riders, and global positioning systems (GPS) can indicate route and vehicle performance, as well as combining with automatic ridership counting to determine the locations of passenger activity. Automated data collection provides consistency in tracking methods.

Table 5-4: Examples of Measures for Monitoring Performance toward Goals

		Measures	Monitoring	Reporting
Traffic, Parking, and Crowding	Input	• Traffic policies (description) • Parking policies (description) • Private vehicle restrictions (description) • Enforcement (funding and jobs)	Transport departments, state and local government, and Park Service	When changed
	Output	• Roadway capacity (vehicles per hour) • Parking capacity (count of spaces, locations, and typical distribution of parking durations)	Transport agencies	When changed
	Outcome	• Vehicle counts in the park (count by road, time of day, day of week, and time of season; peak periods; and, peak hours) • Vehicle counts in the community (count by road, time of day, day of week, and time of season; peak periods; and, peak hours) • Vehicle counts on state roads (count by road, time of day, day of week, and time of season; peak periods; and, peak hours) • Local household vehicle ownership (survey) • Parking revenue (amount)	Transport departments, state and local government, and National Park Service	Annual
Transportation Safety	Input	• Transit in dangerous traffic locations (location count or yes/no) • Alternative transportation marketing (funding) • Private vehicle restrictions (yes/no) • Enforcement (funding) • Enforcement staff (employees)	Park Service and local government	Annual
	Output	• Ridership in dangerous traffic locations (count)	Transit operator	Annual
		• Reduced traffic in dangerous traffic locations (vehicle count)	Transport departments	
		• Visitation in dangerous traffic locations (survey or observation)	National Park Service	
	Outcome	• Incident reports (count) • Complaints (count) • Observed near-incidents (count) • Severity (injuries or damage value)	Law enforcement	Annual
Environmental Impact	Input	• Attraction visitor capacity (visitors)	National Park Service	Decennial
		• Visitor education (funding) • Enforcement (funding) • Enforcement staff (employees)	National Park Service	Annual
	Output	• Use metering (visitors/time) • Visitor education programs (funding) • Signs and physical barriers (funding or count) • Transportation volume caps (parking or vehicle)	National Park Service	Annual
	Outcome	• Violations (count) • Duration of noise in specified locations (time) • Noise Volume in specified locations (measure) • Air pollutants (count/volume) • Space used for informal parking (area) • Runoff contaminants in ground and streams (count/volume)	National Park Service	Annual

Table 5-4 (continued)

		Measures	Monitoring	Reporting
Gateway Community Economic Impact	Input	• Driver wages compared to local average (salary) • Driver wages compared with local bus drivers (salary)	Transit operator	Annual
		• Businesses served (count, percentage, and area) • Industries served (categorized count and percentage)	Business community	Annual
		• Transit training for seasonal workers (funding, session count, and trainee count)	Designated partner	Annual
		• Zoning and other transit-oriented development policy (description and building permits)	Local government	Quinquennial
	Output	• Transit operations positions available (count) • Transit positions filled (count and percentage) • Commercial driver's licenses issued locally (count)	Transit operator	Annual
		• New transit-oriented development (building permit count, square footage, business count, and job count)	Local government	Annual
	Outcome	• Transit local and out-of-town workforce (job count) • Applications per position (count and percentage) • Runs missed due to staffing (count and percentage) • Ridership at commercial stops (count)	Transit operator	Annual
		• Employees commuting by bus (count and percentage) • Transit-dependent employees (count and percentage) • Businesses in service area (count and percentage) • Concentration of industries/economic diversity (count and percentage) • Spending demographics by industry (amount)	Business community	5 years
		• Campground receipts (amount and count of permits)) • Park entrance receipts (amount) • Visitation (count)	National Park Service	Annual
		• Tourism/ bed tax revenue (amount)	Local government	Annual
Partnering	Input	• Participants (agency count or person count) • Number of interests (count by classification) • Meetings (frequency or count) • Dedicated staff members (count) • Communication policies (description or funding) • Incentives for businesses and organizations supporting transit (description or value)	Designated partner	Annual
	Output	• Perception of how well viewpoints are heard (survey scale 1-5) • Perception of progress for goals (survey scale 1-5) • Perception of value of the partnering process (survey scale 1-5)	Designated partner	Quinquennial
	Outcome	• Businesses and organizations supporting transit (count and percentage of potential) • Businesses and organizations advertising transit (count and percentage of potential) • Businesses and organizations funding transit (count, percentage of potential, and funding) • Community-generated contributions for transit (source count and funding)	Designated partner	Annual

Table 5-4 (continued)

		Measures	Monitoring	Reporting
Transit Operation and Fiscal Management	Input	• Operating, communication, and monitoring funding (amounts and sources) • Capital funding (amounts and sources) • Fares charged (amount)	Transit operator	Annual
		• Traffic signal preference for buses (state and local government)	Transport departments	Annual
		• Entrance fees for transit riders vs. drivers (amount) • Transportation fee charged (amount)	National Park Service	Annual
	Output	• Transit fleet (count by make, age and mileage) • Transit capacity (count for passengers, bicycles, wheelchairs, and so forth) • Transit facilities (count, description, and value for maintenance, storage, shelters, and so forth) • Dates and hours of operation (schedule) • Frequency and/or headways (departures per hour and/or minutes between departures) • Routes served (map, count, and distance) • Stops served (map and count) • Utilization (hours and miles of operation per vehicle) • Reliability (count and percentage for missed trips and late departures) • Transit jobs (count) • Deadheading (time and distance) • Operating, communication, and monitoring costs (amount) • Capital costs (amount) • Outstanding needs in capital and operations (description, funding amount, and percentage)	Transit operator	Annual
	Outcome	• Ridership (count by route, time of day, day of week, and time of season; peak periods; and, peak hours) • Wheelchair-assisted trips (count) • Ridership targets relative to visitation (level by month) • Trip purposes (survey count) • Rider demographics (survey count) • Safety record (incident count) • Fare revenue (amount by route, time of day, day of week, and time of season) • Farebox recovery (percentage) • Donations (amount and count of contributors)	Transit operator	Annual
		• Transportation fee revenue (amount) • National Parks Passes sold (count and date of sales) • National Parks Passes presented (count and dates)	National Park Service	Annual

Table 5-4 (continued)

		Measures	Monitoring	Reporting
Mobility and Coverage	Input	• Roads in park (distance) • Attractions deemed should be served (count)	National Park Service	As needed
		• Roads in community to serve (distance)	Local government	Quinquennial
		• Businesses deemed should be served (count)	Business community	Quinquennial
	Output	• Park roads covered (distance) • Attractions transit serves (count and percentage) • Businesses transit serves (count and percentage by fixed stop and by flag stop)	Transit operator	Annual
	Outcome	• Visitors traveling without a private vehicle (survey count and percentage) • Visitors using transit (survey count and percentage) • Visitor demographics (survey counts by season)	Park Service	Quinquennial
Visitor Experience	Input	• Transit information and communication (funding) • Transit amenities (funding, count, and description) • Interpretation for transit passengers (funding, employees, materials, and description)	Designated partner	Annual
	Output	• Media used to communicate (descriptions and counts) • Training and education for seasonal workers (session and participant counts) • Interpretive programs along transit routes (session description and count)	Designated partner	Annual
	Outcome	• Requests for information (count) • Web site hits (count) • Telephone calls (count)	Designated partner	Annual
		• Complaints of confusion (count and percentage) • Perception of information availability and communication (survey scale 1-5) • Wildlife sightings (survey count of sightings and count and percentage of visitors who sight) • Trip purpose (survey count) • Trip destination (survey and stop alightings counts) • Trip origin (survey and stop boarding counts) • Rider satisfaction (survey scale 1-5)	Transit operator	Annual

In some cases, performance measures offer important information when multiple data sources combine into a unique measure. For instance, traffic counts compared to a calculated parking or roadway capacity shows the percentage of capacity used. This measure can indicate if demand exceeds supply and how often. From this information, transportation managers can decide if uncomfortably crowded conditions exist just at extreme peak times or if the problem pervades into normal operations.

As partners in transit system organization discuss performance measures, they must decide and develop consensus over which performance measures to use and how to use them. This process returns to the idea of the established goals. The partners will come to the table with different priorities, so establishing which measures take precedence will require discussion, understanding of each other's needs, and compromise. The consensus-building will need to elevate to a higher level when it comes time to set objectives and a timeline for levels of attainment for each measure. Partners should plan on a lengthy process to identify these measures and develop consensus over priorities, but the resulting system will establish expectations for all stakeholders and will help make system management run as smoothly as possible.

5.2.3.1. Examine Visitor Behavior and Needs.

Visitors usually make their choices quietly and privately, but planners need to understand the individual choices of millions of visitors. Information on their choices comes from counting programs and surveys. These tools can indicate trends in visitation, as well as transportation choices that people make. Analysts need to examine these data in the context of other parks and regional and national economic trends.

5.2.3.2. Monitor Movement and Mobility in the Region.

Stakeholders in tourism areas hold a strong interest in the number of visitors who come to the area each year. Growing or declining visitation numbers typically provide strong indications of the health of local economies. Traditionally, most rural national parks measure visitation by multiplying a highway traffic count by an average number of passengers per vehicle, so the introduction of buses in parks changes the way visitors are counted. An average bus occupancy, a ridership count, or a pedestrian count suddenly becomes a much more important factor than it ever had been previously. With the change in the way parks count visitation with the introduction of a bus system, visitation estimates for the years preceding and following the startup year are not directly comparable.

For the purposes of understanding changes in visitation, traffic counts offer a means of tracking the number of people coming into and going out of an area. Traffic counting requires coordination between agencies and across many modes.

State departments of transportation report highway traffic counts annually for most state roads; however, these counts do not always come as the result of direct measurement. Many times, a lack of equipment or labor will lead transportation departments to take traffic counts every few years and estimate interim years based on population figures and projections, and the month of the year when traffic counts are taken does not necessarily stay constant. For the purpose of evaluating changes in visitation, agencies must coordinate to decide base years and specify months for taking traffic counts on every road entering into a park region. If possible, smart traffic counters should be used to record vehicles per hour by time of day. Smart traffic counters can also evaluate the difference between passenger cars, delivery trucks, and tour buses. These

distinctions can refine the analysis of changing traffic patterns, showing if more or fewer people arrive by bus, as opposed to private automobiles.

Inside the park, automatic data collection programs can establish important trend information at low cost. Vehicle count data entails some initial cost for equipment, but follow up cost and training can be minimal. Many parks only have vehicle counters at entrance stations, offering no sense of circulation within the park. Because parking poses a challenge in many places, automatic counters at parking entrances and exits or parking meters monitoring duration of stay could offer important information about visitor flow at major attractions.

Most parks charge fees for tour buses to enter park boundaries, so park fee collection offices should have information on either the number of tour buses or the amount of money collected from tour bus operators. These data might include the size of the buses, or an average occupancy should be determined.

Regional airports will track information on airport enplanements and operations. The enplanements indicate how many passengers get onto commercial flights at the airport. Operations show how many take-offs and landings occur there. These operations include both tour flightseeing and general aviation traffic to and from the area (the numbers rarely differentiate these two groups). Any airport receiving federal funding must track these air traffic measures, so data are typically readily available for analysis.

Passenger ferry counts can fall under either private or public domain. Some ferries run as government operations, and some companies run private ferry businesses. Private operators might hesitate to share passenger counts because that information might have competitive sensitivity; however, those operators might make willing partners in the

transit process. At a minimum, data on the percentage change of ferry passengers against a base year will inform the visitation analysis.

Cruise ship operators do not readily share data on passenger counts due to the highly competitive nature of the business; however, communities with harbors can receive a large amount of tourism traffic via cruise ships. Although the passenger counts might not be available, the number of cruise ship arrivals and the capacity of those ships are readily available and should be tracked over time.

Provincetown, Massachusetts offers an example of a community where all of these measures should be taken. At the outermost tip of Cape Cod, visitors arrive by car, bus, ferry, and air carrier. Accurate counts on al of these modes before and after transit implementation could have offered a detailed depiction of changing visitor patterns resulting from transit.

Once a transit system begins operations, data on shuttle ridership can provide insight on trends in system acceptance. Detailed data can show visitor circulation and demand. Ridership data should be gathered by time of day and by stop location. Day-of-week data can show if weekend traffic differs from weekday traffic, which might indicate that local residents are using the system extensively on weekends. Intelligent transportation systems can provide reliable detailed data. If transit system organizers cannot incorporate such technology, the ridership data collection program will require careful coordination and planning.

5.2.3.3. Identify Safety Issues.

Following directly from the idea of monitoring travel behavior comes investigation of the result of travel behavior: traffic safety. Under crowded or frustrating traffic

conditions, traffic safety will likely deteriorate; therefore, transit system organizers hope that improving traffic conditions will improve safety for visitors and local residents. Most safety conditions reveal themselves through basic tallies of traffic crashes, pedestrian injuries, and visitor complaints about dangerous conditions.

If particularly dangerous intersections or other sites exist, park administrations and gateway community leaders should consider conducting annual studies with observation of traffic behavior at the site. With well-defined guidelines for observation of incidents and near-incidents, local researchers can establish a historical database to indicate trends in safety.

5.2.3.4. Conduct Visitor Studies.

With a strong emphasis on providing a high-quality visitor experience in national parks, visitor characteristics, decisions, and opinions must receive close attention. Visitor surveys provide the most direct means of getting information on visitor behavior, and visitor surveys provide a rigorous means of monitoring how visitors react to shuttles. The visitor is the primary unit of analysis in evaluations of social science issues related to national parks.

Parks and communities with transit service should establish an ongoing survey program to monitor visitor behavior. This survey program should start before transit service is initiated and continue every five years thereafter. As with the U.S. Census, this program will give planners and businesses important information on visitor needs and trends, so local transit service and businesses can accommodate visitors through informed planning. The information from this type of survey program will allow transit planners to provide the right amount of service in the places where it is needed and give local

businesses information to develop strategies to attract and serve customers better. Survey results will also allow other parks and gateway communities considering implementing transit to learn from the experience of parks with transit, so planners can anticipate changes and prepare accordingly.

Visitor surveys can include questions on daily expenditures, durations of stay, and other economic variables. The results can show the places people frequent and the mode of transportation they used. These surveys also classify visitors demographically. When designing visitor surveys, analysts should include questions that will allow isolating visitor spending by visitor category. In particular, how much money do foreign visitor groups spend each day on average compared to daily spending of American groups? How much do the recreational vehicle travelers spend? If these groups find transit particularly appealing and transit might attract a greater percentage of visitors from these groups, will transit bring people who spend more or less money to the area? Over time, people involved with planning the surveys will realize that surveys should ask some questions regularly, some old questions lose their relevance, and some new questions belong on the survey. On the other hand, the form of questions used in visitor use and business surveys should be maintained to allow comparison of results over time. Experts in survey design should contribute to the preparation of surveys to maintain as much comparability from survey to survey as possible while keeping current with needs for information.

None of the parks in the case studies for this research had conducted visitor use studies in anticipation of new transit systems. Several parks had studies dating back to the early to mid-1990s, which was a different economic era in the country, compared to

the time when new transit systems began or significantly changed operations in most of the case study parks in 1999 or 2000. With no data on visitor behavior before service and no current information, evaluation of transit impacts must rely largely on local memory and perception.

Parks typically take visitor use surveys infrequently and irregularly, but since the institution of the Government Performance Results Act of 1993, the National Park Service has taken increased interest in visitor use surveys through regular use of national visitor survey cards (*99*). Though this card's design does not directly address questions of park transit, it shows momentum toward gaining regular information on visitor demographics and behavior. Transit planners in parks and communities can take advantage of this momentum to get the information they need to monitor the impacts of transit systems and plan accordingly. The National Park Service's Alternative Transportation Program Strategy Plan for fiscal years 2002 through 2006 specifies the need to consider a transportation-specific question on the National Park Service Social Science Office's visitor survey card (*100*).

Visitor demographic trends assessment will be of immediate interest in analyzing visitor data. Most parks and communities with transit already have noticed that foreign visitors take to riding the bus more readily than domestic visitors do. Understanding whether college students, young families, or the elderly ride the bus most frequently will help planners target supporting services to the needs of particular demographic groups. Demographic profiles will also help in planning to target groups that are reticent to take the bus.

Visitor surveys in individual parks planning or operating transit should not occur just once. Surveys provide important snapshots for local leaders to evaluate current conditions, and repeated surveys allow monitoring of trends. Parks planning shuttles should conduct visitor use surveys two years before implementing transit and in the first or second year of transit service to understand the immediate impacts of the system. Park administrations should then establish a regular pattern of surveying visitors every five years to monitor the ability of the transit system to reach its goals over time.

5.2.3.5. Evaluate the Local Economy.

Local businesses in gateway communities have information relevant to two important areas of monitoring the impacts of transit: local memory local and economic health. Business listings and data on businesses can offer important insight into local economic health and trends, while business surveys and interviews can tap into local memory and perspective.

Business composition in the local economy could change as a result of transit because the change in mode of transportation changes visitors' needs. In the experience of the Zion Canyon Shuttle, local businesses found fewer people were buying souvenirs at retail stores when they knew they needed to carry the items on the bus or on the trails; on the other hand, demand for service industries increased. For instance, local businesses noted an increase in bicycle rentals because people felt safe riding when they were not dodging all the private automobiles.

Local experience will depend on design and other characteristics, so a local area needs to monitor its own economy over time to see how it reacts to new transportation service. Before transit operations begin, planners need to get a solid business listing.

The business listing may or may not already exist. Some local governments keep detailed lists of businesses, though they might record businesses coming into existence without recording the ones that have gone out of business. The City of Hot Springs National Park maintains a database of all businesses in the city; whereas, neither Bar Harbor nor the State of Maine can produce a list of businesses based on location in the area (Maine's Bureau of Corporations under the Secretary of State maintains a database based on the address of the lawyer who files for a business's license, but not based on the address of the business). Local chambers of commerce can play a strong role in securing this listing; however, chamber membership does not necessarily describe local business communities accurately. For instance, the chamber outside Zion National Park believes its membership contains 90 percent of local businesses, but the chamber near Acadia National Park suspects it only has 50 percent of local businesses.

Securing an accurate business listing for evaluating the local economy will likely require some form of business census for the study year. Planners might consider doing a business survey to learn about employment trends in hiring, layoffs, seasonal and permanent employment opportunities, the duration of seasonal employment, and the turnover of employees. Business surveys and interviews pull information from local memory and perspective. At a minimum, the business list should indicate the business name, address, and the type of business. The address can be used to analyze how close businesses are located to transit stops. In small communities, business revenues are likely too sensitive to obtain because anonymity cannot be guaranteed.

Business surveys can offer proxy information on visitor behavior when no base year data on visitors exist because business owners can recall and discuss their opinions of

what trends they have perceived, but given a choice of surveying visitors or surveying businesses about visitor behavior, surveying visitors is preferred. The sample size of visitors will be large enough to assure anonymity through aggregated results, whereas only a small number of businesses recognize the effects of transit in gateway communities. For questions of visitor behavior and spending, visitor use surveys are more direct than business surveys, in which results filter through a business owner's perspective. Business surveys are most useful if researchers want to identify business-specific information, such as the strategies used to attract the transit-riding public.

5.2.3.6. Benchmark Environmental Impacts of Transportation.

Recreational regions have unique environmental concerns based on factors such as topography, climate, surrounding development, and so forth. Many national parks already have established air or water quality monitoring. Moving large numbers of visitors from private automobiles to transit will change the way that the movement of people interacts with the environment.

Moving people from cars to transit will reduce some environmental impacts and create or exacerbate others. For instance, moving visitors from gasoline-powered private vehicles to diesel-powered buses will reduce nitrous oxide emissions, but might increase particulate matter in the air. This trade-off makes sense in an area with sensitivity to nitrous oxides and capacity to handle more particulate matter. When parks and park regions initiate transit service, supporting groups implicitly accept the trade-off between the environmental impacts of public and private vehicles and judge that the local environment can better tolerate the impacts of transit vehicles. Performance monitoring

for park transit should include ways to measure both environmental improvements and the negative consequences of transit.

Some of the measures used to determine trends and changes in environmental impact have commonly appeared in transportation analysis, but the sensitive environments of national parks might require new types of monitoring. Typical measures include common air pollutants and visibility. For noise pollution, the National Parks Conservation Association conducted research on what percentage of time the sound of snowmobile engines interfered with the quiet of nature at designated attractions in Yellowstone National Park (*101*), and the Volpe National Transportation Systems Center is currently working on procedures for noise monitoring of traffic. Other monitoring might include the area of vegetation loss incurred when informal parking damages natural roadsides. Yosemite National Park's 1980 general management plan specifically designated the need to reduce glare created by vehicles (*102*). Wildlife sightings and traffic incidents affecting wildlife could also serve as important environmental indicators. This cursory list offers examples of environmental monitoring. Stakeholders in the transit planning process need to determine what environmental changes from transit will most affect the sensitivities of their specific local region to indicate the types of measures needed in performance monitoring.

5.2.3.7. Collect Data on Transit Performance.

If some level of transit service already exists, transit system organizers need to benchmark it to define a base year before making changes to transit service. If no service already exists, planning stages for a new system need to include defining the measures needed and arranging funding and scheduling for performance monitoring. This

monitoring plan will need to go into the service contract for the transit operator. Setting levels for acceptable and desired transit performance poses a challenge in regions that have never tried offering alternative transportation. Whether or not transit has existed, system designers need to look elsewhere for comparable systems. Every gateway community is unique, but most tourism communities have some characteristics comparable to other communities.

Transit operators typically provide data on operations performance as part of their contractual obligations, as identified in Table 5-1. Case study parks for this research universally provided ridership tallies. Some park transit operators also offered data on driver workforce size, wheelchair-assisted trips, and deadhead time and distance indicating when buses rolled with no passengers aboard (for example, trips from the bus depot to the start of a route). Beyond these widely-used metrics, transit system organizers should consider whether measures of specifically local relevance should appear in the performance monitoring program.

Transit ridership data offer some information on the question of how visitors feel about the transit service. Total ridership has increased in each year of operation for many of the new systems. Increases in ridership indicate one of two things (or a combination of the two): either more people are taking transit, or the people who take transit are taking more trips by transit. Visitors and local residents have different motivations for changing ridership numbers in these categories (Table 5-5). Factors such as perception of transit service quality, perception of private vehicle congestion, and private vehicle restrictions will affect trip-making for both visitors and local residents. Demographic composition will likely affect both the proportion of people using transit and the number of trips taken

per person. Determining the extent to which these phenomena happen would require a survey of park visitors; however, existing ridership data can show general trends of increasing or decreasing activity on transit systems as gateway community residents and recreational visitors to the parks get more familiar with the systems.

Table 5-5: Factors Affecting the Number of Trips by Transit

	The number of people using transit	The number of trips taken by people already using transit
Visitors	• Trends in total visitation • The proportion of visitors using transit	• The total amount of time visitors spend in the area • Trends in windshield tourism versus stopping to visit attractions • The amount of time spent at each stop (e.g. hours spent hiking a trail versus minutes spent at each of many stops) • Various trip purposes (sight seeing, trail access, dining, or other trips)
Locals	• Trends in permanent or seasonal population • The proportion of locals using transit	• Various trip purposes (commute, shopping, recreational, or other trips)

Ridership data should come at a disaggregate level. Most transit operators can track ridership, at least for a sample of time, according to boardings for each run. Some manage to tabulate boardings for each given stop on a run. Such data allow thorough analysis of visitor flow by time of day, which allows highly refined transit planning. These data also help local businesses, governments, and organizations plan staffing and other operations to provide capacity when and where visitors need it. From the disaggregate level, analysts can aggregate to determine weekend or weekday peaking, trends through the season, and annual changes in ridership.

Transit system organizers should set ridership goals relative to visitation. Individual parks can use this measure to track transit's penetration into personal mobility over time .In some parks, a small percentage of visitor trips by transit can make sufficient difference in traffic congestion, whereas other park regions might need to eliminate most trips by private vehicle. The extent to which transit trips will replace private vehicle trips depends on planning factors, service quality, and funding and other resources dedicated to transit. For instance, private vehicle restrictions raise ridership far above the ridership of parks without private vehicle restrictions, but some portion of visitors will choose transit voluntarily without a restriction policy. Setting ridership targets according to visitation levels accounts for differences in ridership based on the number of people in the area. Transit system organizers might consider establishing a sliding scale, such that a smaller proportion of visitors will be expected to take transit in years of low visitation, whereas years of heavy tourist crowds would be expected to bring congestion to motivate people to take transit.

Beyond the numbers, transit system organizers must watch how people interact with the systems. Annual ridership surveys allow the visiting public to relate whether they have had good or bad experiences. These surveys help identify ways to improve visitor experience on transit to make transit equally or more appealing than private vehicle travel. Ridership surveys, as well as broader visitor surveys, should include questions that indicate how people find information about transit and what further information they feel they need. In this way, surveys monitor the communication programs established.

5.2.3.8. Consider Relevant Policies.

Policies affect the ability of transit systems to achieve their goals. When Springdale, Utah needed to distribute parking for the Zion Canyon Shuttle throughout the town, the Utah Department of Transportation agreed to bend its policy against parallel parking on the state road that serves as the main street in town. This supportive policy affects how and where visitors park for the shuttle. It provides more parking around local businesses, so visitors who park on the highway for the shuttle might take advantage of their proximity to local businesses to shop, eat, or avail themselves of local amenities. In this way, the parking policy might benefit nearby businesses and the local economy.

Table 5-6: Policies Potentially Affecting Transit Ridership and Travel Behavior

Agency	Policy
State or local departments of transportation	• Parking policies • Transit infrastructure development • Traffic signal preference for buses • Communication policy
National Park Service	• Private vehicle restrictions in the park • Entrance fees for transit riders • Interpretive programs along transit routes • Training and education programs for seasonal workers • Communication policy
Chambers of commerce or visitors' bureaus	• Discounted membership for businesses advertising or encouraging transit • Training and education programs for seasonal workers • Transit information dissemination • Communication policy
Transit operators	• Route design • Fare policies • Communication policy
Localities	• Zoning • Parking guidelines for businesses • Encouragement of transit-oriented development • Communication policy

Planning agencies, chambers of commerce, transit operators, the National Park Service, and other agencies can all make policies that affect transit use and have repercussions on local economies (Table 5-6). Before the start of transit service, transit system organizers should document relevant policies across all agencies. At this time, transit system organizers should look into policies in comparable communities and model sites for ideas on other policies worth considering. The local list of policies should reflect changes in policies. Records should indicate when policies begin, so future analysis can identify the influence of the policies in trend data.

5.2.4. Step Four: Design the Transit System and Communication Program.

The next step relates to the intended outputs of the transit system planning. The ability of transit systems to achieve the goals set for them derives directly from service design and resource allocations. It is fallacy to try to identify impacts without first considering the contributing factors. This study does not cover all aspects of system design, such as creating schedules or choosing between in-house operations versus the various types of contracting options for private operators; however, this discussion does address several aspects of the design of the system that directly affect progress toward identified goals of transit. Some of these aspects have not received attention in past implementation of transit in parks, yet attention to them can provide local stakeholders with important information to help them strategize how to attain the goals of transit and effect the long-term goals of the region. Notably, system and communication design follow from the identification of goals and come after transit system organizers define performance measures, so the service design evolves from an understanding of what organizers want and expect to come from transit.

5.2.4.1. Establish the Service Scope.

The various experiences in different parks do not offer general guidance for the right scope of an initial transit installation, but the transit planning process for an individual park does. Case study parks in this research started with a range of system sizes from infrequent service with few buses outside Yosemite to high-frequency service with a full fleet of new tandem vehicles in Zion. Acadia's large-scale system has needed to expand, while Bryce Canyon, struggling to support its moderately-sized system, made service reductions in the early years of the Bryce Canyon Shuttle. Each system size serves a different purpose and fits a different priority for allocating local and national resources.

Service scope needs to fit within the larger transportation planning for a park and recreational region. What portion of transportation needs should transit serve? Zion National Park wanted nearly all vehicle trips into the Zion Canyon replaced with transit, but the Yosemite's regional system offers capacity to make a marginal change in travel behavior in the region. Sometimes, a regional only needs a marginal change, and other local needs take a higher priority for resource allocation. Again, the goals of transit need to define the scope.

In most transit systems, available resources and funding will constrain the ability of transit to attain its goals; however, transit system organizers should approach the question of service scope in the opposite direction. Instead of asking how much transit a planning process can afford, the question should start with identification of how much transit partners want and how much transit the park and region genuinely need. With the scoping boundaries defined, partners need to look at what resources can come from existing sources in order to identify the difference between the resources and the service scope needed to attain goals. From that standpoint, the partners can collaborate and

brainstorm to find new funding sources. Transit system organizers of existing systems have found creative means of finding funding, and proposed legislation might result in new allocations to ease the burden of local subsidy.

5.2.4.2. Plan Routes.

Many considerations come into the design of transit routes, but the goals of the transit system must stay in the forefront of all decision-making. Among the most obvious considerations, transit operational constraints and financing define the boundaries of design feasibility. Within those boundaries, all decisions relate to the equilibrium locally determined will most closely bring the transit system to achieving its goals.

Route planning should start with what the visitors need. Overnight guests need access to the park, lodging, food, activities, and stores. In lieu of lodging, most day-use visitors need a secure place to park. All visitors need access to parks and other tourist-oriented destinations in the area.

Transit system organizers need to consider how visitors enter their recreational area. For most parks in the continental United States, the majority of visitors drive in private automobiles from metropolitan areas within one day's driving distance. Even with this large amount of private vehicle traffic, a sizable portion of visitors, such as 25 percent, might arrive by air, which makes shuttle connection to the airport (by public or private company) critical to the planning of transit routes. The importance of creating a seamless connection to an airport and other regional transportation should not be underestimated. When visitors pay a daily rental rate on a vehicle, they typically want to drive it. If they never rent the vehicle, the parking problem is reduced, and visitors will not feel anxious about leaving a vehicle far from where they are engaged in activities. Transit system

organizers should strive to create seamless transportation service from all ports of entry, including airports, train depots, and harbors.

Which businesses should transit serve? Central activity centers might do well near short-term activities, such as hiking supply and grocery stores, souvenir shops, ice cream parlors, and restaurants. Many visitors will willingly visit such places repeatedly as they go to and from the bus stop each day. Gateway communities outside Acadia and Yosemite National Parks have primary transit hubs or stops near existing or planned movie theaters, which makes less sense. Movie theaters do not attract impulse activity throughout the day, so visitors would likely benefit more from different land use surrounding major transportation centers, while movie theaters sit at another dedicated stop along a route.

Some stops might serve non-tourist destinations. Transit operators have found that employees regularly use shuttles that go between businesses and parks for their daily commutes; therefore major employment centers might make logical transit stops. Even stops that only serve employees help visitors because employees who ride the bus do not clog the roads, take parking spaces, or pollute the air. Route designers need to think about what the locals need to keep their vehicles off the roads and out of the parking lots.

Before the start of transit service, transit system organizers typically have a strong sense of major destinations that need transit service. Automated data collection can confirm or deny local perception. With trail counter technology improving in recent years, getting information on heavily used backcountry trails can help parks understand demand for trails and plan transit to accommodate demand with sufficient transit capacity. Visitor surveys can provide similar information both in parks and in gateway

communities. Again, such data collection should start before starting or changing transit service, so data over time can indicate changes in trail use based on transit decisions.

To the extent possible, transit design and planning should reflect awareness of local economic issues. The Zion Canyon Shuttle turns around at a boarded-up building, which reflects poorly on the local community. Customers of the lodge and restaurant across the street must cross a state highway to access the shuttle stop, and shuttle riders get a prime view of a boarded building, which does not represent the economic vitality of the rest of the town. Image is particularly important in communities oriented toward the tourism industry, but the transit operator, who would prefer to turn around at the active lodge across the street, designed the route this way because the lodge's steep parking lot slope does not allow safe and easy bus access. In this case, transportation engineers, road designers, and the business owner need to get together in partnership to change the design of the parking lot. The business owner would need to absorb this capital expense, but the resulting service will better accommodate customers of the lodge and restaurant, as well as the image of the gateway community.

Finally, most discussion of route planning centers around visitor demand, but capacity also needs to enter partner discussions. The National Park Service has conducted research in recent years to begin to define the capacity for natural resources to handle crowds of visitor demand. Transit can expand the number of visitors who can access attractions, but it cannot expand the ability of natural or cultural attractions to sustain high numbers of visitors. A handbook on *Visitor Experience and Resource Protection (VERP) Framework* provides guidance on how park planners can evaluate

facilities and resources and for managing demand to stay within park capacity, even after parking lots cease to define capacity (*103*).

Once transit system organizers have defined the guiding principles of route design, several fundamental decisions will affect the details of the design. Partners need to make considered decisions about parking plans, stop structure, frequency and reliability, and technology architecture. These elements will heavily influence the way visitors interact with transit systems.

5.2.4.3. Create a Parking Plan.

Parking plan models affect the way that visitors interact with transit, transit destinations, and local businesses. Bryce Canyon and Zion National Parks, two parks in close proximity to each other which both started transit operations in the same year, illustrate fundamentally different philosophies for transit parking plans.

At Zion, private vehicle restrictions requiring almost all visitors to park and ride to the main attractions of the park created need for a large number of parking spaces near the park entrance. Pushing vehicles out of the park's canyon required cooperative planning to keep the vehicles from inundating the town. Just inside the park entrance, Zion National Park built a parking lot with 400 spaces, and the community provided an overflow parking lot just outside the park. Visitors fill the lot inside the park before turning to the overflow lot. When vehicle queues at the park entrance get long, rangers walk through the line of vehicles and suggest drivers consider using the overflow parking area, but these two lots do not have sufficient capacity to handle all visitors at peak times. The most efficient parking and traffic strategy for the area is based on getting people to leave their vehicles parked at their hotels or in town. While planning for the new traffic

management strategy, local leaders asked how many spaces each business could dedicate for park and ride. Many businesses donated small numbers of spaces, and the Utah Department of Transportation allowed parallel parking on the state road traversing the town, adding up to a viable parking capacity for the town (500-700 parking spaces spread across town and at individual businesses). In the first year, most visitors still competed for the limited spaces in the park, but through communication and education in the community and in the park, local leaders perceive that in subsequent years, more visitors have parked in town and taken the town shuttle loop to the park. Ridership data confirm that perception.

In contrast to Zion's approach of integrating shuttle parking in the gateway community, Bryce Canyon National Park chose to create a dedicated facility for park and ride. The Bryce Canyon Shuttle incurs $300,000 annually in rent for a staging area built specifically to serve transit passengers. The location of the staging area adds to the cost of the transit contract. Situated outside the park and past the first commercial area, the staging area also adds an extra half mile onto every transit trip. In the third year of the contract, Bryce Canyon National Park opted to keep the gate locked on the staging area to cut operating costs, even though the contract still required the $300,000 rent payment for the year. This staging area offers a secure place to leave vehicles, restroom facilities, and general information on the park, but on the downside, the staging area defeats one of the well-documented benefits of transit: where people change modes of transportation, commerce has an opportunity to develop. People are far less likely to get off a bus for the purpose of buying a trinket or trail mix than they are to stop in a store while they are

waiting for a bus after they get out of their cars. With no businesses around the parking lot, the staging area curtails potential economic benefits to the gateway community.

The Zion model has advantages beyond saving the $300,000 annual cost for facility rental. Commercial development occurs naturally where people change modes of transportation, as evidenced by hotels and restaurants near airports and the historic development of metropolises at major ports. Putting shuttle parking near businesses encourages people to wander into businesses while waiting for the bus or after they get off the bus. Impulse-oriented businesses can do particularly well in such settings. For instance, someone waiting on a hot day might be inspired to buy an ice cream or fudge, whereas, the same person might not feel inspired to make a photocopy or send a fax. Furthermore, areas with air quality concerns where every vehicle start exacerbates a pollution problem should consider the philosophy of leaving cars parked at hotels and recreational vehicles (RVs) parked at campgrounds.

5.2.4.4. Determine the Stop Structure.

The stop structure will largely follow from priorities already decided, such as where parking exists and whether businesses need to pay to have the bus stop in front of them. Common sense can also dictate many of the decisions, such as putting stops near major activity centers (scenic attractions, large hotels, or popular restaurant areas) and avoiding places that contain safety hazards. Depending on the level of analysis capability available to transit planners and the size of the gateway community, it might make sense to geocode the business list to look at the locations in a computer analysis with geographic information systems (GIS) that can determine where stops would serve the largest number of tourism-oriented businesses.

Transit planners need to decide how and when to use flag stops versus fixed stops. Fixed stops should have infrastructure to identify them and provide amenity for visitors (seating, shelter, information on routes and departure times, emergency telephones, and so forth). Fixed stops serve as places where passengers gather; therefore, they bring people together with an opportunity to circulate around and in nearby businesses while waiting for the bus. This circulation brings a locational advantage to adjacent businesses where visitors can window shop and make impulse purchases, such as souvenirs and ice cream. Businesses with goods typically requiring more premeditation, such as lodging or dining, have a marketable advantage of close proximity to fixed stops. In contrast, passengers only use flag stops with premeditated intent to visit a site and businesses or attractions in close proximity. Flag stops, which require no infrastructure, serve all business along routes equally, but a mix of fixed and flag stops results in uneven access to businesses because passengers will rarely use the flag stops.

Flag stops require visitors to trust in a system they have not seen and might not fully understand. They have only one or two days of vacation, and they need to get from one place to another. Someone tells them that if they stand on the roadside, a bus will come with a friendly driver who will see them and stop. Do they believe the bus will come? Do they believe the bus will stop at a place where nobody built any benches? They do not know the area… can they feel sure they are standing where the driver will see them? Would it be easier just to take the car?

Flag stops do make sense where land use does not provide locations of clustered visitor activity, as on Highway 6A in North Truro on Cape Cod, where bus riders come

from any one of a number of single-unit cottages along miles of road. With no clustering of visitor destinations, no strong potential locations for fixed stops exist.

Overall, bus stop planning should consider visitor convenience, transit efficiency, equity, and pragmatism according to available resources. In locations with long distances between attractions or businesses, long route distances make it difficult to achieve balance with all of these factors. Partnering discussions will need to begin with prioritization of goals and result in an understanding of the compromises accepted to achieve a feasible system and consensus among partners.

5.2.4.5. Consider Frequency and Reliability.

Although transit systems in parks and gateway communities are generally designed to serve people on vacation, the passengers do often have sensitivity to time. People have to arrive in time for shows, dinner reservations, and the departure of a ferry or airplane. If a family comes off a trail with hot and hungry children with headaches, time becomes a critical factor. No one wants to spend a vacation worried about missing the bus or waiting at a bus stop. The Yosemite Area Regional Transit System (YARTS) runs every two hours and twenty minutes, and because the buses run on twisting mountain roads, the drivers do not allow people to stand in the aisle. If the bus has a full load on peak runs heading out of the park, passengers receive instructions to wait another two hours and take the next bus.

Transit administrators must strike a delicate political balance between frequency and cost. High frequency will make the system more attractive to visitors, but decreasing the time between buses can add substantial cost to a transit contract. Convenience goes hand

in hand with frequency, and people will choose to ride a bus rather than take a car if they find riding the bus more convenient than driving.

Transit professionals typically regard service frequent if a bus comes every ten minutes or fewer (*104*). When buses come every fifteen minutes or more, people start feeling the need to see a schedule and plan their trips. Many transit system organizers falsely believe they have frequent service when their buses depart only every twenty minutes. Zion National Park has truly frequent service with buses running every six minutes at peak. Distance is an important consideration in determining an appropriate frequency. The Zion Canon Shuttle covers only a six-mile road, whereas trip times on the full YARTS trip between the Yosemite Valley and Merced take three hours from end to end on an 80-mile route.

For the Provincetown-Truro shuttle at Cape Cod National Seashore, people complain most about a lack of reliability. Buses there run on a twenty-minute headway, so a missed run can mean substantially missing appointments. Local businesses complain that unreliable service means employees do not arrive on time for shifts. All of these problems affect the tourists, the employees, local businesses, and the reputation of shuttle systems in gateway communities. If local conditions, such as traffic or employee dependability, make reliability difficult to ensure, then increasing frequency could help. If buses depart every six minutes and one run is missed, it is less important that a missed run on a twenty-minute headway.

5.2.4.6. Establish Technology Architecture.

Not all parks will manage to implement a full-scale architecture of intelligent transportation systems (ITS) in the first year of service. Most transit plans need to

establish a phased program of introducing technology to manage traffic and facilitate transit use. Based on the lessons of the Island Explorer in Acadia, transit systems should start with at least a basic system of two-way radio communications on buses. To allow central control of the service from the dispatching office and to provide a central point for collecting information to answer visitors' questions about the arrival status of buses.

5.2.4.7. Develop Communication with Local Businesses, Governments, and Planners.

The partnerships established in the first step of this performance monitoring process must interact dynamically with true multi-directional communication. In other words, the partnerships cannot exist merely on paper, and communication in partnerships must mean more than one party informing others of project status and activities. Partners in the process must have ability to introduce their needs into planning and to influence service design. Part of gaining this ability requires information dissemination and education, such that all partners can offer the most valuable input possible. For instance, local businesses need to information on what to expect and how to create benefit or mitigate negative impacts of transit or transportation technology. If business owners receive education on what they can expect and what is happening, they will respond with more of a sense of involvement and command of the situation.

Current research on national parks is developing a body of information on the transit experiences of parks and gateway communities, but many people both in remote communities and in big city neighborhoods do not know the information exists. Many gateway community residents and even park employees have limited awareness of the experiences elsewhere in the nation or of how that experience relates to them. Central offices in the National Park Service are working to generate more research, and this

research must be made understandable and accessible for people working in the field with little or no experience with transit. If people are informed, they can make educated decisions, brace themselves for changes, and work to build a system with maximum benefits. Informed stakeholders make for dedicated partners.

To make transit planning successful, individual businesses in the communities need to understand what is happening, how to take advantage of it, and how to communicate it to their customers. This level of partnership with small businesses throughout the communities requires more than a short e-mail list and established committee meetings. It requires communication, published materials, and information sessions. It requires explanation on many different levels and to many diverse interests. It requires reaching business owners who might not be able to make it to information sessions, and it requires training seasonal employees throughout the communities on how to explain the transit systems to visitors.

For many parks and communities that have implemented transit, the communication program comes has an afterthought, if at all. Perhaps the lengthy collaborative process leading to transit implementation feels like such an exercise in communication with so many differing interests that planners find it unimaginable that the whole community is not already involved, but planners cannot afford to let communication fail before it reaches the grass roots where communication with visitors occurs. Outside Zion National Park, ridership in the gateway community increased in each of the first three years of operations, and many local participants in the process attribute the ridership gains to increased education of staff in town businesses. Before the communication and education programs started, almost all visitors drove past the bus stops to sit in queues at

the entrance gate, so they could park in the lot inside the park. Outside Acadia National Park, business owners did not see value in an intelligent transportation system (ITS) program, which limited the ability of the system to impact circulation. Until businesses start logging onto the Internet and giving their customers access to information on when the next bus will arrive, the benefits of a system that will keep people patronizing shops in town rather than standing at the bus stop will not be realized.

5.2.4.8. Use Multiple Media for Visitor Information Dissemination According to Local Needs.

In any communication program, developers must recognize that different groups of people will respond to different media. Local newspapers and public meetings help to reach people who get information in traditional ways. E-mail can reach targeted groups of people, and web sites offer a means of reaching a broad audience without regard for physical distance. The stakeholders in the Zion Canyon Shuttle planning process found that seasonal employees throughout the local gateway community need training in the spring to answer questions about the shuttle service, so Zion National Park agreed to help stage training sessions to prepare people throughout the community to give accurate information on the shuttle system to visitors. Based on findings from several park transit situations, Zion's annual community training sessions set a useful precedent that will fit well in most transit planning processes.

Planners for each locality need to tailor communication programs to their own situations. Many parks have used visitor surveys to learn how visitors get information on their recreational regions. These data have indicated that the widening use of the Internet gradually changed the sources people use to get information, particularly since the late 1990s. On the other hand, traditional media, such as tourism guidebooks and telephone

inquiries continue to influence vacation planning. Transit system organizers should design public communication programs informed by research on the reach of different media, and that research needs to stay updated through regular visitor surveys.

5.2.4.9. Establish Transit Presence in the Visitors' Experience.

The importance of presence cannot be overstated. If visitors see a system visibly everywhere they go, they will understand that it will take them everywhere they need to go. Presence need not mar the scenery. Carefully designed infrastructure can "sit lightly on the land," as the National Park Service has tried to do with all facilities for a century, but bus stops should stand noticeably against their backdrops. They should also conform to design guidelines established locally, such that visitors come to recognize what to expect to see at a bus stop and how to identify stop locations. Brochures at hotels both give information and bring the system to visitors' attention. Buses need clear markings, so visitors understand the difference between tour buses and public transit and so visitors notice the buses in the places they visit. Seeing that the buses go wherever visitors go will make people realize the buses will serve their needs. National Park Service AM radio announcements can introduce visitors to the concept of public transit from the moment they arrive in a park region. All of these tools and other media used locally advertise transit and build visitors' confidence in the shuttle system. If visitors do not see a transit system, they will not ride it.

5.2.4.10. Overall Design

After the individual pieces of transit design have received thorough attention and discussion, the resolution of the design phase cannot occur until all of the pieces come together for review as a system. Transit system organizers, who have likely immersed

themselves in necessary details, must meet and review the planning process results as an overall system. Primarily, this review must address two fundamental questions:

- Will this system meet the goals set for it?
- What level of performance should the system deliver toward those goals at different points in time?

If transit system organizers find that final consensus on each individual piece of the service design has resulted in a feasible transit service that fails to achieve its intended purpose or make progress toward goals in a reasonable time frame, the organizers must revisit the design until they arrive at a solution of merit.

5.2.5. Step Five: Consider Available Resources.

The outputs of transit service planning must conform to available resources. Economic impacts of transit come in two forms: outlays and income, and the extent of the outlays for transit systems has surprised many of the parks and communities inexperienced with transit service planning. This discussion of procedures focuses on how to proceed based on decisions made, but transportation planners should carefully consider available funding as a factor in deciding what type of system will best achieve defined goals, given well-defined constraints. The Federal Highway Administration has provided information on funding sources available in its resource guide for transit on public lands (*105*).

The topic of transit funding and resources available for transit on recreational public lands merits large-scale research beyond this scope of this study. To date, transit system organizers have had to muddle through a series of small funding opportunities and restrictions on where moneys can and cannot contribute to transit efforts. Many transit

systems have a large number of small funding sources, requiring extensive administration work to secure and track tenuous funding streams. The uncertainty of funding for transit on public lands has resulted in changes in some service deigns; in other cases, transit system organizers have leapt forward without the security of an assured financial net.

Resource availability can shape many different aspects of the design and operations of transit service. In most cases, transit system organizers must reduce the scope of their desired transit systems to operate within an available budget. Many stakeholders do not understand the trade-offs between service frequency, ridership, and the marginal cost of adding a transit run. If a system sets a ridership goal, but reduces frequency due to budget constraints, the system will likely fall short of its ridership goal. In this case, budget resources must shift to operations, additional funding must come available, or system designers should adjust the ridership goal to a phased system of low initial ridership with increasing ridership as the proven system attracts additional financial resources.

Dedication of resources to the wage structure for shuttle drivers has important implications that transit system organizers should consider for short and long-range impacts. The experience in Zion and Bryce Canyon shows that using federal wage structures can attract large numbers of applications for driver positions, and Cape Cod has shown that lower wages insufficient to sustain the cost of living in an expensive recreational area leads to staffing problem. In the short run, offering high wages appears appealing; however, Denali's situation shows that the federal wage rate can grow untenably expensive. Would a long-standing low wage rate for drivers have served Denali better by creating lower expectations for the workforce? Did Denali need the

higher wage rate initially to attract the workforce? Would the workforce in Denali stand in a better situation with a steadily climbing wage rate over time or with a high wage rate for the first twenty years of service followed by wage cuts through privatization? Without readily available answers to these questions, transit system organizers for new transit systems must at least consider the issues of wage rate affordability versus the creation of a sustainable workforce.

Beyond line items, such as worker wages, transit system organizers must seriously consider overall budget structure. In particular, they need to agree upon a strategy for creating the best balance of operating and capital expenditures. The case studies revealed that this balance does not receive much direct attention in most transit systems. The National Park Service needs to address this issue at the national level, in guidance for park units, and within specific local transit planning processes. As guidance, the National Park Service should look to the Federal Transit Administration (FTA) and the American Public Transit Association (APTA) for examples of budget structures for transit systems across America.

5.2.6. Step Six: Test and Implement the Performance Monitoring Program.

With partners, goals, service design, and resources in place, the performance monitoring program can offer preliminary measures of how certain levels of inputs create measurable outputs that result in degrees of attainment of desired and undesired outcomes. In the stakeholder-rich environment of park transit, performance monitoring programs involving multiple entities will likely behave differently than expected in design. Transit system organizers need to plan extra time for establishing baseline measurements for a performance monitoring program. Collecting baseline data will

provide a test of the performance monitoring program and its participants, and adjustments will often occur. Baseline data gathering will give a strong indication of the ultimate recurring costs of a performance monitoring program, which will likely exceed expectations; however, the costs of the performance monitoring should justify themselves through increases in management efficiency. After completion of gathering baseline data, performance monitoring programs should enter routine operations for participating stakeholders. Discussions among transit system organizers must follow regular reporting.

5.2.7. Step Seven: Monitor and Report Performance.

With goals identified and designs complete, transit operations should begin with the performance monitoring system in place to calibrate and examine levels of inputs, outputs, and outcomes. The collection of trend data will largely follow the methods established for baseline data collection.

Too often, funding for projects ends on the day the project is completed, never allowing resources and time for review of the project and proper adjustments. In transit projects where the effects will be felt by so many stakeholders, project review and adjustment is critical. The planning process must contain funding for follow-up surveys to understand how the project has impacted the various stakeholders, and resources must remain available to undergo committee meetings and a process of review and revision to mitigate identified negative impacts and encourage identified positive impacts.

5.2.8. Step Eight: Integrate Results into Transit Decision-making.

Understanding the outcomes that resulted from the inputs used, the feedback iterates back to re-calibrate the inputs for transit systems. Upon the release of performance

monitoring reports, local stakeholders should meet to evaluate the results, discuss their implications, and make appropriate modifications. The data will stimulate public discussion and dialogue among stakeholders. The results will indicate where transit efficiency can improve and where transit system organizers might want to adjust the balance of resource dedications.

Transit system planning and the initiation of transit service will require substantial time commitments from participating stakeholders. Demands for stakeholder participation will decrease as system operations grow routine; however, dedication to both initial efforts and continued review through the years of operations must come from all stakeholders to ensure a system that operates efficiently and provides an attractive high-quality experience for visitors.

Beyond local stakeholders, performance monitoring results should also go to the Alternative Transportation Program office in Washington. From this central location, managers can interpret the results of multiple transit systems and use this comparative perspective to offer ideas for improving the performance of transit systems as they progress toward meeting their goals.

5.2.9. Step Nine: Review and Update the Performance Monitoring Program.

Just as the results of data collection lead to adjustments in transit service and communication systems, data collection results will also show strengths and weaknesses of the performance monitoring program itself. Stakeholders should meet after baseline data collection with a specific agenda to review the value of existing information, the cost of obtaining that information, and other information that should be gathered.

Effective transit planning requires partnership participation and contribution from all relevant stakeholders; monitoring the many facets of transit systems requires similar dedication of partners. If any stakeholders choose not to participate in data collection, then out of respect for other stakeholders, the question should be raised in a meeting of transit system organizers to evaluate the value of the relevant data and the possibility of another stakeholder assuming responsibility for data collection and/or reporting.

5.3. Procedure Implementation and Iteration

Reliable performance monitoring requires dedication of resources, close attention to the calendar, and the flexibility to make necessary program changes. From the early planning stages of transit initiation or expansion, transit system organizers need to consider information needs and dedicate resources for designing the performance monitoring program and collecting baseline data before the start of operations.

Data collection must adhere to a strict calendar. Baseline data collection needs to occur before the start of transit service, so transit system organizers can understand the full impact of the introduction of transit. Data collection should occur again in or after the first year of operation to provide basis for critical adjustments to service offerings.

After the intensive efforts for baseline data collection and startup performance monitoring, taking performance measures should occur regularly. Many traffic counting programs provide data every year. The community and visitor evaluation steps need to be repeated in the third or fourth year of transit service and should be repeated every five years thereafter. This evaluation will allow stakeholders to identify trends and act on them according to the needs of parks and park regions. Visitor surveys should occur every five years because transit service contracts typically undergo critical review for

renewal every five years (many contracts have a five-year lifespan with five one-year options for renewal… a total of ten years). The regularity will allow trend tracking, while the infrequency of this timeline will only require a small amount of effort from park personnel and visitors.

Transit system organizers should review the performance monitoring schedule as they review the performance monitoring system; however, changes should receive careful consideration. On one hand, changing the schedule could save money. Data collection every five years might suffice for some data slotted for annual collection, particularly if collecting those data incurs high costs. Similarly, transit system organizers might feel they could improve their offerings if they collect and review some data more regularly. On the other hand, changing the data collection schedule can affect data comparability. Time of season and time of day can matter because visitors of different demographics circulate at different times.

The entire process flows from first identifying relevant stakeholder interests, their goals for transit, and external effects that will touch them. The system design emerges based on the outputs (system frequency, bus technology, communication plans, and so forth) that will yield outcomes conducive to achieving the goals. Notably, this process, illustrated in Figure 5-2, never ends: goals, desired outcomes, and actual outcomes will change over time. Transit system organizers should proactively revisit the transit planning and performance monitoring processes.

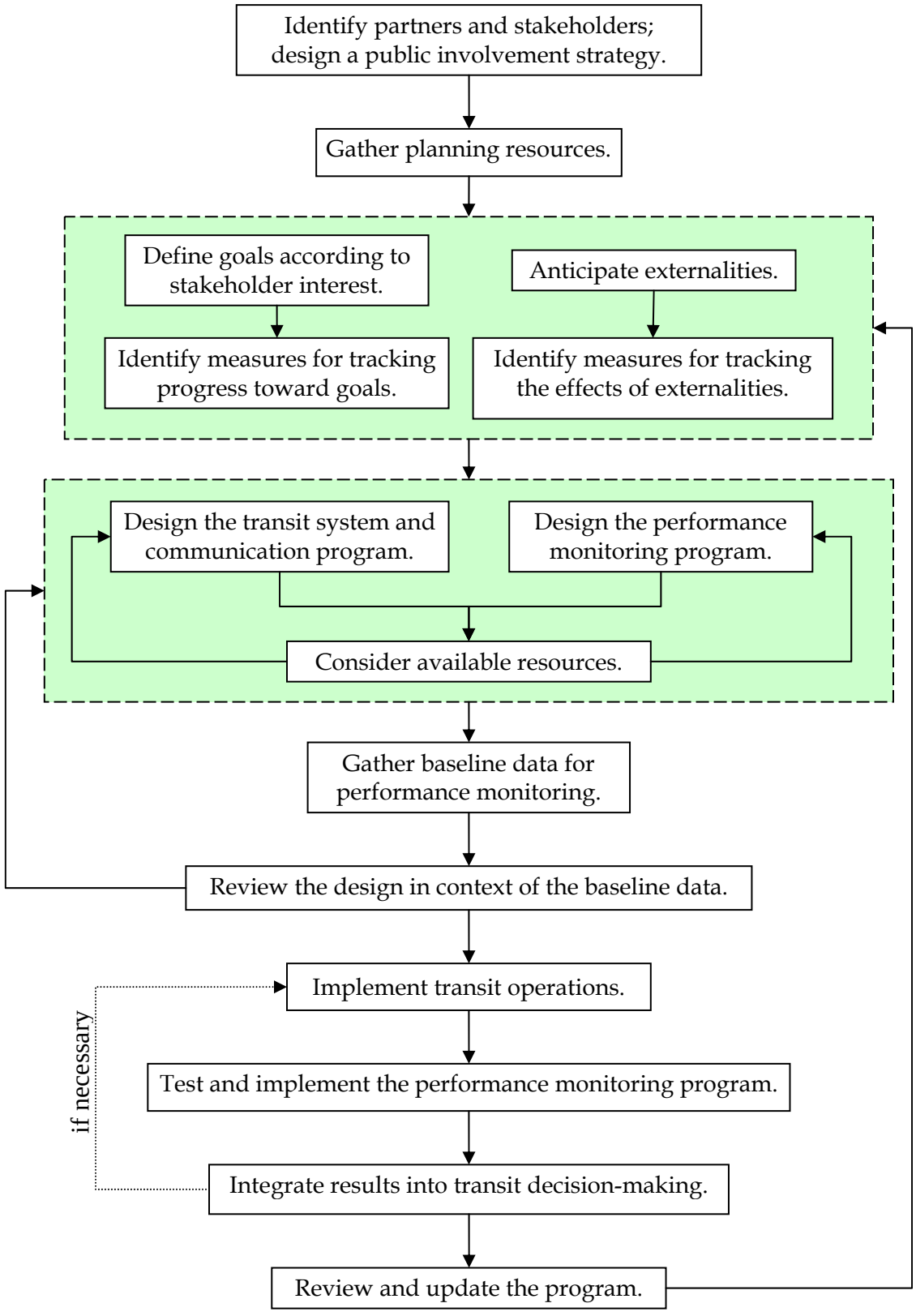


Figure 5-2: Sequence of methodology implementation.

The procedure described here will not guarantee that transit systems will attain goals set for them, but this procedure will identify shortfalls and exceptional performance toward goals to allow transit system organizers to help modify designs or reallocate resources. Design affects needed budget, and real budget affects design. Everything affects ridership, and ridership affects everything. Changes in one area need to be evaluated against all others. The process requires iterations to achieve and maintain an acceptable equilibrium.

5.4. Long-range Recommendations

Both parks and gateway communities should take steps that complement transit initiatives to reach regional goals. Typically, the goals of transit, such as reducing congestion and environmental impacts of tourism, stem from growth in visitation. The ways in which the built environment and visitor handling systems in parks and gateway communities channel visitor movement constantly affect how visitors impact the region and environment.

Gateway community leaders need to consider their land use policies and urban design. If communities allow business to grow in strip development along highways, visitors will need vehicles to access area resources and amenities. Transit cannot meet these needs cost-effectively if the development spreads over long distances because increased distance on transit routes means increased operating costs for routes and a need for more vehicles and more drivers. Alternatively, development around transit stops can put complementary businesses, such as restaurants, hotels, and gift shops, within walking distance of each other. In this scenario, visitors have easier access to local amenities, and they spend less time looking for parking or going from one place to another.

Complementary businesses receive the benefits of sharing customers through agglomeration. Policy makers in gateway communities should familiarize themselves with current literature on transit-oriented development to see how modern principles for integrating transit into community development can apply within local community character to facilitate pedestrian and transit mobility.

For local residents and businesses, demographic and real estate trends will probably take a few years to become noticeable. Real estate trends, in particular, might be difficult to attribute to transit, as opposed to other influences in the area, such as the various changes in park policies over the years. Individual parks and gateway communities might find that they have specific questions they want to address through an analysis of local demographics or real estate trends, but transit system organizers probably need not establish a regular program of such studies.

Parks also hold responsibility for creating internal systems to reduce crowding and the impact of peak visitor demand. In many parks, large percentages of visitors go to the same destinations. For instance, most first-time visitors to Yellowstone National Park will likely visit Old Faithful. As a result, these destinations receive large crowds, which results in parking congestion, wear on the natural resource, and a diminished visitor experience due to perceptions of crowding. Meanwhile, other attractions in parks might have capacity to handle far more visitors than appear. Why do visitors crowd around certain attractions and ignore others? In the case of Old Faithful, reputation and word of mouth largely contribute to the phenomenon; however, in other instances, park policies might encourage the crowding. Rangers and park staff at entrance gates often direct visitors to a small number of attractions, and crowds of visitors follow those

recommendations. Policies for spreading visitor demand can take the simple form of instructing seasonal employees to rotate among two or three site recommendations. For example, the first car at the entrance gate hears about attractions A and C, the next car hears about A and D, and the third car hears about B and C. Consequently, if A has traditionally received all three cars, it now only receives two-thirds as many. Glacier National Park identified the need to level the use of park resources in its *Transportation and Visitor Use Study* for the period of rehabilitation of the Going-to-the-Sun Road. This plan establishes "use leveling" as a means of reducing congestion and crowding during a period of reduced access and mobility in the park (*106*). Other parks can extend this concept to handling typical surges and spikes in visitation.

Long-range planning can create substantial impacts on the goals of transit, but identifying the outcome of long-range planning requires a different approach than the performance monitoring discussed in this chapter. Performance monitoring has an inherently short-term focus, providing a snapshot of current conditions and offering data for trend analysis over years. Dedicated research projects typically identify long-range impacts of land use and visitation management policies. Parks and gateway communities should establish connections with planning professionals to help them define and refine policies to fit local community character, and after new policies have had sufficient time to manifest in tangible differences, the results should appear in a commissioned study for local refinement and for the reference of other parks regions.

5.5. Future Research

The results of this research suggest areas of further research.

5.5.1. Local Impacts

5.5.1.1. Econometric Modeling of Transit's Impacts on Visitor Spending

Many agencies and stakeholders in parks have posed the question in recent years of transit's ultimate dollar-figure impact on visitor spending. Establishing econometric models of the direct, indirect, and induced impacts of transit in parks will most likely require costly data collection to create models only calibrated to a given park under analysis; however the strong interest in this subject merits analysis by modeling experts to attempt to address the question. The Task Force on the Transportation Needs for National Parks and Public Lands in the Transportation Research Board (TRB) is currently proposing a research statement to expand knowledge of the direct, indirect, and induced economic impacts of visitor spending in reaction to the introduction of transit in parks.

5.5.1.2. Geographic Analysis of Transit Service Equity for Businesses

Transit planning inherently requires a geographic component. Research has found that people will typically walk no more than a quarter mile (*104*). Businesses with front-door transit service receive far more benefit from transit service than businesses located just a third of a mile from a bus stop.

Knowledge of the economic impacts of transit in parks on gateway communities needs to extend beyond its current level to incorporate this important geographic component. Which businesses have front-door service? Which ones have a transit stop within one tenth of a mile and other increments of distance? Which ones sit within walking distance of a bus route for shuttles operating on a flag-stop system?

Analysis through geographic information systems (GIS) will provide an important characterization of transit service equity for gateway community businesses. What

proximity do large or small businesses have to transit service? Do certain business sectors benefit more than others from public investment in transit? Manipulation of tabular business list data should provide meaningful categorization of businesses, building off of the division of sectors presented in this research and the NAICS/SIC coding developed in Appendix A. The U.S. Forest Service's IMpact analysis for PLANning (IMPLAN) model also characterizes businesses in a way that could provide meaningful results in this research. In addition to the spatial and tabular analysis of data, the research product should review literature and experience with transit-oriented development and urban design for communities comparable to gateway communities. The findings of this study will provide guidance both for transit route planning and gateway community economic development planning.

5.5.1.3. Business Experience with Intelligent Transportation Systems (ITS)

Intelligent transportation systems technology is making inroads into parks and gateway communities, but in most cases, local residents and businesses have little understanding of the impacts of transportation technology and the potential to use it to achieve benefits in local economies. Research on the ITS system at Acadia National Park has shown that 80 percent of shuttle riders make the decision to ride the bus at least in part based on seeing real-time departure signs. Visitors reported that intelligent transportation systems saved them time, and those people using the technology stayed in the local area longer than visitors who did not use it (*107*).

Findings from the experience at Acadia raise further questions. For instance, do technology users stay in the area longer, or do people who stay in the area longer use ITS? This question has important implications to gateway community businesses who would

like to find ways to make visitors stay in the area longer to support local establishments. Research also still needs to target businesses directly affected by intelligent transportation systems. At Acadia, these businesses might include downtown businesses where customers have historically had difficulty finding parking to access the businesses. When parking technology directs people to satellite parking, it might have a positive economic effect on businesses near that parking area and a negative impact on businesses near the traditional parking area. Conversely, the businesses near the traditional parking area might receive more customers through redirected vehicles and transit access than would be possible with congested traffic and no parking information.

A study into local business experience with intelligent transportation systems will build upon results already discovered for the economic impacts of transit in parks. The results of this research will likely affect local support in gateway communities for proposed intelligent transportation systems for park regions.

5.5.1.4. Investigation into Transportation's Impact on Visitor Experience

Many people have speculated on the impact of transit on visitor experience, but rigorous research has not yet addressed the question. Ridership surveys at individual parks with new transit systems showed that visitors approve of shuttles, but these surveys do not ask how the visitor experience has changed. Parks with private vehicle restrictions report that visitors sight more wildlife because private vehicle traffic does not scare animals from the road. Does the relationship of number of vehicles to number of wildlife sightings lend itself to quantification and analysis? Do wildlife fatalities correlate?

Both perceived and actual impacts matter to visitors, parks, and gateway communities. A number of data sources can contribute to this study:

- Ridership surveys have demonstrated overwhelming approval of new shuttle systems. Consolidating ridership survey results over time and from different parks can indicate what works well for visitors and what improvements to transit service can improve visitor experience.
- Visitor use surveys will indicate people's transportation decisions in parks and their opinions of transit systems they have encountered.
- Beyond visitor surveys, a random survey of American households can indicate if the presence of transit affects people's decisions whether or not to visit parks. This survey will also help identify the concerns that might make people choose not to use park transit.
- How else does the presence of transit affect travel planning? Tallies of people who call and ask about transit systems and counts of park transit web site hits relative to hits on other sites associated with parks can inform the question of how much people pay attention to the presence of transit. Deployment of traveler information 511 services will lead to similar opportunities for spreading transportation information in and around parks, as well as creating a source for information on the questions visitors have and how well existing systems suit their needs.
- From the topic of wildlife sightings follows investigation into wildlife fatalities. If animals come closer to the road, do more of them die in traffic crashes, or does reduced traffic reduce the fatality rate? This research can build upon ongoing research projects for reducing wildlife fatality on roads throughout North America, such as the Midwestern states information source at

http://www.deercrash.com and current research into wildlife ecology and roadways through the National Cooperative Highway Research Program (*108*).

The results of this study will help parks, park transit operators, and gateway community businesses expand upon the transit's improvements to the visitor experience and address concerns or problems. The study should identify differences between perceived and actual changes to the visitor experience. Subsequently, the study should recommend ways to bridge the gap between perception and reality through consistent communication, such as a standardized transit template for park web sites.

5.5.1.5. Ridership Sensitivity to Frequency of Park Transit Service

System organizers for transit in parks have demonstrated a lack of awareness of the interaction between service frequency and ridership. The Transit Cooperative Research Program (TCRP) has established level of service (LOS) standards for various frequencies of service (*104*), and transportation literature has found some indications of the elasticity of transit riders to service frequency (*109*).

On a fundamental level, park transit system organizers should use the information available from the state of the practice in existing transportation research; however, questions arise about the uniqueness of the recreational context. Do people on vacation have the same sensitivity to time that commuters have in their daily lives? People on vacation do have time constraints for restaurant reservations, golf tee times, and airline flight schedules; on the other hand, they should feel more relaxed about their schedules as they get away from day-to-day pressures. Beyond the context of time sensitivity based on trip purpose, the character of park visitors might have an unusual quality. Do urban

people visiting rural parks display the time sensitivity of urban dwellers, or do they adopt a more rural pace of life for their vacations?

This research should use visitor and ridership surveys to discover people's stated and revealed sensitivity to transit frequency. Characterizing riders based on a variety of demographic and trip-oriented factors, the information gathered in this statistical study will help transit system organizers understand the tradeoffs they make between frequency, its associated costs, and ridership, such that transit systems can become as economically efficient as possible while achieving targets established for the goals of shuttle service.

5.5.1.6. Transit Needs and Impacts for Parks in Urban Areas

Studies on park transit have focused largely on rural parks, but the National Park Service operates many units in major metropolitan areas, and these units have their own transportation problems and needs. Parks operate or contract shuttle systems in several urban parks.

Researchers of park transit in urban areas will encounter a number of unique situations. In a research sense, observations in these diverse areas could have many influences other than park transit, which makes conclusions difficult to form. In terms of context, several new types of questions arise. Do visitors consider the identification of buses as part of park transportation important, or will they ride municipal transit equally willingly? How well does cooperation with local transportation agencies work? Do they serve parks sufficiently with local transit? If gaps in service exist, can they be characterized? Given that park transit in small towns provides a notable improvement in mobility for transit-dependent populations, would park transit in urban areas make an

equivalent difference? Who rides park transit in urban areas? Does park transit in urban areas accommodate mostly park visitors, or do local populations use it?

Case study investigation into urban park transit will expand knowledge and inform park transit practice. This research will facilitate decisions for partnering, planning, and financial allocation.

5.5.1.7. Partnering with Transportation Providers

The National Park Service has conducted research and produced policy documents on the benefits and best practices of partnering. The resulting reports typically identify the practices and participants for given parks. Future development of this research area should build upon findings that local transportation providers experience noticeable impact from the introduction of transit.

Different types of transportation providers have found a variety of ways to support or partner with park transit systems. Tour bus and taxi cab operators find that their customers use shuttles, but expanding the transportation capacity of parks and gateway communities can results in a larger potential customer base. School bus drivers find summer employment with shuttles operating during the peak recreational season. Transit operators exchange vehicles between parks in the summer and ski resorts in the winter. Seasonal transportation systems need this type of dual use of human and physical resources to make transit service feasible and affordable.

Research on this topic should involve investigation into the experience of local transportation providers associated with several parks. All relevant transportation providers, including small entrepreneurs, transit operators, and local agencies sharing

resources, should appear in the study. Surveys and interviews will identify practices, opportunities, and experiences to date.

5.5.2. Park Funding and Allocation

5.5.2.1. Transportation Funding for Public Lands and Recreational Communities

The National Park Service and other public land agencies struggle with the question of how to fund transit and other alternative transportation programs. Transportation funding has evolved from the first director of the National Park Service pursuing transportation appropriations by getting the cars of Congressmen trapped in the mud of unimproved roads nearly a century ago to earmarks for transportation research in the *Transportation Equity Act for the 21st Century (TEA-21).* Despite the obvious improvements in methods for attaining funding, transportation funding needs for public land agencies remain unmet.

Research needs to define the historical and current state of funding allocated to public land agencies. How are parks doing it today? How fragmented are the funding sources? What role do individual park units versus the central Washington offices take in seeking funding? Do public land agencies have dedicated people tracking funding opportunities? Do parks compete with each other or collaborate? How can the system be streamlined?

This study should move beyond a focus on public land agencies to a broader investigation of the basis for transportation funding allocation. The current basis of awarding funding according to residential population fails to fails to meet the needs of situations where towns like Springdale, Utah with its population of 400 must provide services sufficient to move 2.6 million visitors annually to Zion National Park.

Recreational communities throughout the nation, regardless of the presence of a national park, struggle with the discrepancy between local populations and local transit needs.

This research should compare funding available to parks versus other agencies providing transit. The comparison should identify monetary allocations, transit ridership, and potential transit ridership left latent due to insufficient service capacity. The findings should culminate in policy recommendations for the structure of how transportation funding agencies define need.

5.5.2.2. Examination of Budget Structures

Budget structures of public land agencies shape the way they spend money. With new initiatives for transit in national parks, the National Park Service has a budget structured toward capital funding for assets and infrastructure (buses, bus stops, fueling stations, and so forth) and less of an emphasis on money for operations. As a result, several parks instituted transit service with buses and infrastructure on the ground, but no planned revenue stream to sustain operations. With the fee demonstration program from National Parks Pass revenue, money that formerly went into park operational coffers through entrance fees now must only go to projects of fixed duration because the demonstration project might not extend in perpetuity.

This research should examine budgets at all levels of public land agencies, including Congressional appropriations, allocation procedures in the national offices, regional funding distributions, and individual land units. The study would likely entail surveys of parks and targeted interviews at select parks on the concept of budget structure. Survey questions about transportation budgets should cover funding sources, budgeting, priorities, and needs.

The study should also look at the practices that have sustained transit in some public land units. What emergency reserves have helped overcome funding shortfalls? How did Zion and Bryce Canyon National Parks stay (somewhat) afloat through the lean years? Were these emergency measures appropriate? What programs suffered as a result of the re-allocation of funds to transit? What repercussions came out of those program cuts?

Notably, national parks cannot say how much money they spend on transportation. Budget structures consider roads as facilities, while allocating transportation services to other budget categories. While transportation ranks as the biggest budget category in many government agencies, the National Park Service cannot say how much money it spends on transportation at either the park or national levels. With an accurate accounting of transportation budget needs, public land agencies can approach Congress with data on needs, the comparative allocations that go to other government agencies, and a rationale for funding requests. Individual land management units will find the results of this research useful in streamlining accounting.

5.5.2.3. The Financial Impact of the National Parks Pass on Parks with Transit

The National Park Service has no real understanding of the impact of the National Parks Pass on the park system and park system finances. Park Service management has little information on the effect on transit initiatives in individual parks resulting from reductions in local transportation fee collection when local fees defer to the centralized coffer of the national pass. A study on the effects of the Golden Eagle Pass provided the basis of analysis that led to approval for the 2000 launch of the National Parks Pass program (*110*). In 2003, the National Park Service contracted a study on general effects of the National Parks Pass program.

Future research needs to target the impacts of the National Parks Pass on parks with transit. With the introduction of the National Parks Pass, Bryce Canyon National Park's fee collection dropped from 80 percent of visitors paying fees to 36 percent. The funding scheme for the Bryce Canyon's shuttle system fell apart that same year because transit system organizers had anticipated that every group of people visiting the park would pay a transportation fee.

Most likely, visitors use the National Parks Pass most when they drive a circuit of multiple parks during their vacations. Research into this phenomenon should employ geographic information systems (GIS) to investigate a traveling salesman problem along a highway network. Given a cluster of parks in an area, in what order will tourists visit the parks? Where will they most likely buy a multi-park pass? A survey of parks along defined traveling salesman routes and of control parks not on the routes will provide data on revenue collection before and after the introduction of the National Parks Pass. Correlating changes in fee collection with the location of parks in relation to the traveling salesman problem should provide information about how the multi-park pass has affected fee collection in parks that have assumed financial responsibility for transit service.

The results of this study will help the National Park Service and other public land agencies affected by national passes to understand which parks have lost local fee collection and which parks have gained most from allocations of pass program revenue. Policy makers can then make more informed decisions on how to distribute funding earned in pass programs equitably among federal land units.

5.5.3. Transportation Project Planning for Public Lands

5.5.3.1. Examination of Project Planning Procedures

The General Accounting Office raised concerns in 2002 about the administration of the National Park Service's Alternative Transportation Program. In a letter to the chair of the House of Representatives Subcommittee on Interior and Related Agencies, the General Accounting Office raised questions about how to plan for future shuttle system starts and expansions. The letter identified that "the Park Service's process for ensuring that transportation projects are needed and cost effective could be strengthened." Consideration of "broad agency-wide objectives" has superseded comparison of transportation alternatives on the basis of operating and maintenance costs (*111*). Such costs impact all stakeholders who contribute funds to sustain transportation alternatives.

Research into transportation project planning should directly address the issues raised in the General Accounting Office's letter. Case study analysis of the alternative transportation planning procedures used to date will show how transit system organizers have selected alternatives in the past and how the selection process can improve for future planning. Beyond investigation into project planning across federal public land agencies, this research should include the planning work of strong state public land agencies for potential models.

Environmental review documents from across the country and interviews with participants in planning processes can provide the foundation for comparative analysis of project planning procedures. The analysis should consider the types of alternatives considered and, if possible, cite the origin of the ideas. At what point have different stakeholders come into the planning process? To what extent have they been involved in

the selection of the short list of alternatives strongly considered and the ultimate solution pursued? At what point are costs discussed? How have ongoing expenses entered into decision-making, and how should they? Ultimate findings of the research should identify if review documents consider low-cost alternatives to ease the financial burden on public land agencies and other stakeholders.

This research should further investigate whether and how it would be possible to establish a methodology for rating transportation alternatives for similarity or difference to each other. For instance, a park considering diesel buses, propane buses, and no buses would not demonstrate the same breadth of consideration as a park considering propane buses, light rail, automated monorail, new parking strategies, or no action. The rating system should consider which alternatives have been proposed and dismissed versus which have been developed with full cost models. The rating system might also rate the short list of alternatives for viability to ensure that more than one viable alternative is seriously considered.

5.5.3.2. Guidance for Visitor Use Surveys

The National Park Service should create guidance for visitor use survey questions to capture transportation issues and concerns. Visitor use surveys typically come out of the efforts of individual parks contracting studies; however, continuity of data quality, comparability from park to park, and trend analysis within one park over time require consistency in types of questions, question wording, and response options. For analytically defensible scientific understanding of transportation issues at parks with transit, similar parks without transit need to provide identical survey data to compare the results of a control group; therefore, guidance for visitor use surveys should include

recommendations for questions to appear on the national visitor survey card administered annually throughout the national park system (*112*).

5.5.3.3. The Impact of Infrastructure Policies on the Costs of Transit Systems.

Most public lands have transportation infrastructure (roads, transit facilities, airstrips, and so forth) with substantial need for maintenance and planning. Beyond typical civic needs for infrastructure, the National Park Service must hold itself to a high standard for aesthetic quality and environmental responsibility in its unique environments of fragile natural resources and historic landmarks. This standard often leads to higher infrastructure construction, maintenance, and repair costs.

In planning and practice, the National Park Service is incorporating sustainable transportation and the infrastructure necessary to support sustainable transportation; however, that infrastructure must be sustained, as well. With new shuttle systems, national parks assume capital and maintenance costs for bus stops, fueling stations, operations centers, intelligent transportation systems (ITS) equipment, accelerated road deterioration under the weight of the heavy vehicles, and so forth. In many cases, parks implementing transit consider the initial capital costs, but they do not forecast annual costs for maintenance.

What impact does transit have on immediate and ongoing infrastructure funding requirements? This analysis should include quantitative comparisons of net present or annual costs of case study transit systems under current policies and under hypothetical policies. Perhaps superimposing the policies of one park upon another could help develop best practice recommendations from proven methods.

Does the National Park Service determine whether to build infrastructure according to capital funding availability or according to need and benefit-cost analysis? For infrastructure, project planners should conduct benefit-cost analysis including annual investment to understand the right level of funding to dedicate to immediate infrastructure purchase and ongoing maintenance. As part of planning for new transportation systems, parks need to establish a viable strategy for monitoring and maintaining new types of infrastructure. Ongoing maintenance for all construction and rehabilitation projects should appear as a mandatory component of environmental review of proposed public land projects.

The financial responsibilities assumed for transit system infrastructure affect all stakeholders contributing funding. As costs rise, so does the need for higher contributions or more contributors. Sometimes the distribution of costs has clear delineations. For instance, federal money builds and maintains bus stops on park lands, while local or state money covers bus stops outside parks. In other cases, the impact on individual stakeholders remains unclear… rising total costs affect all stakeholders trying to find sufficient funding. To the extent possible, this analysis should delineate costs affecting the National Park Service versus costs absorbed by local communities, state departments of transportation, and other funding groups.

5.5.3.4. Transportation's Role in Park Capacity Analysis and Planning

As the National Park Service develops standards and guidelines for establishing park capacities in the Visitor Experience and Resource Protection framework (*103*), transportation needs to enter into the discussion. Many of stakeholders involved in planning transit for parks report that in effect, transit increases the capacity of parks and

gateway communities because shuttles allow people to access destinations without the constraint of a fixed capacity of parking for private vehicles. If infrastructure capacity for private vehicles has historically defined park capacity, then the National Park Service should investigate establishing a knowledge-base and guidelines for ways to consider the link between transportation capacity and visitation constraint, the new-found ways to expand transportation capacity, and the need for protection from damage caused by overuse of natural and cultural resources.

This research should facilitate interaction between capacity planners and transportation professionals working on park projects. Such interdisciplinary communication will help the National Park Service conduct its long-range planning in an informed and coordinated manner for more efficient and effective project implementation in parks.

5.5.4. Context and Further Applicability

5.5.4.1. The History of Transportation for Public Lands

Current National Park Service practices in transportation planning and operations have emerged from a century-long legacy of providing for the mobility needs of visitors in parks. For instance, a policy statement by Secretary of the Interior Franklin Lane in 1917 set precedence that park improvements, including the construction of roads, trails, buildings, and other development, must occur "in accordance with a preconceived plan developed with special reference to the preservation of the landscape," and these plans must derive out of a knowledge of "landscape architecture or… proper appreciation of the esthetic value of park lands." From these early days, the esthetic importance of facilities took precedence over other professional considerations (*113*). As a result,

landscape architects handle most transportation projects in the National Park Service even 85 years after that declaration. Introducing people trained in transportation for transit initiatives is requiring a major shift in procedures within the agency.

Investigation into the history of transportation decisions and practices in public land agencies (namely, the National Park Service and the Fish and Wildlife Service in the Department of the Interior, as well as the U.S. Forest Service in the Department of Agriculture) will result in a resource for public land agency personnel, transportation agencies, and consultants participating in public land transportation projects. This resource will help professionals in all agencies efficiently get up to speed on issues and practices, and it will allow policy-makers within the agencies to critique and streamline their established structures.

The final document should tell the story of the evolution of transportation policy and practice in federal land agencies. The report should depict the current operational and policy environment in each agency, identify best practices across the different agencies or in general transportation agencies, and indicate recommendations for potential changes in policies and practices based on the findings. Fact-finding for this research should rely heavily on literature reviews and interviews with people inside the agencies. Analysis of the findings should incorporate modern theory on organizational behavior.

5.5.4.2. Expanded Applicability of Public Land Transportation Practices

While the National Park Service and other public land agencies struggle to accommodate modern transportation demands for recreational areas, other agencies, organizations, and businesses are taking note. Public land agencies know that they need to establish transportation alternatives that do more than move people from point to point.

These alternatives must offer so much appeal that visitors will choose to take them on their vacations. The quality of service must ensure that transportation problems will not deter visitors from planning visits to parks and spending money in local businesses. The alternatives must also set the example for environmental responsibility in transportation. The quality of service for recreational transit must achieve a vacation-quality standard with exemplary natural and cultural environmental responsibility.

State and local transportation departments have expressed interest in recent developments in recreational transportation. For instance, the National Park Service has received inquiries about guardrails it developed to blend into the cultural environment of parks while meeting modern traffic safety standards. Federal agencies are developing transportation technologies, such as rural intelligent transportation systems (ITS), to extend modern practice in urban areas into unique contexts that exist in many areas.

While some agencies have noted these innovations, the word has not spread as far as it needs to go. A research report should document the applicability of public lands transportation practices on federal, state, and local transportation agencies. What new practices have been developed? How can these practices adapt to other transportation contexts? At what cost can other agencies implement them? Identifying this applicability will establish a foundation for public land agencies and other interested agencies and groups to fund research on recreational transportation jointly, thereby furthering the state of the practice.

5.5.5. Research Priorities

Based on the needs of the National Park Service and the results of this research, some forays into two of these research areas have already begun. The Transit Cooperative

Research Program is considering project statements for 5.5.1.1 Econometric Modeling of Transit's Impacts on Visitor Spending and 5.5.1.4 Investigation into Transportation's Impact on Visitor Experience. The National Park Service gives a top priority to these areas of investigation as means of furthering public transit initiatives in parks.

The results of this research project lend themselves to giving priority to a few other key areas of inquiry, as well:

- Because so few stakeholders demonstrated knowledge of the critical importance of frequency and reliability to attract transit ridership, 5.5.1.5 Ridership Sensitivity to Frequency of Park Transit Service deserves immediate and close scrutiny.
- With each individual park struggling to find its own ways to fund transit service and with the inherent imbalance between capital and operating budgets, 5.5.2.2 Examination of Budget Structures could make the difference between failure and survival for many park transit systems, including some of the successful case studies identified here, such as the Bryce Canyon Shuttle and the Yosemite Area Regional Transit System (YARTS).
- Given the financial troubles of transit systems dependent on transportation fees in parks that claim to have received substantial negative impacts from the National Parks Pass, 5.5.2.3 The Financial Impact of the National Parks Pass on Parks with Transit merits priority. Without any firm data on the subject, the National Park Service and other public land agencies cannot allocate revenue equitably and fairly.

- The topic 5.5.3.4 Transportation's Role in Park Capacity Analysis and Planning derives directly out of ongoing endeavors in the National Park Service to determine the carrying capacity of parks when parking ceases to constrain demand. This research project makes a logical progression where the momentum of interest and attention already exists.
- Finally, 5.5.4.2 Expanded Applicability of Public Land Transportation Practices will likely fall away from the attention of decision makers for research on transportation and national parks, yet it could create long-range benefit unparalleled by other investigations. Making the link between public land recreational travel standards and the improvement of transportation standards in more established markets and systems can stimulate interest in transportation on public lands from. This new interest could attract more transportation professionals to turn their attention to public lands, and large traditional transit authorities might find reason to collaborate on projects beneficial to public land agencies. Simultaneously, transportation in traditional settings can improve more rapidly than if the unestablished link of expanded applicability leaves public land transportation to advance on its own in isolation.

These priority projects can originate from different places. Some of these research projects, such as the Expanded Applicability of Public Land Transportation Practices might find sponsors through cooperative research programs. Other agency-specific topics might need to emerge from within the National Park Service, from Congress, or

through an interest group or groups dedicated to the protection and most proper operation of national parks.

5.6. Summary

Before asking the question of the impacts of transit in parks, analysts should consider the goals of the systems. Impacts either represent progress (or lack thereof) toward goals or externalities assumed in the pursuit of those goals. Resource allocations and system design must follow from goals, and this context defines how to interpret the data obtained from performance monitoring of impacts. Performance monitoring systems should emerge from a delineated procedure:

1. Identify partners and stakeholders; design a public involvement strategy
2. Define and address goals and objectives according to stakeholder interest
3. Select performance measures and develop consensus
4. Design the transit system and communication program
5. Consider available resources
6. Test and implement the performance monitoring program
7. Monitor and report performance
8. Integrate results into transit decision-making
9. Review and update the program

This system will provide structure to the collection and analysis of information on intended impacts and externalities. Performance monitoring should start with a baseline before the initiation of transit changes, and it needs to continue at regular intervals thereafter. Transit system organizers need to program funding in ongoing programs, and multiple stakeholders need to contribute to the review efforts. Beyond the normal data

collection and analysis procedures, stakeholders need to examine long-range examination policies and their impacts. For example, land use, local demography, real estate, and park circulation policies and trends will affect the effectiveness of transit and progress toward goals.

Beyond the issues identified in this research, many issues remain unexplored. Future research should continue to refine understanding of local impacts of transit in parks. Park funding and resource allocation need thorough examination to ensure that resources go to the most important aspects of transit. In general, park and transportation professionals will benefit from information that offers a broader understanding of transportation project planning for public lands and the context and history of public land transportation.

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6.0 CONCLUSION

Understanding the impacts of transit in parks requires a sense of the context and intent for each given transit service. Many parks need transit, but the goals and other inputs of transit planning and decision making vary. Outputs of services and strategies for transit follow from those inputs, and the outcomes of transit depend on how transit is implemented. Factors such as service scope, which derive directly from the goals of the planning process, affect the ultimate impacts. Small systems designed to create marginal impacts on traffic and parking might create nominal impacts on local economies, whereas large-scale systems, as in Zion, could create a shift in the local economic structure. Given that transit in parks forms one component of a regional recreational system, the performance of transit impacts a number of stakeholders who should work together toward common aims. Impacts (whether related to the local economy, traffic, air quality, or other aspects of the social, cultural, or ecological environment) should be monitored against the goals set by partners.

Many factors contribute to the type and scale of impacts felt in parks and gateway communities. Route structure, partnering, communication, transit presence, and intelligent transportation systems all affect the effectiveness of transit systems and their abilities to attract passengers. Many discussions of the impacts of transit do not address these contributing inputs, but transit system organizers must understand the inputs that lead to desired or undesired outcomes in order to achieve the objectives of transit efficiently and as cost-effectively as possible. After transit system organizers have

identified the goals of transit service to identify desired impacts, performance monitoring will show progress toward the goals and the impacts of externalities. Performance monitoring requires data collection, analysis, and review to inform future policy actions.

This report presents the most comprehensive findings available on the subject of the impacts of transit in parks. This research has contributed:

- An examination of past economic impact studies and an identification of the reasons why traditional economic impact methodologies fail to capture the economic impacts of transit in parks on gateway communities.
- A methodology for characterizing gateway community economies and how transit will affect them with sensitivity to distance from transit stops
- A conceptual model for considering how to approach analyzing various types of outcomes from transit in relation to inputs contributing to transit systems
- Evaluation of the impacts of transit in existing situations, analysis of contributing factors, and recommendations for mitigating negative impacts and enhancing positive outcomes
- Identification of critical factors affecting how transit impacts national parks and gateway communities
- Guidelines for monitoring the performance of transit according to the goals established for individual systems, including economic effects on local economies
- Recommendations for best practices according to the contexts where they fit
- Directions for future research to refine understanding of the impacts of transit and to improve service efficiency, quality, and visitor experience

The case studies conducted in this research helped identify issues facing local economies when transit is introduced in national parks; this project also resulted in questions for future evaluation and research. Many of those questions regard site-specific impacts affected by characteristics of the local community and the design of transit systems. The guidance and recommendations put forth in this research will help park and gateway community transit planners to take a proactive approach to providing access to destinations of recreational and commercial interest to tourists, as well as to meeting local economic needs. The performance monitoring plan will help parks and recreational communities plan for and monitor the impacts they desire as outcomes to make progress toward achieving specified goals.

Transit for recreational areas differs from standard transit practice in several important ways:

- Peak demand occurs at unusual times, such as around meal times and sunset, rather than at the start and end of the business day. Recreational destinations near urban areas might have heaviest visitation on weekends, whereas remote destination parks might have consistent traffic on weekends and weekdays.
- Although the transit systems might be located in rural areas, recreational visitors typically come from metropolitan areas, giving riders an urban sensitivity to time and transit frequency.
- Transit operators need to provide vacation-quality service; otherwise, people will not take transit on their vacations. If transit service quality fails to meet high standards, gateway communities fear that tourists will choose other destinations for their vacations.

- Unless year-round visitation merits continuous service, transit operations must contend with the characteristics of a seasonal workforce.
- Unfamiliar drivers and a low percentage of the population familiar with locations of stops and time needed to reach them. This lack of familiarity makes communication and training of front-line employees throughout recreational areas vitally important.
- Financiers for recreational transit must overcome the dichotomy between the American standard for allocating funding according to residential population and the sometimes overwhelmingly larger population of the visiting public that uses the transit
- Although primary ridership targeting requires a focus on visitor mobility, recreation transit must also accommodate the commuting needs of the local workforce in order to make workers' parking spaces available for visitors
- Many recreational areas center on the beauty of difficult terrain and climates, which can require special transit vehicle characteristics and driving skills.

In addition to these characteristics of recreational transit, transit planning for national parks and gateway communities must demonstrate a heightened sensitivity to the environment to fulfill the National Park Services role as environmental steward. Transit planning in the areas around national parks must also accommodate the requirements and needs of multiple jurisdictions as buses move between local streets, state highways, and federal lands.

With the unique characteristics of recreational transit in and around national parks, the potential positive and negative consequences of service initiatives such as transit can

affect many people in different ways. Transit system organizers for national parks and gateway communities need to take a planning approach to prepare for the impacts of transit and to create the most desirable effect for a given local environment. Rather than focusing on economic, environmental, financial, or any other specific type of impact, transit systems must be considered through a systems approach that anticipates externalities and tradeoffs between goals. This systems approach will prepare stakeholders to understand the tradeoffs necessary to achieve the most balanced outcome according to established goals.

Primarily, rather than asking what impacts transit can be expected to generate, transit system organizers should articulate the types of impacts they intend to create. These objectives formed in local context need to balance across the interests of different stakeholders and the tradeoffs inherent in pursuing any given objective. After adopting system goals and planning operations, performance monitoring of inputs, outputs, and outcomes will give critical information on progress toward goals, the associated costs, and the external effects generated. Transit planning, management, and operations can use this information to work more efficiently and achieve progress toward desired context-sensitive outcomes of transit.

APPENDIX A: SECTORS DERIVED FROM NAICS AND SIC CODES

This table comes largely from a table created by the U.S. Census Bureau (http://www.census.gov/epcd/ec97brdg/) for bridging between the 1987 Standard Industrial Classification (SIC) system and the 1997 North American Industry Classification System (NAICS). The far right column added here indicates the tourism classification categories used to characterize gateway community economies in this research. Industries not listed in this table are considered unrelated to tourism in this coding scheme and fall into the class, "Other."

SIC	NAICS Description	NAICS	Class
2741			Retail
2741	Periodical Publishers (pt)	51112	Retail
2741	Book Publishers (pt)	51113	Retail
2741	Music Publishers (pt)	51223	Retail
2741	All Other Publishers	511199	Retail
41			Service
4111			Service
4111	Mixed Mode Transit Systems	485111	Service
4111	Commuter Rail Systems	485112	Service
4111	Bus and Other Motor Vehicle Transit Systems	485113	Service
4111	Other Urban Transit Systems	485119	Service
4111	All Other Transit and Ground Passenger Transportation (pt)	485999	Service
4119			Service
4119	Ambulance Service (pt)	62191	Service
4119	School and Employee Bus Transportation (pt)	48541	Service
4119	Scenic and Sightseeing Transportation, Land (pt)	48711	Service
4119	Special Needs Transportation	485991	Service
4119	All Other Transit and Ground Passenger Transportation (pt)	485999	Service
4119	Limousine Service	48532	Service
4121	Taxi Service (pt)	48531	Service
4131	Interurban and Rural Bus Transportation	48521	Service
4141	Charter Bus Industry (pt)	48551	Service
4142	Charter Bus Industry (pt)	48551	Service
42			Service
4212	Specialized Freight (except Used Goods) Trucking, Local (pt)	48422	Service

SIC	NAICS Description	NAICS	Class
4215			Service
4215	Couriers (pt)	49211	Service
4215	Local Messengers and Local Delivery	49221	Service
43			Service
4311	Postal Service (pt)	49111	Service
44			Service
4481			Service
4481	Deep Sea Passenger Transportation	483112	Service
4481	Coastal and Great Lakes Passenger Transportation (pt)	483114	Service
4482			Service
4482	Coastal and Great Lakes Passenger Transportation (pt)	483114	Service
4482	Inland Water Passenger Transportation (pt)	483212	Service
4489			Service
4489	Inland Water Passenger Transportation (pt)	483212	Service
4489	Scenic and Sightseeing Transportation, Water (pt)	48721	Service
4492	Navigational Services to Shipping (pt)	48833	Service
4493	Marinas	71393	Service
4499			Service
4499	Commercial Air, Rail, and Water Transportation Equipment Rental and Leasing (pt)	532411	Service
4499	Navigational Services to Shipping (pt)	48833	Service
4499	Other Support Activities for Water Transportation (pt)	48839	Service
45			Service
4512			Service
4512	Scheduled Passenger Air Transportation	481111	Service
4512	Scheduled Freight Air Transportation	481112	Service
4513	Couriers (pt)	49211	Service
4522			Service
4522	Ambulance Services (pt)	62191	Service
4522	Nonscheduled Chartered Freight Air Transportation	481212	Service
4522	Nonscheduled Chartered Passenger Air Transportation	481211	Service
4522	Scenic and Sightseeing Transportation, Other (pt)	48799	Service
4581			Service
4581	Air Traffic Control (pt)	488111	Service
4581	Other Airport Operations (pt)	488119	Service
4581	Janitorial Services (pt)	56172	Service
4581	Other Support Activities for Air Transportation	48819	Service
47			Service
4724	Travel Agencies	56151	Service
4725	Tour Operators	56152	Service
4729			Service
4729	All Other Support Activities for Transportation (pt)	488999	Service
4729	All Other Travel Arrangement and Reservation Services (pt)	561599	Service
4731			Service
4731	Process, Physical Distribution, and Logistics Consulting	541614	Service

SIC	NAICS Description	NAICS	Class
	Services (pt)		
4731	Freight Transportation Arrangement	48851	Service
48			Service
4812			Service
4812	Paging	513321	Service
4812	Cellular and Other Wireless Telecommunications (pt)	513322	Service
4812	Telecommunications Resellers (pt)	51333	Service
4813			Service
4813	Wired Telecommunications Carriers (pt)	51331	Service
4813	Telecommunications Resellers (pt)	51333	Service
4813	Satellite Telecommunications (pt)	51334	Service
4822	Wired Telecommunications Carriers (pt)	51331	Service
4899			Service
4899	Taxi Service (pt)	48531	Service
4899	Cellular and Other Wireless Telecommunications (pt)	513322	Service
4899	Satellite Telecommunications (pt)	51334	Service
4899	Other Telecommunications	51339	Service
5271	Manufactured (Mobile) Home Dealers	45393	Retail
53			Retail
5311	Department Stores	45211	Retail
5331	All Other General Merchandise Stores (pt)	45299	Retail
5399			Retail
5399	Warehouse Clubs and Superstores (pt)	45291	Retail
5399	All Other General Merchandise Stores (pt)	45299	Retail
54			Food
5411			Food
5411	Gasoline Stations with Convenience Stores (pt)	44711	Food
5411	Supermarkets and Other Grocery (except Convenience) Stores	44511	Food
5411	Warehouse Clubs and Superstores (pt)	45291	Food
5411	Convenience Stores	44512	Food
5421			Food
5421	Other Direct Selling Establishments (pt)	45439	Food
5421	Meat Markets (pt)	44521	Food
5421	Fish and Seafood Markets	44522	Food
5431	Fruit and Vegetable Markets	44523	Food
5441			Food
5441	Confectionery and Nut Stores	445292	Food
5441	Confectionery Manufacturing from Purchased Chocolate (pt)	31133	Food
5441	Nonchocolate Confectionery Manufacturing (pt)	31134	Food
5451	All Other Specialty Food Stores (pt)	445299	Food
5461			Food
5461	Snack and Nonalcoholic Beverage Bars (pt)	722213	Food
5461	Retail Bakeries	311811	Food
5461	Baked Goods Stores	445291	Food

SIC	NAICS Description	NAICS	Class
5499			Food
5499	Meat Markets (pt)	44521	Food
5499	Food (Health) Supplement Stores	446191	Food
5499	All Other Specialty Food Stores (pt)	445299	Food
55			Retail
5511	New Car Dealers	44111	Retail
5521	Used Car Dealers	44112	Retail
5531			Retail
5531	Tire Dealers (pt)	44132	Retail
5531	Automotive Parts and Accessories Stores (pt)	44131	Retail
5531	All Other General Merchandise (pt)	45299	Retail
5541			Retail
5541	Gasoline Stations with Convenience Store (pt)	44711	Retail
5541	Other Gasoline Stations	44719	Retail
5551	Boat Dealers	441222	Retail
5561	Recreational Vehicle Dealers	44121	Retail
5571	Motorcycle Dealers	441221	Retail
5599	All Other Motor Vehicle Dealers	441229	Retail
56			Retail
5611			Retail
5611	Men's Clothing Stores	44811	Retail
5611	Clothing Accessories Stores (pt)	44815	Retail
5621	Women's Clothing Stores	44812	Retail
5632			Retail
5632	Other Clothing Stores (pt)	44819	Retail
5632	Clothing Accessories Stores (pt)	44815	Retail
5641	Children's and Infants' Clothing Stores	44813	Retail
5651	Family Clothing Stores	44814	Retail
5661	Shoe Stores	44821	Retail
5699			Retail
5699	Included in Apparel Manufacturing Subsector Based on Type of Garment Produced	315	Retail
5699	Other Clothing Stores (pt)	44819	Retail
5699	Clothing Accessories Stores (pt)	44815	Retail
57			Retail
5712			Retail
5712	Nonupholstered Wood Household Furniture Manufacturing (pt)	337122	Retail
5712	Wood Kitchen Cabinet and Countertop Manufacturing (pt)	33711	Retail
5712	Upholstered Household Furniture Manufacturing (pt)	337121	Retail
5712	Furniture Stores (pt)	44211	Retail
5713	Floor Covering Stores (pt)	44221	Retail
5714			Retail
5714	Window Treatment Stores (pt)	442291	Retail
5714	Sewing, Needlework, and Piece Goods Stores (pt)	45113	Retail

SIC	NAICS Description	NAICS	Class
5714	Curtain and Drapery Mills (pt)	314121	Retail
5714	Other Household Textile Product Mills (pt)	314129	Retail
5719			Retail
5719	Window Treatment Stores (pt)	442291	Retail
5719	Included in Manufacturing sector based on article produced		Retail
5719	All Other Home Furnishings Stores (pt)	442299	Retail
5722	Household Appliance Stores	443111	Retail
5731			Retail
5731	Radio, Television, and Other Electronics Stores (pt)	443112	Retail
5731	Automotive Parts and Accessories Stores (pt)	44131	Retail
5734	Computer and Software Stores (pt)	44312	Retail
5735	Prerecorded Tape, Compact Disc, and Record Stores	45122	Retail
5736	Musical Instrument and Supplies Stores	45114	Retail
58			Food
5812			Food
5812	Full-Service Restaurants	72211	Food
5812	Limited-Service Restaurants	722211	Food
5812	Cafeterias	722212	Food
5812	Snack and Nonalcoholic Beverage Bars (pt)	722213	Food
5812	Food Service Contractors	72231	Food
5812	Caterers	72232	Food
5812	Theater Companies and Dinner Theaters (pt)	71111	Food
5813	Drinking Places (Alcoholic Beverages)	72241	Food
59			Retail
5912	Pharmacies and Drug Stores	44611	Retail
5921	Beer, Wine, and Liquor Stores	44531	Retail
5932			Retail
5932	All Other Nondepository Credit Intermediation	522298	Retail
5932	Used Merchandise Stores	45331	Retail
5941	Sporting Goods Stores	45111	Retail
5942	Book Stores	451211	Retail
5943	Office Supplies and Stationery Stores (pt)	45321	Retail
5944	Jewelry Stores	44831	Retail
5945	Hobby, Toy, and Game Stores	45112	Retail
5946	Camera and Photographic Supplies Stores	44313	Retail
5947	Gift, Novelty, and Souvenir Stores	45322	Retail
5948	Luggage and Leather Goods Stores	44832	Retail
5949	Sewing, Needlework, and Piece Goods Stores (pt)	45113	Retail
5961	Electronic Shopping and Mail-Order Houses	45411	Retail
5962	Vending Machine Operators	45421	Retail
5963			Retail
5963	Mobile Food Services	72233	Retail
5963	Other Direct Selling Establishments (pt)	45439	Retail
5983	Heating Oil Dealers (pt)	454311	Retail
5984	Liquefied Petroleum Gas (Bottled Gas) Dealers (pt)	454312	Retail

SIC	NAICS Description	NAICS	Class
5989	Other Fuel Dealers	454319	Retail
5992	Florists	45311	Retail
5993	Tobacco Stores	453991	Retail
5994	News Dealers and Newsstands	451212	Retail
5995			Retail
5995	Ophthalmic Goods Manufacturing (pt)	339115	Retail
5995	Optical Goods Stores	44613	Retail
5999			Retail
5999	Cosmetics, Beauty Supplies, and Perfume Stores (pt)	44612	Retail
5999	All Other Health and Personal Care Stores (pt)	446199	Retail
5999	Pet and Pet Supplies Stores	45391	Retail
5999	Art Dealers	45392	Retail
5999	Radio, Television, and Other Electronics Stores (pt)	443112	Retail
5999	All Other Miscellaneous Store Retailers (except Tobacco Stores) (pt)	453998	Retail
6021			Service
6021	Commercial Banking (pt)	52211	Service
6021	Credit Card Issuing (pt)	52221	Service
6022			Service
6022	Commercial Banking (pt)	52211	Service
6022	Credit Card Issuing (pt)	52221	Service
6022	Other Depository Credit Intermediation	52219	Service
70			Lodging
7011			Lodging
7011	Hotels (except Casino Hotels) and Motels (pt)	72111	Lodging
7011	Casino Hotels	72112	Lodging
7011	Bed-and-Breakfast Inns	721191	Lodging
7011	All Other Traveler Accommodation	721199	Lodging
7021	Rooming and Boarding Houses (pt)	72131	Lodging
7032	Recreational and Vacation Camps (except Campgrounds)	721214	Lodging
7033	RV (Recreational Vehicle) Parks and Campgrounds	721211	Lodging
7041			Lodging
7041	Hotels (except Casino Hotels) and Motels (pt)	72111	Lodging
7041	Rooming and Boarding Houses (pt)	72131	Lodging
72			Service
7211	Drycleaning and Laundry Services (except Coin-Operated) (pt)	81232	Service
7212	Drycleaning and Laundry Services (except Coin-Operated) (pt)	81232	Service
7213	Linen Supply (pt)	812331	Service
7215	Coin-Operated Laundries and Drycleaners	81231	Service
7219			Service
7219	Linen Supply (pt)	812331	Service
7219	Other Personal and Household Goods Repair and Maintenance (pt)	81149	Service

SIC	NAICS Description	NAICS	Class
7219	Drycleaning and Laundry Services (except Coin-Operated)	81232	Service
7221	Photography Studios, Portrait	541921	Service
7231			Service
7231	Beauty Salons	812112	Service
7231	Nail Salons	812113	Service
7231	Cosmetology and Barber Schools (pt)	611511	Service
7241			Service
7241	Barber Shops	812111	Service
7241	Cosmetology and Barber Schools (pt)	611511	Service
7251			Service
7251	Footwear and Leather Goods Repair (pt)	81143	Service
7251	All Other Personal Services (pt)	81299	Service
7299			Service
7299	Employment Placement Agencies (pt)	56131	Service
7299	Diet and Weight Reducing Centers	812191	Service
7299	Parking Lots and Garages (pt)	81293	Service
7299	Formal Wear and Costume Rental (pt)	53222	Service
7299	Other Personal Care Services	812199	Service
7299	All Other Personal Services (pt)	81299	Service
7384			Service
7384	Photofinishing Laboratories (except One-Hour)	812921	Service
7384	One-Hour Photofinishing	812922	Service
75			Service
7513	Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing (pt)	53212	Service
7514	Passenger Car Rental	532111	Service
7515	Passenger Car Leasing	532112	Service
7519	Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing (pt)	53212	Service
7521	Parking Lots and Garages (pt)	81293	Service
7532	Automotive Body, Paint, and Interior Repair and Maintenance	811121	Service
7533	Automotive Exhaust System Repair	811112	Service
7534			Service
7534	Tire Retreading	326212	Service
7534	All Other Automotive Repair and Maintenance (pt)	811198	Service
7536	Automotive Glass Replacement Shops (pt)	811122	Service
7537	Automotive Transmission Repair	811113	Service
7538	General Automotive Repair	811111	Service
7539	Other Automotive Mechanical and Electrical Repair and Maintenance	811118	Service
7542	Car Washes	811192	Service
7549			Service
7549	Automotive Glass Replacement Shops (pt)	811122	Service
7549	Automotive Oil Change and Lubrication Shops	811191	Service

SIC	NAICS Description	NAICS	Class
7549	Motor Vehicle Towing	48841	Service
7549	All Other Automotive Repair and Maintenance (pt)	811198	Service
76			Service
7631	Other Personal and Household Goods Repair and Maintenance (pt)	81149	Service
7641			Service
7641	Independent Artists, Writers, and Performers (pt)	71151	Service
7641	Reupholstery and Furniture Repair	81142	Service
7812	Motion Picture and Video Production	51211	Service
7832	Motion Picture Theaters (except Drive-Ins)	512131	Service
7833	Drive-In Motion Picture Theaters	512132	Service
7841	Video Tape and Disc Rental	53223	Service
79			Service
7911			Service
7911	All Other Amusement and Recreation Industries (pt)	71399	Service
7911	Fine Arts Schools (pt)	61161	Service
7929			Service
7929	Musical Groups and Artists	71113	Service
7929	Independent Artists, Writers, and Performers (pt)	71151	Service
7929	Other Performing Arts Companies (pt)	71119	Service
7933	Bowling Centers	71395	Service
7941			Service
7941	Sports Teams and Clubs	711211	Service
7941	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures (pt)	71141	Service
7941	Promoters of Performing Arts, Sports, and Similar Events without Facilities (pt)	71132	Service
7941	Promoters of Performing Arts, Sports, and Similar Events with Facilities (pt)	71131	Service
7948			Service
7948	Racetracks	711212	Service
7948	Other Spectator Sports (pt)	711219	Service
7991	Fitness and Recreational Sports Centers (pt)	71394	Service
7992	Golf Courses and Country Clubs (pt)	71391	Service
7993			Service
7993	Amusement Arcades	71312	Service
7993	Other Gambling Industries (pt)	71329	Service
7993	All Other Amusement and Recreation Industries (pt)	71399	Service
7996	Amusement and Theme Parks	71311	Service
7997			Service
7997	Golf Courses and Country Clubs (pt)	71391	Service
7997	Fitness and Recreational Sports Centers (pt)	71394	Service
7997	All Other Amusement and Recreation Industries (pt)	71399	Service
7999			Service
7999	All Other Travel Arrangement and Reservation Services (pt)	561599	Service

SIC	NAICS Description	NAICS	Class
7999	Scenic and Sightseeing Transportation, Other (pt)	48799	Service
7999	Other Performing Arts Companies (pt)	71119	Service
7999	Other Spectator Sports (pt)	711219	Service
7999	Skiing Facilities	71392	Service
7999	Fitness and Recreational Sports Centers (pt)	71394	Service
7999	Casinos (except Casino Hotels)	71321	Service
7999	Other Gambling Industries (pt)	71329	Service
7999	Nature Parks and Other Similar Institutions (pt)	71219	Service
7999	Sports and Recreation Instruction	61162	Service
7999	All Other Miscellaneous Schools and Instruction (pt)	611699	Service
7999	Promoters of Performing Arts, Sports, and Similar Events with Facilities (pt)	71131	Service
7999	Promoters of Performing Arts, Sports, and Similar Events without Facilities (pt)	71132	Service
7999	Recreational Goods Rental	532292	Service
7999	Scenic and Sightseeing Transportation, Land (pt)	48711	Service
7999	Scenic and Sightseeing Transportation, Water (pt)	48721	Service
7999	All Other Amusement and Recreation Industries (pt)	71399	Service
80			Service
8011			Service
8011	Freestanding Ambulatory Surgical and Emergency Centers	621493	Service
8011	HMO Medical Centers	621491	Service
8011	Offices of Physicians, Mental Health Specialists (pt)	621112	Service
8011	Offices of Physicians (except Mental Health Specialists) (pt)	621111	Service
8021	Offices of Dentists	62121	Service
8031			Service
8031	Offices of Physicians (except Mental Health Specialists) (pt)	621111	Service
8031	Offices of Physicians, Mental Health Specialists (pt)	621112	Service
8041	Offices of Chiropractors	62131	Service
8042	Offices of Optometrists	62132	Service
8043	Offices of Podiatrists	621391	Service
8049			Service
8049	Offices of Mental Health Practitioners (except Physicians)	62133	Service
8049	Offices of Physical, Occupational and Speech Therapists, and Audiologists	62134	Service
8049	Offices of All Other Miscellaneous Health Practitioners	621399	Service
8051			Service
8051	Continuing Care Retirement Communities (pt)	623311	Service
8051	Nursing Care Facilities (pt)	62311	Service
8052			Service
8052	Continuing Care Retirement Communities (pt)	623311	Service
8052	Residential Mental Retardation Facilities	62321	Service
8052	Nursing Care Facilities (pt)	62311	Service
8059			Service
8059	Continuing Care Retirement Communities (pt)	623311	Service

SIC	NAICS Description	NAICS	Class
8059	Nursing Care Facilities (pt)	62311	Service
8062	General Medical and Surgical Hospitals (pt)	62211	Service
8063	Psychiatric and Substance Abuse Hospitals (pt)	62221	Service
8069			Service
8069	General Medical and Surgical Hospitals (pt)	62211	Service
8069	Psychiatric and Substance Abuse Hospitals (pt)	62221	Service
8069	Specialty (except Psychiatric and Substance Abuse) Hospitals	62231	Service
8071			Service
8071	Diagnostic Imaging Centers	621512	Service
8071	Medical Laboratories	621511	Service
8072	Dental Laboratories	339116	Service
8082	Home Health Care Services	62161	Service
8092	Kidney Dialysis Centers	621492	Service
8093			Service
8093	Family Planning Centers (pt)	62141	Service
8093	Outpatient Mental Health and Substance Abuse Centers	62142	Service
8093	All Other Outpatient Care Centers	621498	Service
8099			Service
8099	Blood and Organ Banks	621991	Service
8099	Graphic Design Services (pt)	54143	Service
8099	Commercial Photography (pt)	541922	Service
8099	Family Planning Centers (pt)	62141	Service
8099	All Other Miscellaneous Ambulatory Health Care Services	621999	Service
84			Service
8412			Service
8412	Museums	71211	Service
8412	Historical Sites	71212	Service
8422			Service
8422	Zoos and Botanical Gardens	71213	Service
8422	Nature Parks and Other Similar Institutions (pt)	71219	Service
8661	Religious Organizations	81311	Service
92			Service
9211	Courts	92211	Service
9221	Police Protection	92212	Service
9222	Legal Counsel and Prosecution	92213	Service
9224	Fire Protection	92216	Service
9229	Other Justice, Public Order, and Safety	92219	Service

APPENDIX B: CASE STUDY OF ACADIA NATIONAL PARK AND BAR HARBOR, MAINE



Figure B-1: Acadia National Park.

B.1 Introduction

Acadia National Park implemented transit service to reduce the perception of crowding in the park, to help mitigate an air pollution problem, and to improve safety in parking areas. Acadia coordinated with surrounding gateway communities to create service in the communities, as well as in the park. The Island Explorer Shuttle provides service from hotels and campgrounds to downtown Bar Harbor, Maine, where passengers connect to any of five routes running through the park across Mount Desert Island and an eighth route on nearby Schoodic Peninsula. Shuttle buses share the roads with private vehicles. Although cruise ship passengers arrive in Bar Harbor on port-to-port vacations, Acadia generally acts more like a destination park than a pass-through park: people do not stop there en route to another destination. They spend their vacations there.

Information for this cases study on Acadia National Park comes from a site visit conducted October 24th through 29th, 2002.

B.2 Background

B.2.1 Acadia National Park

Acadia National Park in the middle of coastal Maine spans 47,633 acres (193 km^2) on islands and peninsulas. The park spreads across several islands and intermixes with several communities (Figure B-2). The largest part of the park sits on Mount Desert Island. The landscape includes granite-domed mountains, woodlands, lakes, ponds, and ocean shoreline. The park contains the tallest mountain on the Eastern seaboard, Cadillac Mountain, standing at 1,532 feet (467 m). Throughout the park, carriage roads with stone-faced bridges built and donated by John D. Rockefeller, Jr. give opportunities for bicycling, hiking, and horseback riding on improved paths free of private vehicle traffic.

Acadia has a long and prominent history in the National Park Service. From donated private land, the National Park Service designated the Sieur de Monts National Monument in 1916. In 1919, the designation changed from a national monument to Lafayette National Park, the first national park east of the Mississippi River. Expanded and renamed in 1929, Acadia National Park falls in the Northeast Region of the National Park Service and stands as a destination park unique in the surrounding area as a major rural national park. Other National Park Service units in the region generally preserve historic sites, and the U.S. Forest Service maintains no land in Maine. The State of Maine does have several large state parks reserved for natural open space.

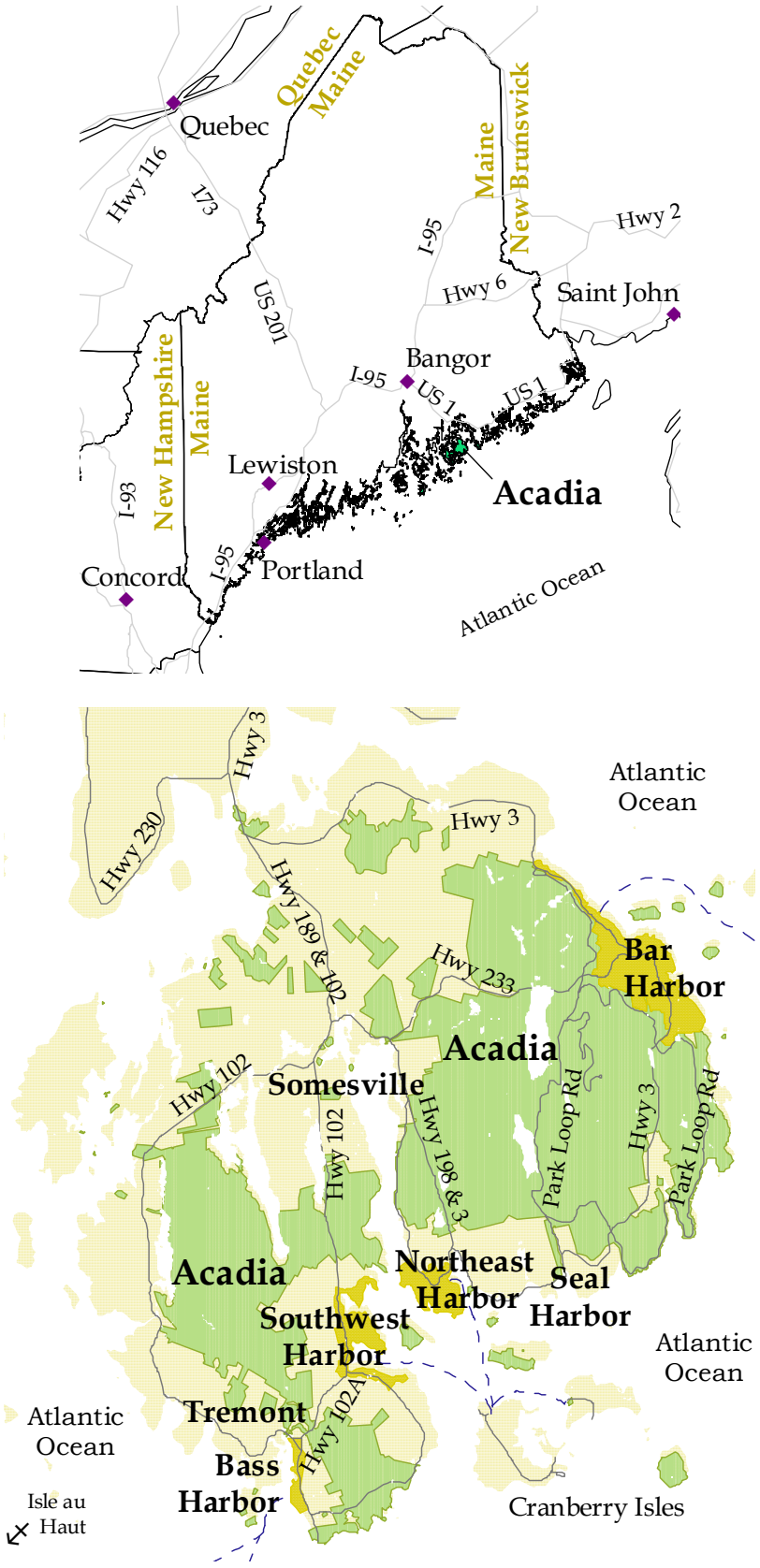


Figure B-2: Acadia in the state of Maine and on Mount Desert Island.

Table B-1: Distance from Acadia to Metropolitan Populations (U.S. Census 2000 and Canadian 2001 Census)

City	*Population*	*Distance*	*City*	*Population*	*Distance*
Bangor, ME	90,864	46 mi (74 km)	Boston, MA	5,819,100	280 mi (451 km)
Portland, ME	243,537	175 mi (282 km)	Montreal, QC	3,426,350	354 mi (570 km)
St. John, NB	122,678	200 mi (322 km)	New York City	21,199,865	489 mi (787 km)
Québec, QC	682,757	266 mi (428 km)	Philadelphia, PA	6,188,463	585 mi (941 km)

Visitors go to Acadia by land, air, or sea. State Highway 3 runs north from Mount Desert Island across a bridge frequently congested with traffic in peak season. State Highway 3 connects to U.S. Route 1 (running east to west at that point) or to U.S. Route 1A, which leads north to Bangor, Maine and Interstate 95. Several metropolitan areas lie within a day's drive of the park (Table B-1). With daily service to Nova Scotia and routes to surrounding islands, ferries offer another form of surface transportation. The Bar Harbor – Hancock County Airport (BHB) sits in Trenton, Maine, about 12 miles (19 km) north of downtown Bar Harbor. It offers scheduled commercial service on small aircraft, as well as charter service and general aviation access. Bangor International Airport (BGR) in Bangor, Maine, located 46 miles (74 km) north of Bar Harbor, offers access through several major commercial carriers. Intercity buses link Bangor and Bar Harbor. Bar Harbor serves as an international cruise ship destination with 63 landings scheduled between Memorial Day and the end of October in 2002, providing the potential of bringing nearly 120,000 passengers and crew to shore for varying lengths of stay (Table B-2).

Table B-2: Scheduled Cruise Ship Landing for Bar Harbor, Maine in 2002 (*114*)

Ship	Line	Pass.	Crew	Landings in 2002	Potential People
Aurora	P&O Lines Chase	1,900	700	1	2,600
American Eagle	American Cruise Lines	49	18	6	402
Brilliance of the Seas	Royal Caribbean	2,500	-	4	10,000
Galaxy	Celebrity	1,896	900	2	5,592
Golden Princess	Princess Cruises	2,600	1,060	6	21,960
Grand Caribe	American Canadian Caribbean	100	17	1	117
Legend	Carnival Cruise Line	2,400	920	1	3,320
Nantucket Clipper	Clipper	102	32	2	268
Niagara Prince	American Canadian Caribbean	84	20	2	208
Norwegian Dream	Norwegian Cruise Lines	2,100	700	3	8,400
Norwegian Sea	Norwegian Cruise Lines	1,800	616	12	28,992
Queen Elizabeth 2	Cunard Line Ltd.	1,800	1,004	1	2,804
Regal Empress	Regal	893	345	3	3,714
Rotterdam	Holland America	1,600	-	14	22,400
Royal Princess	Princess Lines	1,200	500	4	6,800
Silver Shadow	Silversea	382	305	1	687
The World	Residensea	320	343	1	663
Total					**118,927**

Acadia welcomed 2.5 million visitors in 2001, which increased to 2.8 million in 2002. The last visitor use survey at Acadia before the shuttle service expansion occurred August 2nd-8th, 1998. The study showed that 71 percent of visitors came with family members, and 76 percent of visitors arrived in groups of two to four people. More than half of the visitors (52 percent) had visited the park previously and had some familiarity with the area (*115*). As part of a study targeted at understanding the impact of intelligent transportation systems in the area, a 2002 visitor use survey showed 67 percent of respondents fell in a middle-age bracket from 36 to 60 years old with an overall median age between 46 and 50 years old. Two-thirds of the respondents had a college degree or more. Perhaps due to sentiments for reaching out to family inspired after September 11th, 2001, family groups rose from 71 percent in 1998 to 78 percent of survey respondents,

and another three percent of respondents said they came with family and friends. Group size remained roughly equivalent to 1998 sizes (*116*).

Most visitors came from surrounding states and metropolitan areas. Fourteen percent of the visitors came from Massachusetts, twelve percent from New York, eleven percent from Pennsylvania, and ten percent from Maine. Five percent of the visitors came from foreign countries, and nearly a third of them came from Canada. As their primary language, 95 percent of visitors spoke English (*115*). These figures, when compared to a 1987 visitor use survey, show a shift toward Acadia attracting more regional and international visitors. The 1987 study showed that the largest proportion of visitors, 22 percent, resided in Maine, and international visitors comprised only 2.8 percent of total visitation (*117*). The share of Maine residents rebounded some in 2002 to fourteen percent (*116*).

Visitors used Acadia as a vacation destination, which means that hoteliers could count on visitors to overnight in the area rather than pass through the area for an afternoon en route to another destination. Only four percent of visitors surveyed in 1998 spent less than one day visiting the park. 58 percent stayed for between one and three days, and eighteen percent had extended visits of eight days or longer. In total, 74 percent of visitor groups said they had stayed overnight directly on Mount Desert Island (*115*). Cruise ship passengers stay overnight on their ships, rather than in local lodging, but according to the Bar Harbor Chamber of Commerce, most ship passengers go back to one of their cruise ship destinations on a subsequent vacation. The Chamber distributes more lodging information to cruise ship passengers than to any other type of visitor, so these passengers represent potential for future contribution to the local economy.

For transportation, visitor groups in 1998 leaned heavily toward private vehicle transportation. Passenger vehicles without trailers brought 70 percent of the groups into the park, and 26 percent of the total number of groups used a private vehicle with a trailer at some point. Only 25 percent of visitor groups reported experiencing traffic congestion or parking problems in Acadia or on Mount Desert Island. One percent of the groups surveyed arrived by cruise ships. As the least utilized mode of transportation, less than one percent of visitor groups used the Island Explorer shuttle in 1997, which was two years before the service received an influx of equipment and operating resources to expand routes and frequencies to accommodate visitors. Visitor comments suggested an expectation of continued focus on private vehicle access. Of a total of 1,498 comments on every aspect of park management and operation, 329 visitor comments suggested park planners should provide more parking, 112 comments requested a free shuttle, and only 14 comments called for a ban on cars in the park (*115*). These figures showed consistency against the 1987 visitor use study, which showed that 90 percent of visitors used private cars, five percent drove recreational vehicles, and only one percent took the bus (*117*).

B.2.2 The Gateway Community: Bar Harbor, Maine and Mount Desert Island

The roads of Mount Desert Island weave between park lands and several gateway communities (Figure B-2). The Island Explorer shuttle serves the small island communities, as well as the airport nearby on the mainland. In 2003, the Island Explorer also started serving the Schoodic Peninsula to the east of Mount Desert Island. With park lands preserved as open space, development on the island has formed in nodes of commercial districts with some surrounding residential areas. Local towns collaborate

together through the Mount Desert Island League of Towns, which includes the towns directly on the island, as well as the surrounding communities of Trenton, Lamoine, and the Cranberry Isles (*118*). Citizens have also created an active citizens planning forum called Mount Desert Island Tomorrow (MDI Tomorrow), which facilitates civic involvement in planning issues, including transportation and the Island Explore.

Table B-3: Community Characteristics in the 2000 Census and Change from 1990

	Bar Harbor	Mount Desert Island[7]	Hancock County	Maine	United States
Population	2,659 -4%	10,917 +7%	51,791 +10%	1,274,923 +4%	281,421,906 +13%
Median Household Income	$33,609 +27%	$37,481 +33%	$35,811 +42%	$37,240 +34%	$41,944 +40%
Per Capita Income	$23,730 +68%	$22,984 +64%	$19,809 +60%	$19,533 +51%	$21,587 +50%
Population below Poverty	10.3% +0.8 pt	8.6% -0.9 pt	10.2% +0.2 pt	10.9% +0.1 pt	12.4% -0.7
Land Area in Square Miles (Square Kilometers)	3.1 (8.0)	108.1 (280.0)	1,587.7 (4,112.1)	30,861.6 (79,931.2)	3,537,438.4 (9,161,923.0)

On the eastern coast of Mount Desert Island, the largest community, Bar Harbor, has a population of 2,659 (Table B-3), 97 percent of which is white and half of which were born in Maine. Nearly one third of the population falls in the 35 to 54 year-old age range, and 18 percent of the people have reached age 65 or older. Between 1970 and 2000, Bar Harbor saw population growth of approximately ten percent, though the last decade brought a four percent decline. Growth has continued elsewhere on Mount Desert Island, where population grew seven percent between 1990 and 2000, meaning that gateway

[7] Mount Desert Island data were calculated by combining Hancock County census tracts 9659, 9660, 9661, & 9662.

community growth has occurred either in smaller development nodes on the island or in suburban areas, rather than in the largest town. Bar Harbor has a 20 percent housing vacancy in the city, of which 14 percent are occupied for seasonal or recreational use, which indicates that housing stock downtown is used nearly to capacity.

Income has grown in Bar Harbor and on Mount Desert Island; per capita income and growth in per capita income have outpaced state and national income and income growth. Poverty has also increased in Bar Harbor, whereas Mount Desert Island has seen a decline in poverty. The decreasing population and increasing poverty in the town core, compared with increasing population and decreasing poverty in outlying areas of the island suggest that the town center has experienced some flight to the suburbs. This migration has implications on how effectively a shuttle can serve the local population. Suburban transit service requires longer routes and greater resources. Suburban residents typically depend on motor vehicles because their commuting, shopping, and other trip destinations lie beyond walking distances. If shuttle service cannot efficiently reach residents where they live, they will take their private vehicles to the streets, adding to the traffic congestion and air pollution generated by tourist traffic.

Bar Harbor has a number of major employers; however, most businesses employ a small number of people (Figure B-3). The Jackson Laboratory provides over 1,000 jobs, but many of the Lab employees are not residents of Bar Harbor. The Mount Desert Island Hospital, College of the Atlantic, Acadia National Park, and Shop n' Save also stand out as significant employers, offering roughly 100 jobs each. Despite the large presence of these employers, 68 percent of the total business establishments on Mount Desert Island reported employing four or fewer people in 2000, and 85 percent had fewer than ten

employees. The average firm on the island employs nine people. Small shops, restaurants, hotels, and service businesses serve tourism crowds. New England tourism has a reputation for small bed and breakfast hospitality. Town planners report that people living on the island tend to work for small employers. Typically, middle and lower income employees live off-island.

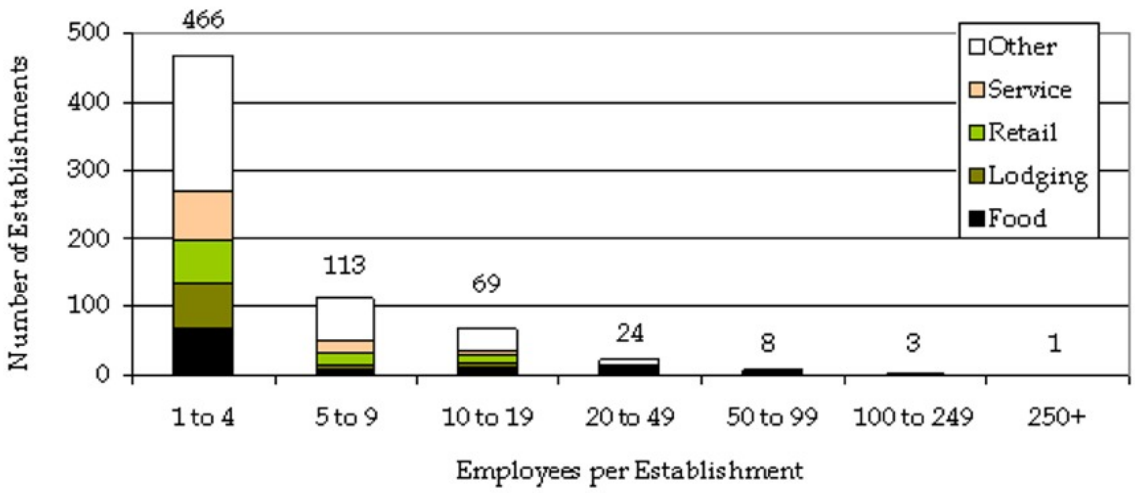


Figure B-3: Business sizes on Mount Desert Island[8] (*119*).

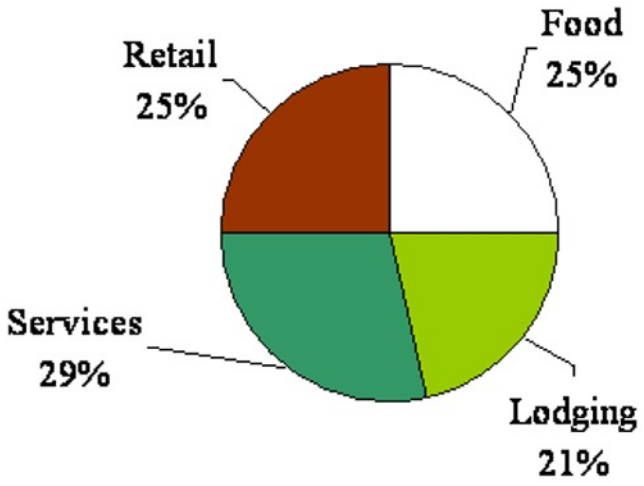
Mount Desert Island hosts few familiar American chain restaurants or other businesses. National chain restaurants find the short summer tourism season in Maine prohibitive for maintaining operations. Popeye's Fried Chicken opened and soon closed a location in Bar Harbor because the chain could not financially justify maintaining presence in the community through the slow winter season.

[8] Industry Code Summary tabulated for zip codes 04609, 04612, 04653, 04656, 04660, 04662, 04674, 04675, 04679, and 04690.

The Bar Harbor Chamber of Commerce primarily advertises tourism destinations, products, and services, and the Bar Harbor Chamber's office acts as a local visitor center. Membership in the Bar Harbor Chamber costs commercial businesses a base of $300 per year with larger businesses paying more according to industry-specific formulas. Locals estimate that 50 percent of the businesses in Bar Harbor have joined and almost all members live in the area throughout the year with their families. The policies of the Bar Harbor Chamber have diverse influences. Some individuals unaffiliated with businesses hold memberships to keep development interests in check with environmental awareness. Other communities on Mount Desert Island have separate chambers of commerce.

Business data over time reflect the importance of tourism. The University of Maine at Orono conducted a study of economic development on Mount Desert Island in 1989. The study showed that tourism industry establishments dominated growth of Mount Desert Island's and Bar Harbor's economies. Most of Bar Harbor's $12,431 in per capita sales came from the food and lodging sectors (*120*). Figures in the United States Census 2000 showed that 380 of the total 684 business establishments on Mount Desert Island served tourism. Of these establishments, food and lodging continued to hold a strong presence (46 percent of the tourism-related establishments); however, service industries dominated the tourism economy with 29 percent of the tourism-oriented businesses providing some form of service to tourists. One quarter of the tourism-related establishments offered retail products (Figure B-4).

Total: 380 establishments



Data Source: Census 2000 Industry Code Summary

Figure B-4: Mount Desert Island tourism business establishments.

Local residents in Bar Harbor consider this gateway community to be a tourism destination unto itself (Figure B-5). Businesses in Bar Harbor regard Acadia National Park as one of many assets in the area, along with whale watching, kayaking, the major island communities, and other attractions. The business community reports that many people who stop off in Bar Harbor ask, "You mean there is a park here?" For such visitors, Acadia provides a value added onto the tourism experience of Bar Harbor. This approach to tourism in the area differs from the situation in many of the rural parks in the West, where visitors come specifically to see the parks, discovering the amenities of gateway communities as surprising perks.



Figure B-5: Main Street in Bar Harbor serves as its own tourist destination.

For Bar Harbor, the harbor itself attracts a number of tourists to the area. The harbor provides facilities for small boats (Figure B-6) and four anchorages for large cruise ships (Figure B-7). Cruise ship traffic remains steady throughout the summer. The harbor often saw three or four ships moored at a time until the Bar Harbor Chamber of Commerce started publishing a schedule of landings on its web site in recent years. With that information available, cruise ship operators now self-regulate to keep one or two slips full all summer, rather than inundating the town with four ships at once. Spreading peak traffic gives each cruise ship greater presence, and local businesses can work more easily with an even flow of visitors coming ashore.



Figure B-6: The harbor serves high volumes of boat traffic.



Figure B-7: Cruise ships anchor in the harbor, sending tourists ashore en masse.

Hancock County maintains the other major access portal to the local area: the Bar Harbor – Hancock County Airport. The airport has two cross runways to accommodate traffic under variable coastal wind conditions. A 35-foot (10.7-meter) wide and 5,700-foot (1,737-meter) long taxiway opened in 2001. Airport improvement plans include terminal area aircraft ramp expansion, rehabilitation of the existing terminal area ramp, and 100 more car parking spaces (*121*).

The Town of Bar Harbor adopted its current comprehensive plan in November of 1993. Downeast Transportation was already providing limited transit service, primarily for the elderly and transit-dependent residents. The plan set a policy to encourage a transit system for tourists because adding parking spaces would not solve the traffic congestion of the tourism season. The Town wanted less reliance on the passenger car and more reliance on energy-efficient transportation, preferably privately owned and operated. This plan called for economic development through increased job opportunities with low environmental impact, which meant restricting the development of commercial amusements and preserving the current level of visitation by cruise ships and bus tours. The first goal of the plan established the need to preserve the town's character in terms of natural beauty and traditional New England culture, which required making new development as inconspicuous as possible (*120*). These goals set the stage for transportation and economic development in the 1990s. In 2002, Bar Harbor hired a new town planner, who intends to update the comprehensive plan starting in 2003.

B.3 The Island Explorer Shuttle

B.3.1 Current Conditions

Since 1999, Downeast Transportation has operated the Island Explorer for Acadia and its gateway communities. The service ran from June 23rd through Labor Day in 2002 with operations and maintenance costs at $500,000; operations extended to Columbus Day in 2003. In peak season, the buses run on a schedule from 6:45 in the morning to midnight with headways of 15 to 90 minutes, depending on route.



Figure B-8: The Island Explorer uses a new fleet of propane buses.

Downeast Transportation operates the fleet of 17 propane-powered buses owned by the National Park Service (Figure B-8). Buses seat 28 passengers, standees are permitted, and all vehicles have wheelchair access. Exterior and interior racks transport up to five bicycles per bus. Visitors may take pets both onto the shuttle and into the park. No significant conflicts among pets or between pets and people have been reported on the Island Explorer.



Figure B-9: Intelligent transportation systems in town (left) and at the visitor center (right) give real-time arrival information for each bus by destination.

The Island Explorer shuttle system stands as the prototype installation of intelligent transportation systems (ITS) for transit in the National Park Service (Figure B-9). The U.S. Department of Interior and the U.S. Department of Transportation selected Acadia National Park for a $2 million field operational test (FOT), which included technology for transit management, traffic management, and traveler information (*122*). For transit management, the Island Explorer uses global positioning satellite technology to locate buses and forecast when they will arrive at their next stops. Electronic message boards

(located at the main visitor center, at Jordan Pond in the center of the park, and in downtown Bar Harbor at the bus depot) communicate this arrival information to visitors for each bus route. A live Internet service map also shows the current location of all buses in service and whether they are running on time. This information can help visitors decide if they have time to take a short walk, visit a business, or explore the area in another way before the next bus arrives; planners envisioned local businesses would keep monitors in their establishments to display the live web page for their customers. The technology assists in performance monitoring and assessment, as well. Through infrared sensing, the intelligent transportation technology makes automatic counts of passengers on buses, providing a 100-percent count of ridership by time of day, bus, route, and stop location. This information helps transit planners better understand visitor flows, so the system can evolve to accommodate demand.

Acceptance of ITS technology did not come instantaneously, but people who have come in contact with it have integrated it in their routines. Downeast Transportation reported it had no major difficulties training drivers to use the technology because the operator purposely did not overwhelm the drivers with all system functions at once. In the 2002 survey of visitors, 80 percent of respondents who reported using the bus had made the decision to ride at least in part because they saw the real-time bus departure displays. Once using the system, 80 percent of respondents said the real time bus departure information saved them time, and 69 percent felt they saved time with the on-board announcements (*116*). Locally, the size and brightness of the lighted signs has generated discussion. People question if the technology could not have fit the character of the area better with a different design.

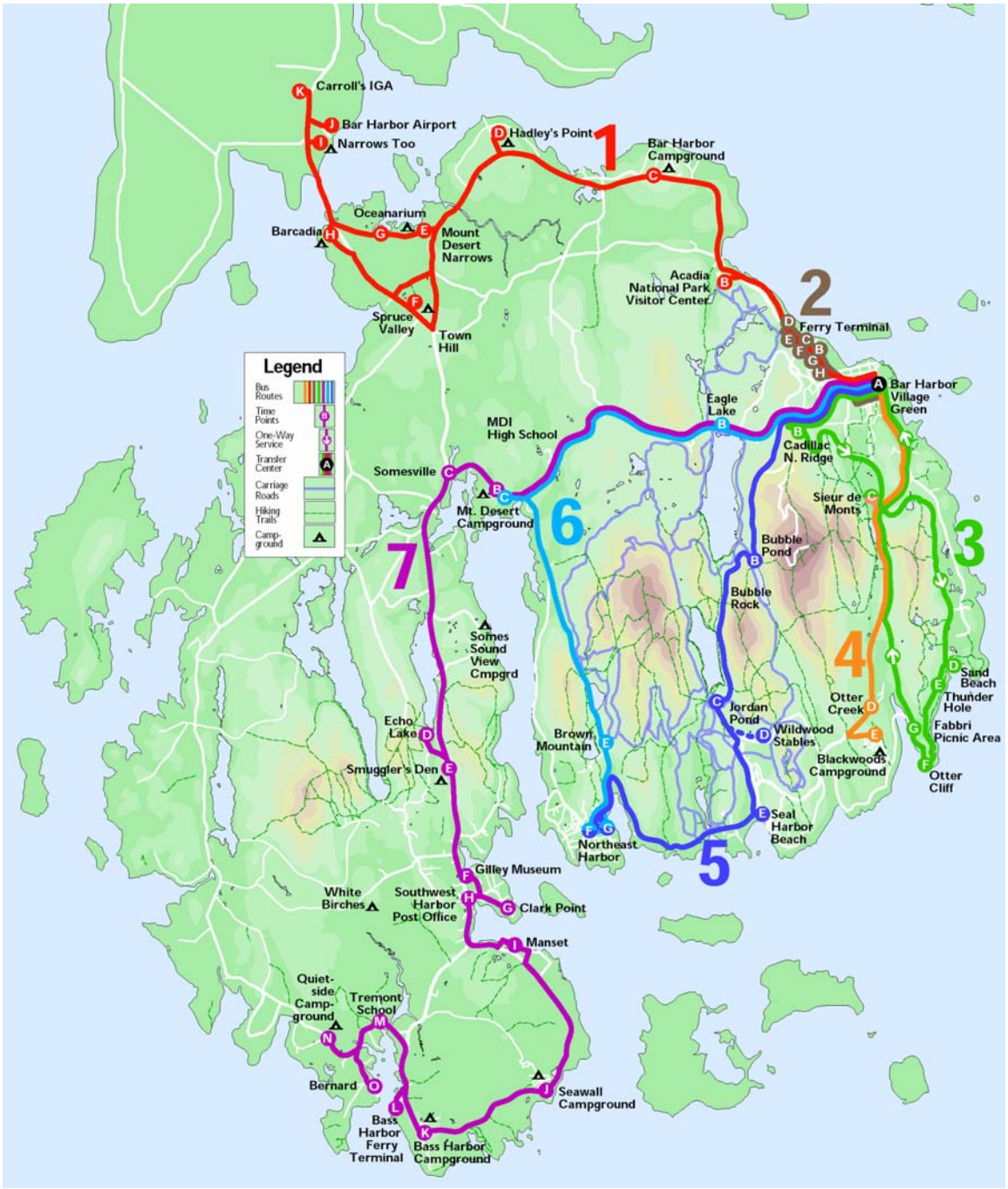


Figure B-10: Island Explorer Shuttle Routes on Mount Desert Island (*123*).

In terms of the transit system structure, buses travel a web of island roads (Figure B-10). The service covers all but the westernmost edge of Mount Desert Island. Private vehicles and private tour buses share these roads with the shuttle buses. Traffic on the eastern portion of the Park Loop Road (bus route three), which attracts large volumes of visitors, now flows in one-way movement to manage congestion. The shuttle buses do not go to the summit of Cadillac Mountain because this route is left as a niche for private tour operators and because the Island Explorer fleet does not have the engine power needed to climb the mountain efficiently. Many people interviewed expected that traffic levels in the future will necessitate private vehicle restrictions from park roads, and the Cadillac Mountain Road is considered a prime candidate for the first stage of restrictions (Figure B-11).



Figure B-11: Private vehicles wend their way up the steep curving road leading to the summit of Cadillac Mountain.

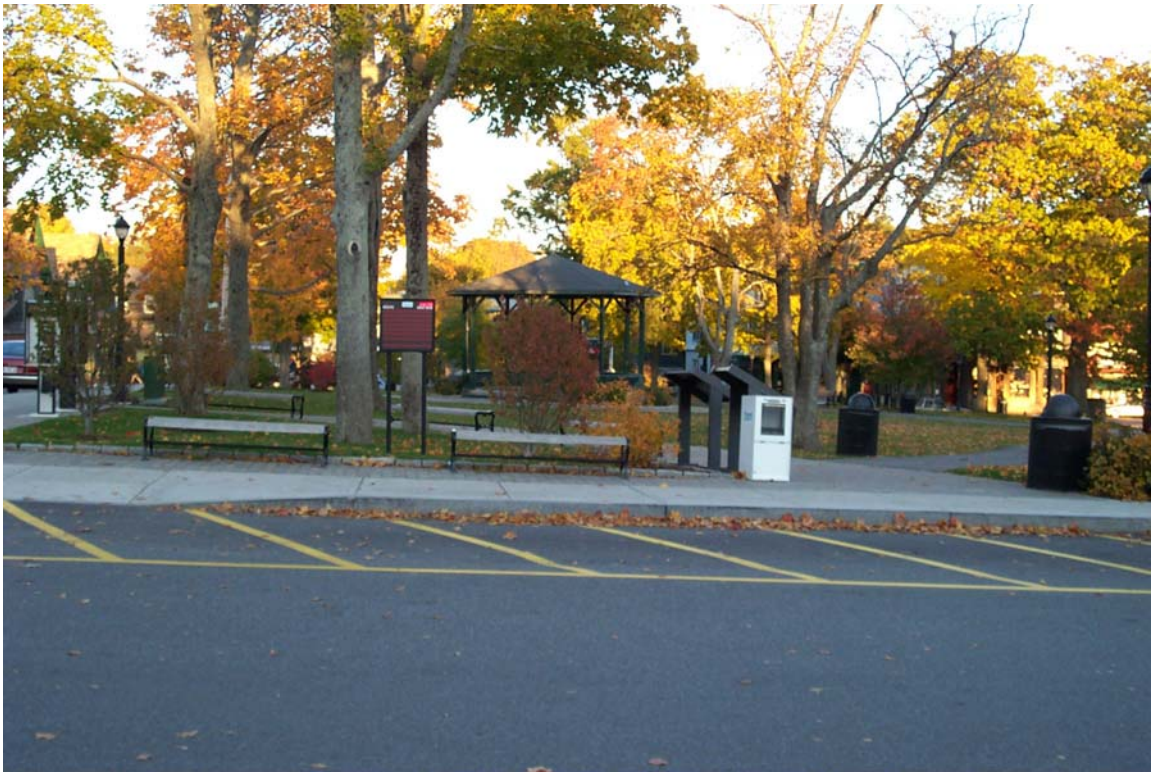


Figure B-12: Buses converge on the system hub in downtown Bar Harbor at the newly renovated Village Green.

The seven routes of the island are designed to distribute passengers among points where large volumes of visitors gather. The largest numbers of passengers come from campgrounds and hotels, so routes outside the park serve these locations. The central connection point sits on the Village Green in downtown Bar Harbor (Figure B-12). From this terminal, two feeder routes collecting passengers from hotels and campgrounds (routes one and two) meet the five distribution routes that serve the park and take passengers across the island.

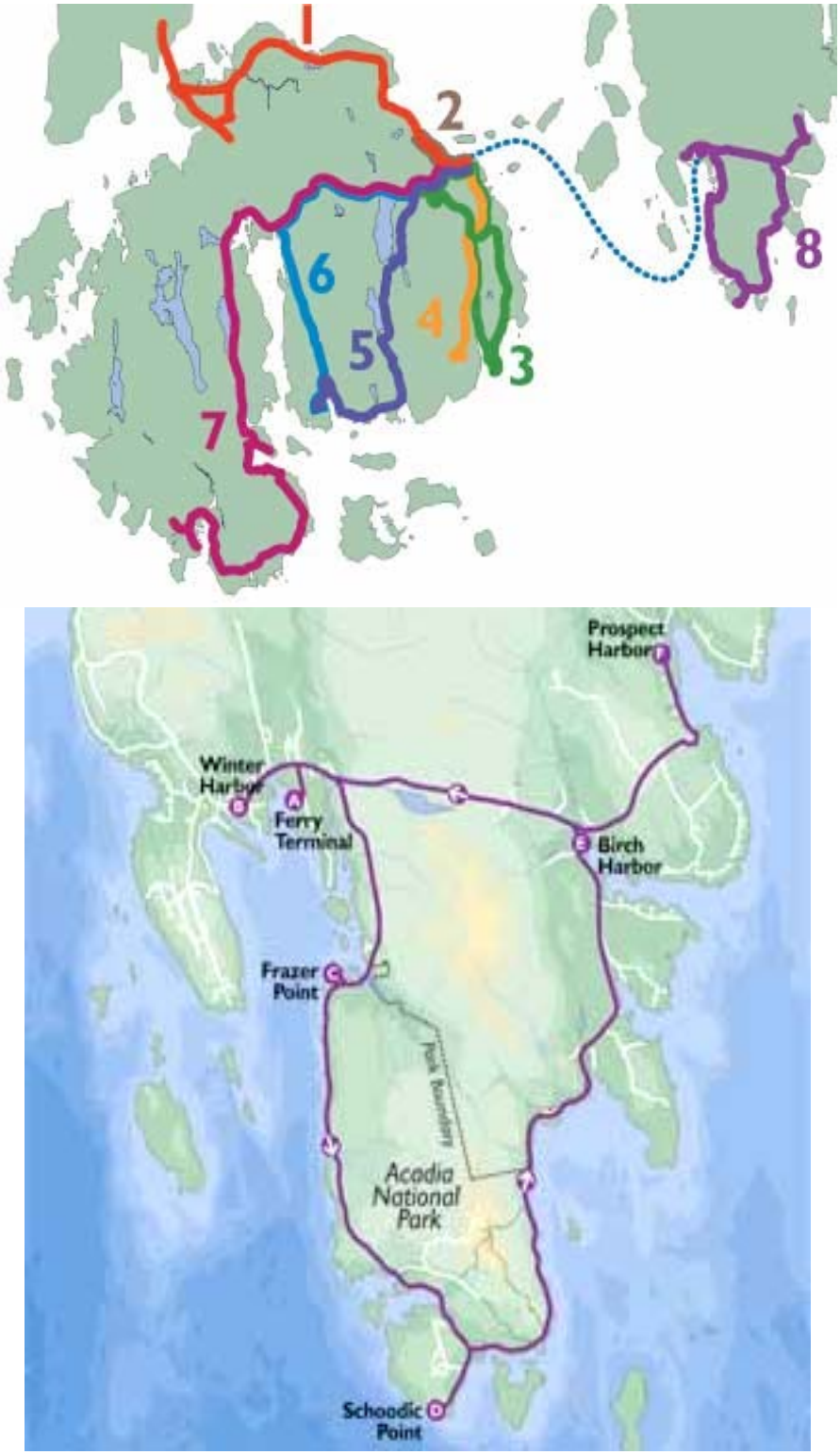


Figure B-13: Transit planners put an eighth Island Explorer route on Schoodic Peninsula in 2003 (*123*).

In 2003, Downeast Transportation added an eighth route to the Island Explorer service (Figure B-13). This route runs on the Schoodic Peninsula, which has no direct land link from Mount Desert Island. Private ferry service takes passengers between the island and the peninsula for a fee. Adult round trip fares ran $24 for adults and $15 for children under twelve years old in 2003 with an additional $5 charge for bicycles.



Figure B-14: The local airport advertises all manner of private vehicle transport with no mention of the Island Explorer.

Acadia National Park has a rare opportunity that most other rural parks do not have: it has an airport within a short driving distance. With the Bar Harbor – Hancock County Airport located just 21 miles (34 km) away from downtown Bar Harbor, the shuttle

service comfortably serves the airport on the northern end of bus route one (Figure B-14). The Island Explorer connects to the local airport and to the ferry terminal, and Downeast Transportation reports it is considering plans to connect to the airport in Bangor. The importance of creating a seamless connection to intercity transportation should not be underestimated. Visitors need a way to get to the park without a private vehicle. When visitors pay a daily rental rate on a private vehicle, they typically want to drive it. If they never rent the vehicle, the parking problems in Bar Harbor and Acadia can subside, and visitors will not feel anxious about leaving a vehicle far from where they engage in activities. In 2000, a survey of shuttle riders showed that most of the riders who had flown to the area had used the local airport (Figure B-15). None of the groups that said they had arrived at the Bar Harbor-Hancock County Airport had rented a car, while half of all the groups that had landed in Bangor had rented cars.

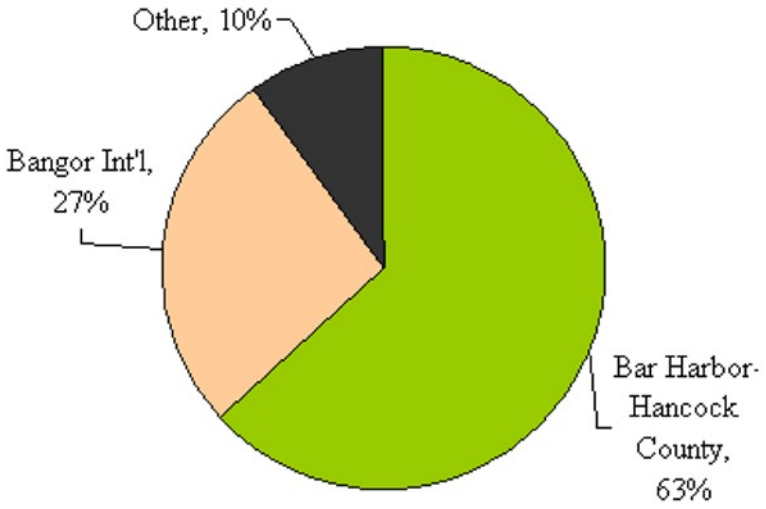


Figure B-15: Airports used by shuttle riders to arrive in the area in 2000 (*124*).

Bus stops are treated as a commodity. If businesses want a dedicated stop, they must pay an annual fee between $500 and $2,000, depending on the number of people served. The airport does not pay a fee. All businesses along bus routes are guaranteed access in that the Island Explorer operates on a flag stop basis: passengers can request a stop at any time, and people on the road can wave to indicate the bus driver should stop to allow them to board. Drivers stop at the nearest safe location. Few people use this flag stop system. Downeast Transportation estimates that 90 percent of its passengers use the fixed scheduled stops.

Downeast Transportation conducts its annual ridership survey in mid-August to keep attuned to public feelings on the service. Each year, the number of people responding to the survey has grown. Consistently over the first four years of surveys, riders have offered praise for the service with 99 percent consistently indicating the importance that the service should continue. Between 98 and 99 percent of respondents each year considered the drivers helpful and friendly, and 99 to 100 percent have considered the buses clean (*124*). Although people speak well of the buses, some local businesses and residents have complained about squeaking brakes that they heard throughout the day. The Island Explorer is addressing the problem with engineering changes.



Figure B-16: Improvements to the Bar Harbor Village Green brought landscaping and amenities for bus riders.



Figure B-17: Transit stops in towns have signs, but minimalist infrastructure and amenities, as at the College of the Atlantic.

The Island Explorer Shuttle launched into full service with limited infrastructure in place. The Town of Bar Harbor and the Maine Department of Transportation devoted efforts to restoring and redesigning the downtown Village Green as the bus route hub (Figure B-16). The green had fallen into disrepair, but renovation efforts introduced benches, a bus staging area, pedestrian paths, and landscaping (*118*). The National Park Service made initial renovations for a hub bus depot, which the Downeast Transportation now leases (*125*). Away from the downtown hub, most bus stops merely have signs identifying them (Figure B-17). Sidewalk space is not necessarily allocated for visitors, and wheelchair accessibility is not always in place (Figure B-18). Some people have complained about people sitting on lawns to wait for the bus. This lack of infrastructure will deter people in wheelchairs and fail to invite all visitors to try the service.



Figure B-18: Although buses meet accessibility standards, park infrastructure still needs reconstruction to accommodate wheelchairs.



Figure B-19: New infrastructure at the Sand Beach bus stop shows the amenities that will appear at other stops in the system, as well.

Acadia has developed a design for new infrastructure, which will be phased into construction over time (Figure B-19). Acadia was awarded funds for parking lot redesign and construction through the Federal Lands Highway, as well as improvements at roughly 30 bus stops in the park. As this infrastructure becomes more common at stops, it will act as a highly visible advertisement for shuttle service, particularly if people circle for parking nearby.

B.3.2 History: Goals and Lessons

B.3.2.1 Goals

The Acadia General Management Plan, which the Park adopted in 1992 as the first such plan in the park's history, aimed to reduce the perception of crowding in the park.

Park Administration wanted to replace private automobiles in the park with non-motorized access and a public transportation system. As part of the overall transportation plan, the Park is managing parking capacity and keeping the number of parked cars to a minimum, particularly where parking in high traffic areas poses a safety hazard. As a part of the initiative to provide additional access for disabled persons, transportation systems must provide effective services for accessibility (*117*).

Regional communities took initiative to work with the National Park Service to find means of mitigating common traffic congestion (*126*). Primarily, island partners backing expansion of the Island Explorer system aimed "to help sustain the strong tourism industry on Mount Desert Island while reducing traffic congestion and motor vehicle emissions (*118*)." Acadia National Park has launched initiatives to determine carrying capacities for Mount Desert Island. In August 2001, the Park hosted a visitor capacity charrette to determine how many visitors specific areas can handle without unreasonable impact on the resource. The charrette considered both large-scale capacity for all park lands and Mount Desert Island and small-scale capacity for the sites at Jordan Pond and Cadillac Mountain (Figure B-10 and Figure B-11). Among other ideas, charrette participants recommended public transit for Cadillac Mountain, a parking plan for the park that would establish no net gain in parking spaces, continued investment in intelligent transportation systems, and a car-free test of the Park Loop Road using the Island Explorer during a busy time of the off-season (*127*).

Some people see the shuttle as the first step toward restrictive policies to keep the popularity of the area from destroying the environment and the quality of the visitor experience. As one possibility, a visitor reservation system could limit the number of

people who access the park at a given time. Such a system would limit the impacts of a projected doubling of visitation to six million annual visitors by 2020 (*128*). Although current policies favor public transportation over private vehicle restrictions, many people endorse or simply expect to see such future restrictions.

Mount Desert Island has experience with private vehicle restrictions. In the early days of automobiles, Mount Desert Island prohibited them, and visitors arrived by steamboat. After the law changed to allow private vehicles, cars came in droves. John D. Rockefeller, Jr. initiated a 27-year project to build carriage roads and sixteen granite bridges, which he donated as park land under the stipulation that no cars ever use them, and that policy holds today (*129*). Acadia's General Management Plan calls for private vehicle restrictions near Southwest Harbor on Valley Cove Road from a point near Fernald Point Road (*117*). As mentioned, some island stakeholders foresee Cadillac Mountain as the first logical place to restrict private vehicles. Potentially, the first step will restrict recreational vehicles before targeting passenger cars. With the concept of private vehicle restrictions openly discussed in the community, business representatives emphasize that further expansion of transit must accompany private vehicle restrictions.

The Park and local communities are also interested in improving air quality or at least avoiding exacerbating existing pollution with high levels of emissions from private vehicles. Acadia sits in a particularly difficult position: the place where winds converge from the west, carrying pollution from northeastern metropolises. The area holds the nickname "Downeast" to describe its downwind characteristic (*130*). An estimated 80 percent of the area's air pollution comes from other states, and with this imported pollution, Hancock County has earned an "F" for air quality for the last four years, and

smog exceeded Environmental Protection Agency standards for nine days in 2002 (*131*). Acadia National Park and the Saint Croix Island International Historic Site set a performance goal for air quality to remain stable or improve from 1997 levels by September 30, 2005 (*130*).

B.3.2.2 Transit History and Plans

Downeast Transportation started the Island Explorer as a small service in 1993 to serve campgrounds. To support costs, the nonprofit transit corporation charged a $2.00 fare and assessed fees to private campground operators and the Park Service campgrounds. Although the service attracted some ridership, congestion on Mount Desert Island continued to grow. In 1996, the Mount Desert Island League of Towns, Acadia National Park, and Downeast Transportation jointly applied to the Maine Department of Transportation for Congestion Mitigation and Air quality (CMAQ) funds in order to expand shuttle service to serve the tourist population. Voters in four local communities approved proportional funding to provide a local match for the grant, while Acadia National Park dedicated a portion of visitor entrance fees. Friends of Acadia and the Bar Harbor Chamber of Commerce secured additional funding (*126*).

System planners established three phases for expanded service. The first phase began in June 1999 with eight buses circulating on six routes. Phase two in June 2000 brought nine more buses to the current total of seventeen, which allowed more frequent service on the town routes and continuous service on Park Loop Road. The third phase has yet to occur, and it has no schedule. This phase involves coordination initiatives, such as a regional tourist center and multimodal transportation hub with connections for regional and international transportation systems (*118*). The multimodal center will offer a day-

use combined visitor center, transportation hub, and parking area near the head of the island. While the existing system mitigates traffic from visitors staying on the island, the park-and-ride lot will address congestion created by visitors and employees who come to the island in the morning for the day. The regional coordination aspect of the third phase fits in a state plan for car-free tourism with potential for train service to Trenton (just north of the island) and high-speed ferry service to the island.

Expansions have also occurred outside of the three-phase plan. Many people supported the idea of extending service so the service would end on Columbus Day in October, rather than Labor Day in September. Downeast Transportation extended the season to Columbus Day in 2003, and potential still exists to offer year-round service, primarily for commuters in the off-season (*125*). For peak season, high ridership has led to plans for further fleet expansions in 2004 and 2005

Stakeholders and residents have also discussed the possibility of a loop route serving the businesses of downtown Bar Harbor and providing transportation for people to get across town with an electric zero-emission shuttle. Proponents cite heavy downtown traffic as a reason to provide the service. Downeast Transportation cites downtown traffic as a reason why downtown operations would be difficult. In particular, he transit operator would prefer not to operate on College and West Streets, which are two of the primary commercial streets in town.

From the start of the first phase of operations, demand for the Island Explorer shuttle service exceeded expectations. With a goal of attracting 1,000 riders per day and an expectation for 700, ridership of 2,000 to 3,000 passengers per day in July and August of the first year of operations in 1999 took transit operators by surprise (*118*). Based on

these numbers, the Department of the Interior estimated a reduction of 1.3 million vehicle miles traveled on park roads in the first summer of operation (*126*). Demand sometimes exceeded capacity. Because of the popularity of bicycling in Acadia, bus bike rack capacity sometimes could not handle the number of people who wanted to transport their bikes. Visitors generally took the crowding in stride (*118*). Passengers in 1999 noted problems with scheduling and operations, but negative comments decreased in 2000 when the bus fleet grew from eight to eighteen. By 2002, ridership had increased to the point where demand started exceeding capacity again, so complaints of overcrowded buses with too little frequency returned (*124*).

B.3.2.3 Lessons from Experience

With a professional transportation consultant working on the transit system from the start of large-scale operations, the Island Explorer planning process did not encounter many striking negative surprises. Operators close to the system noted:

- System designers found that running buses through the hub as a middle point on routes did not work because people got confused about which direction buses would go; therefore, all routes needed to terminate at the hub.
- The Island Explorer planners found that service routes should appeal to more than one destination.
- Operationally, Downeast Transportation had difficulty understanding what was happening in the field in the first year because the buses had no radio equipment. System experts caution other parks they must launch service with radio communication from the start to avoid unnecessary confusion.

The largest lesson learned in the Island Explorer experience regarded the value of partnering (*132*). The system has always benefited from the support of government at many levels, transit expertise, and Downeast Transportation's longstanding transportation experience in the local area. Island communities and Acadia administrators all recognized the need for the service, so each in their own way contributed efforts and funding to make the service happen. The partnership, which ultimately included 22 signatories, involved government at local, state, and federal levels, as well as nonprofit and for-profit businesses. Voters in local communities showed through referenda the willingness of the gateway population to support the system. Friends of Acadia and the Bar Harbor Chamber of Commerce showed how nonprofit groups and business associations can pursue and generate important sources of funding and support for a transit system (*126*). The success of the Island Explorer partnerships has appeared in many publications and stands as a model for other parks and gateway communities to emulate.

With the Island Explorer, a fare experiment unique in national park transit showed the impact fares have on attracting or discouraging riders in park and gateway community settings. Friends of Acadia gave a $6,000 grant to Downeast Transportation in 1997 to subsidize eliminating the $2.00 fare on the small one-route campground system. Without any expansion of service, ridership rose 600 percent. With additional fare-free frequency in 1998, ridership increased again from 12,000 passengers in 1997 to 15,000 passengers in 1998 (*125*). Of the visitor groups surveyed in the 1998 visitor use study, 48 percent said they would willingly ride a free shuttle bus, though only 25 percent said they would pay a fare to ride a shuttle (*117*). With this experience and information, partners

supporting the Island Explorer grew dedicated to the principle of fare-free service. Over the years of ridership surveys, between 91 and 95 percent of respondents said it was important for the service to remain free, though some people comment that they believe a small fare should be charged. Many people said that they would like to contribute something, so the system designers provided the opportunity for people to make a donation to the system, recommending a two-dollar donation (*124*).

B.4 Impacts

The integrated nature of Acadia National Park and seasonal local communities makes it difficult to isolate economic impacts of the park and its associated administrative actions, such as the expansion of transit service, from other influences on the local economy. Over the years, various economic studies have produced different results. The studies generally recognize that Acadia provides recreational and cultural venues that attracts visitors to the local tourism economy, as well as jobs. The presence of the park also likely increases prices of land and housing, taxes, and traffic levels (*117*).

B.4.1 External Influences

A variety of factors influence changes in the tourism industry on Mount Desert Island and visitation at Acadia National Park. At a fundamental level, tourism communities must accept the significant effects of basic factors, such as weather and wildfires. Nearby tourism venues with big events might have minor or major impacts, and these impacts could compliment or compete with park attractions, depending on how tourists plan time.

Two important external factors affected the overall American tourism industry late in 2001: the economic recession and the terrorist attacks of September 11th. Industry

experts cite increasing and decreasing influences on tourism since the attacks. People might be staying home for fear of terrorism or to save money. On the other hand, perhaps they are spending less money on vacations by driving to parks than tourists would spend if they were to travel far from home. Although foreign visitation to national parks is down, Americans are traveling domestically and identifying with national treasures. The Bar Harbor Chamber of Commerce noted a reduction in European visitors, but American family reunions and driving tours increased because at a time of national security fears, people feel safe in the quaint atmosphere of Mount Desert Island.

The Maine Office of Tourism sees general slowing in tourism based on the economic downturn and the effects of September 11th, but tourism promoters are taking steps to compensate. The office reported steady growth in tourism from 1995 through 1999, but 2000 brought a slowdown and 2001 showed only a small increase. Analysts attributed much of the problem to increasing competition from other states for tourism dollars. The State of Maine has traditionally spent less money to foster tourism than most states have, despite the importance of tourism as a primary industry for the state's economy. New tax legislation is addressing this discrepancy in 2003 to raise the State annual tourism marketing budget from $4.6 million to nearly $7 million through revenues from the lodging and restaurant industries (*133*). The Acadia region holds particular importance in Maine. U.S. travelers to Maine spent an estimated $5.6 billion in tourism-related food, lodging, retail, and service industries in 2001 (*134*), and 28 percent of all people on overnight marketable pleasure trips to Maine visit the Downeast Acadia region (*135*), making it the third most visited region in the state. To explain the slow economy in the area in recent years, the Bar Harbor Chamber of Commerce cites lower visitation from

California and higher numbers of tourists from the northeast region, but the Chamber perceives the change of place of origin has not affected overall numbers.

Many cruise ship destinations have seen the effects of the Norwalk virus on tourism. Because cruise ships operate under a competitive private sector system, the operators do not readily provide data on passenger demand; however, as an international cruise ship destination, Bar Harbor might have seen a decrease in cruise ship passenger traffic due to fears of the virus.

B.4.2 Employment

Operation of the Island Explorer created employment opportunities in the local community. The shuttle opened 47 positions for drivers, as well as four jobs for shift supervisors. With the dense population and the transit-oriented culture in New England, Downeast Transportation found skilled and commercially licensed drivers for the Island Explorer service available in the region. The operator estimates that about three quarters of the staff comes from within 50 to 60 miles of Mount Desert Island, and probably a quarter live on the island itself. Downeast Transportation did not provide specific information on starting wages, but the operator did state that it probably pays in the lower end of average tourism industry wages, but in the higher end of average for transportation jobs, such as school bus driving, which starts at $8.47 per hour plus health insurance in Hancock County[9] (*136*). The average hourly wage for all employment in Hancock

[9] Bus driver wage for the 2003-2004 school year in Hancock County is calculated from the nine-month annual starting salary. Hourly wage $8.47 = $6,100 reported 9-month salary ÷ 9 months ÷ 20 days/month ÷ 4 hours/day

County is $13.13[10] (*137*). Island Explorer drivers make a better hourly wage than tour bus drivers do, but shuttle drivers do not take gratuities. Downeast Transportation reports a high retention rate among drivers with many drivers still working with the shuttle since the initial expansion of the service in 1999. Drivers come from a cross section of the local population, including school bus drivers on summer break, retirees, and some recreational vehicle drivers. Downeast Transportation generally tries to hire people who already hold commercial driver's licenses, but the operator has helped a few drivers obtain licenses.

Anecdotally, the Island Explorer creates a positive employment impact in private sector businesses unrelated to transportation. The shuttle has enabled employment both in businesses with off-site housing for employees and with employers with staff below driving age (*138*). One store owner claimed to have lost three quarters of the store's staff on the day when shuttle operations ceased for the season. The store's seasonal workers depended on the shuttle for transportation because they had no private vehicles. This story suggests an important implication: shuttle service in the gateway community provides mobility to enable people without vehicles, such as elderly community residents or seasonal college students, to take jobs, providing employment for people otherwise disenfranchised and filling positions that might otherwise remain vacant.

Even though system planners intended the shuttles for tourists, commute trips by bus have taken a prominent role in the flow of the local community. In the first four years of service, an average of between five and eight percent of riders used the shuttle for commute trips. Dependent on destinations served, some routes served more commute

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[10] Wages come from the fourth quarter of 2001 as reported through the Maine Department of Labor. Hourly wage = $525 reported average weekly wage ÷ 40 hours/week

trips. For instance, on the Southwest Harbor route (route seven on Figure B-10), thirteen percent of riders in 1999 used the shuttle to go to work (*124*). This travel behavior should be encouraged because it helps reach identified goals of transit: it reduces traffic congestion, frees parking spaces that would otherwise remain full all day, and reduces local contribution to air and noise pollution.

The shuttle also creates opportunity for economic expansion where local ordinances designed to protect local character and quality of life have effectively capped growth. For instance, the Jackson Laboratory, the island's largest employer, needs to provide two parking spaces for every three employees under local zoning. With practical obstacles to increasing on-site parking, the Island Explorer offers a way to investigate modifying local ordinances to promote economic growth without harming community character. The Jackson Laboratory has done origin-destination studies for employee commute trips to determine the feasibility of a dedicated shuttle.

Stakeholders interviewed suggest and encourage express shuttle routes to large island businesses around peak commute times. Express buses to employment centers at commute times would encourage more of the labor force to take the shuttle. Under the current system, the many stops for tourists substantially lengthen travel time for commuters.

B.4.3 Visitation Patterns

Business people in gateway communities worry about a primary question related to transit: do people stop coming to parks when transit is introduced? If the number of visitors declines, then the number of people spending money in local businesses declines and the local economy suffers. Similarly, if transit causes an increase in visitation, an

upswing in the local economy would likely occur. The 1998 visitor use study showed that 29 percent of visitor groups that stayed on the island lodged in motels or hotels, twenty percent stayed in private campgrounds, and many other groups stayed in other smaller types of private accommodation (*115*). Given that 2.8 million people visited Acadia in 2002 and 60 percent of surveyed visitors that year reported spending over $300 (excluding hotel and rental car costs) during their visits (*116*), the gateway communities surrounding Acadia can expect to feel strong economic impacts if transit contributes to either attracting or repelling visitors.

Comparative trends in visitation cannot be taken at face value. Acadia's visitation experienced a sharp decline after the first year of transit service in 1999, then numbers grew in all three subsequent years (Figure B-20). At the same time, parks throughout the nation and notably, in the Northeast Region of the National Park Service, saw increasing visitation; however, most of the parks in the Northeast Region are historical sites, often located within major metropolitan areas. The changes in visitation that appear in the region are probably defined more by day trips to individual sites, rather than by fully planned vacations to rural parks. Acadia is one of the smallest rural parks in the national park system, yet its visitation is comparable with many of the larger parks out west. According to visitation figures, Acadia's drop in visitation began before the start of shuttle operations. In this time period, the Northeast Region's visitation sustained levels high above 1996 visitation numbers, and state parks in Maine have shown sporadic visitor use. The rural state parks have indicated overall increases in visitors from 1.8 million visitors in 1996 to 2.5 million in 2002, but the numbers have shown extreme variation in recent years with no pattern to provide a baseline for comparison to the

experience in Acadia since the introduction of transit. Overall, Acadia's visitation numbers give little insight into the reaction of visitors to transit and the subsequent impact on the local area.

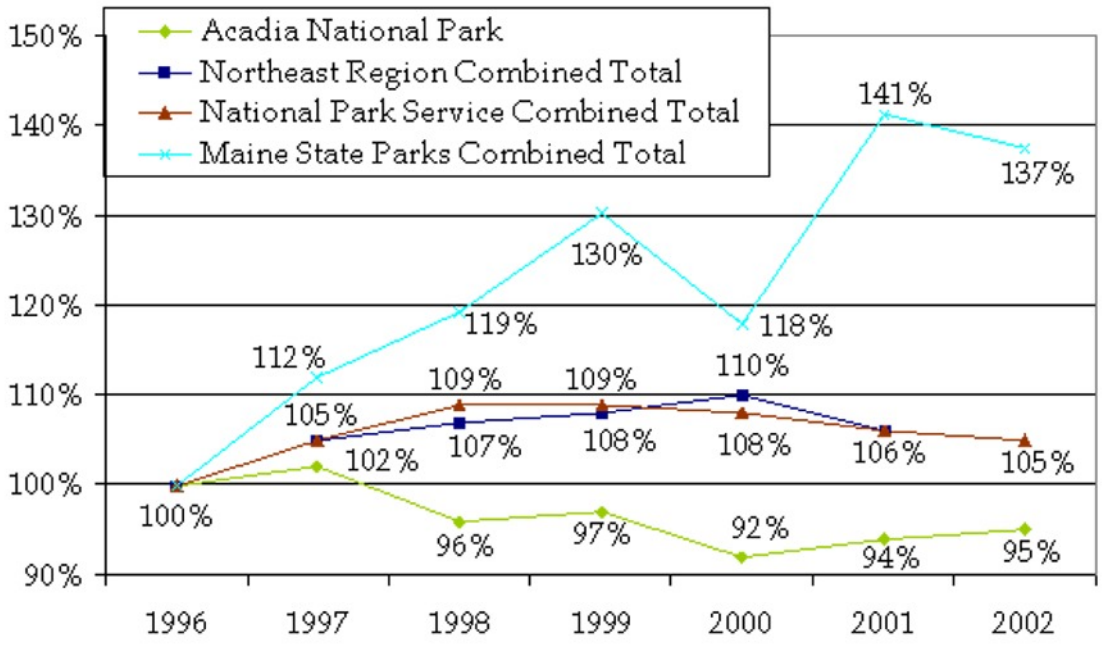


Figure B-20: Park and Regional Visitation Relative to 1996 Levels.

True trends in visitation cannot be determined by these numbers alone because changing the balance of people in buses versus cars affects the way the National Park Service counts visitors. Acadia calculates Mount Desert Island visitation as the number of vehicles crossing over a sensor on the Park Loop Road on Mount Desert Island. Based on this vehicle count, an expansion multiplier estimates the number of vehicles in other parts of the park on the island, which are not monitored. The sensor detects the difference between buses and private cars. Each type of vehicle has its own statistical multiplier for

the number of passengers per vehicle, and each multiplier has its own implied statistical error. Park statisticians multiply the expanded estimate of passenger vehicles by three to estimate the recreational visitors to Mount Desert Island, and analysts attribute 45 passengers per bus. Similarly, another traffic sensor provides base data for visitation estimates on Schoodic Peninsula. Data for Isle au Haut come from ferry counts (*139*). The addition of transit and subsequent changes in visitor mode choice shifts the balance of visitation calculated against a number of private vehicles versus visitors multiplied by an expected ridership on buses, so the calculation for determining visitation changes.

Whereas the calculation of visitation has changed, Maine Department of Transportation vehicle traffic counting offers data consistency before and after the expansion of transit service. Traffic count stations showed increases in annual average daily traffic in on most major roads of Mount Desert Island between 1996 and 2001... before and after the expansion of shuttle service (Figure B-21). Traffic leading onto the island from Bangor and other areas on the mainland increased 15.8 percent, and the one road directly accessing the island, which also includes surface traffic from the Bar Harbor – Hancock County Airport, saw an 18.1 percent increase. These increases in traffic came despite a six percent decrease in visitation in the same period (Figure B-20), which suggests that fewer people were traveling per vehicle, visitor groups were taking more trips than they formerly did, or the visitation counting methodology was flawed.

Changes in traffic patterns illuminate mobility needs. Major thoroughfares across the island realized traffic changes comparable to the island access roads. The Park Loop Road saw a 21.3 percent increase, and on the primary link between the east and west sections of the island at Somesville, traffic rose between seventeen and eighteen percent.

Roads in Northeast Harbor that carry more local traffic than tourists saw negligible increases of less than one percent, and one of the most remote parts of the island south of Southwest Harbor saw a decrease in traffic.

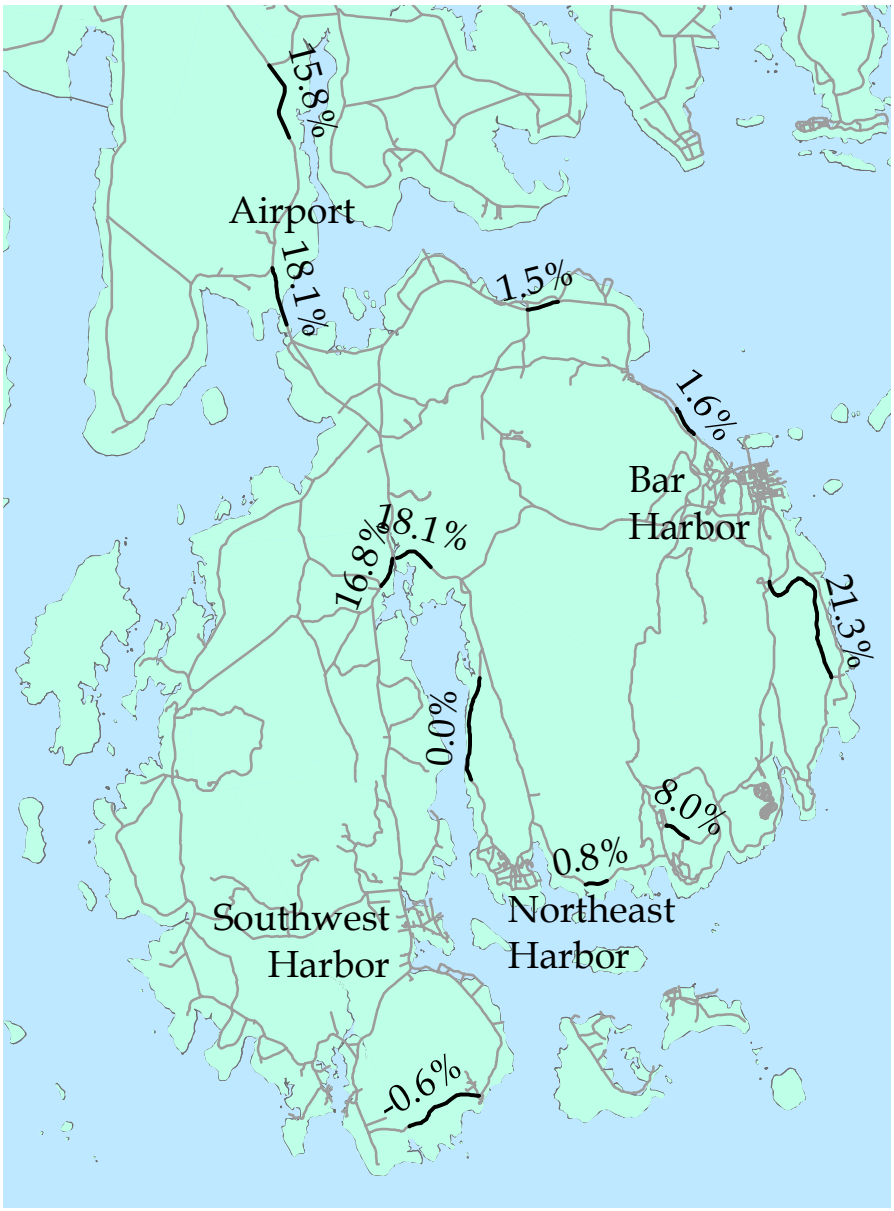


Figure B-21: Growth in Average Annual Daily Traffic from 1996 to 2001.[11]

[11] Data for this analysis came from Maine Department of Transportation annual traffic volume counts. Traffic counter locations depicted on the map are approximate.

Notably, primary access roads to Bar Harbor from the north only saw traffic rise by 1.5 to 1.6 percent. The Island Explorer serves these road links and the businesses on them (routes one and two in Figure B-10 serve campgrounds and hotels on this road segment and carry half of all shuttle riders), which suggests that the shuttle has had a role in mitigating traffic increases along its most popular hotel and campground routes. Interviewees for this study reported they had seen no change in traffic levels in Bar Harbor, and the data add credibility to this observation; however, the data show that these people might have observed a twenty percent increase in traffic without the Island Explorer. The highest increase in this study… 21.3 percent… occurred on the Park Loop Road, which contains the most popular attractions in the park. This increase indicates that the shuttle has fallen short of its goal to reduce traffic in the park. The traffic counts suggest that the shuttle serves businesses well, but the park continues to have mounting traffic problems.

Environmental consequences of the shuttle system can be expected to have a long-term impact on visitation that will be difficult to isolate. Reduction in vehicle noise and air pollutants improves the quality of visitor experience. Although future surveys might assist in identifying general trends, many visitors might not realize that the absence of a noise or pollutants is what makes a place special for them. Particularly in Acadia's precarious downwind location, reductions in local pollutants could make a substantial difference in how attractive the park looks to visitors. In the first four years of service, analysts estimate the propane powered Island Explorer reduced island traffic by 300,000 vehicles and prevented 24 tons of nitrogen oxide and volatile organic compounds from entering the air (*131*).

B.4.4 Ridership

Given the difficulties in interpreting visitation data through changes in how visitors are counted, ridership data offer important insight into the question of whether transit affects decisions to visit parks. Trends in ridership give some indication of whether people find the service attractive enough to use repeatedly or whether they prefer to avoid the system.

With 52 percent of ridership in the park and 48 percent on town routes in 2002 (Figure B-22), demand for the Island Explorer service splits evenly between town and park visitor amenities and attractions. Only routes one and two serve town traffic, compared to the other five routes serving the park and the rest of the island (Figure B-10), which means the park routes require more buses operating hours to serve roughly the same number of passengers as ride on the two town routes. This imbalance shows the need for the town routes to serve as feeders to the park transit system.

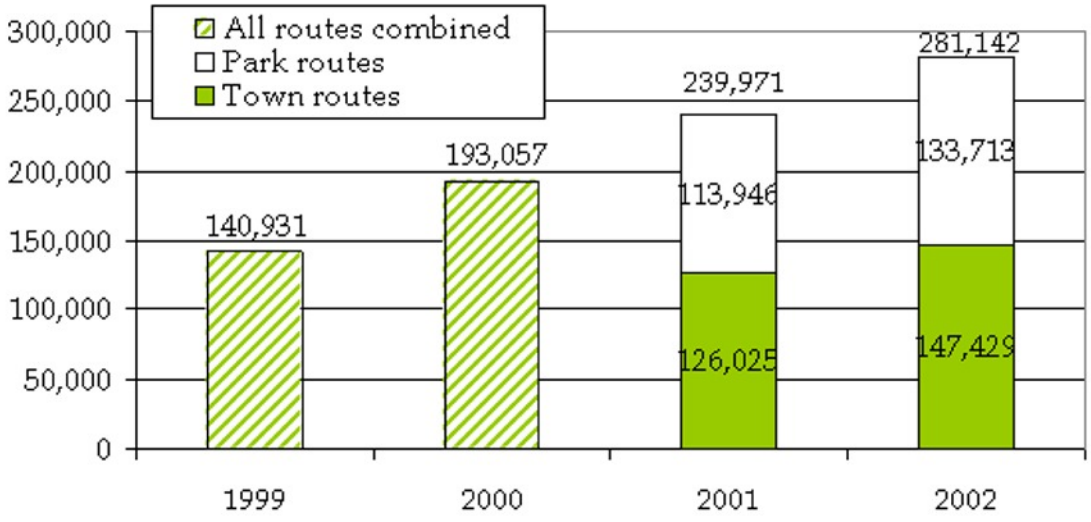


Figure B-22: Trends in peak season ridership (June 22nd through Labor Day weekend).

The balance of people riding in the park versus in the town has implications on the way that transit service affects local economies. If visitors choose to ride the shuttles only in the parks, then the flow of people among businesses in gateway communities would be expected to remain unchanged. With a town ridership of 147,429 and 2002 visitation at 2.8 million, a small proportion of people have switched from private vehicles to transit for transportation in the town. Most people went about the town as they always have; therefore, visitor access to local businesses has remained largely unchanged.

Total ridership has increased in each year of operation (Figure B-22). Increases in ridership indicate one of two things (or a combination of the two): either more people are taking transit, or the people who take transit are taking more trips by transit. Visitors and locals have different motivations for changing ridership numbers in these categories (Table B-4). Factors such as perception of transit service quality, perception of private vehicle congestion, and private vehicle restrictions will affect trip-making for all visitors and locals. Demographic composition will likely affect both the proportion of people using transit and the number of trips taken per person. Determining the extent to which these phenomena are happening will require a survey of park visitors; however, based on existing data, increasing activity is happening with the transit systems as gateway community residents and visitors to the park get more familiar with the systems. As experience with the transit systems grows, people are using the system more.

Table B-4: Factors affecting the number of trips by transit

	The number of people using transit	The number of trips taken by people already using transit
Visitors	• Trends in total visitation • The proportion of visitors using transit	• The total amount of time visitors spend in the area • Trends in windshield tourism versus stopping to visit attractions • The amount of time spent at each stop (e.g. hours spent hiking a trail versus minutes spent at each of many stops) • Various trip purposes (sight seeing, trail access, dining, or other trips)
Locals	• Trends in permanent or seasonal population • The proportion of locals using transit	• Various trip purposes (commute, shopping, recreational, or other trips)

Ridership has consistently risen despite fluctuation in visitation (Figure B-23). Most notably, between 1999 and 2000, visitation dropped by 59,236, yet ridership rose by 48,285 or 38.2 percent. A different scenario occurred in later years. With increasing visitation in 2001 and 2002 over previous years, increasing ridership suggests that as more people come to the park, transit activity has increased. More of the trips people take are occurring on public transportation. Congestion likely affects this situation. As more people come to the area, traffic problems grow less tolerable, so people divert to alternative modes of transportation. Communication and the reputation of the system also likely affect the proportion of trips taken on transit. As people become more familiar and comfortable with the systems, they will likely use the systems for more trip purposes, and word will spread to other people about the convenience of the service.

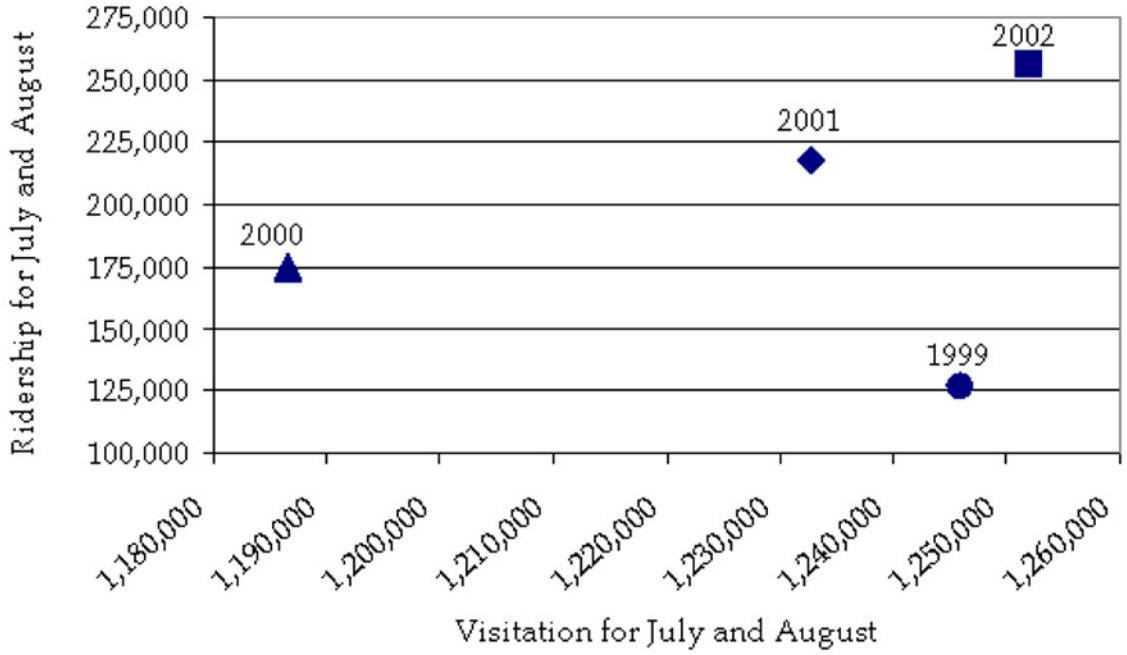


Figure B-23: Trends in the relationship between ridership and visitation.

The relationship between ridership and visitation after 2000 suggests a possible pattern regarding the reaction of visitors to transit: visitors choose transit when the number of people in an area increases. Increasing ridership in Acadia as visitation rises each year suggests that crowds and congestion motivate interest in transit. People might see transit as an attractive alternative when crowding would otherwise force them either to sit in traffic or to stay away from the parks altogether. In this sense, transit might allow parks and gateway communities to maintain high levels of visitation comfortably at times when reputations of crowded conditions could otherwise encourage people to consider planning their vacations elsewhere.

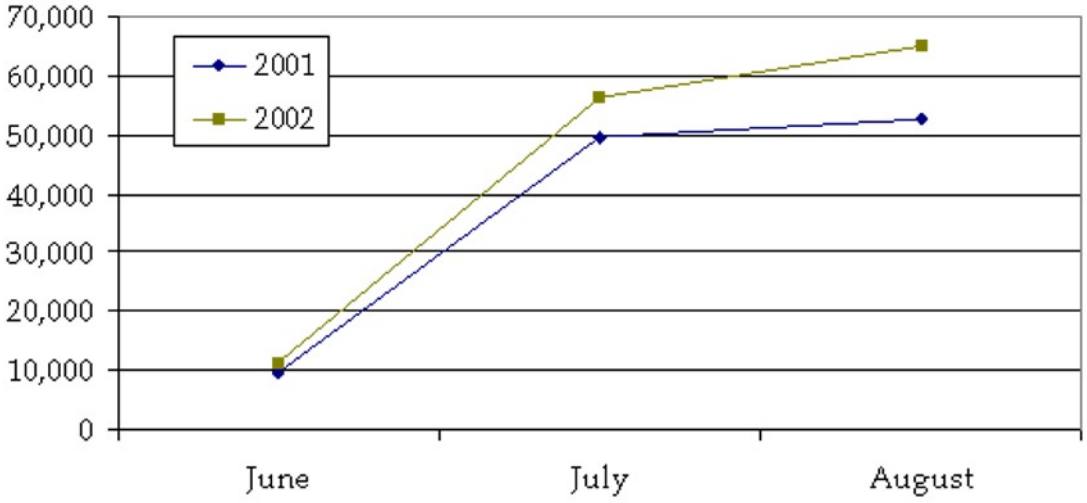


Figure B-24: Seasonal ridership on park routes.

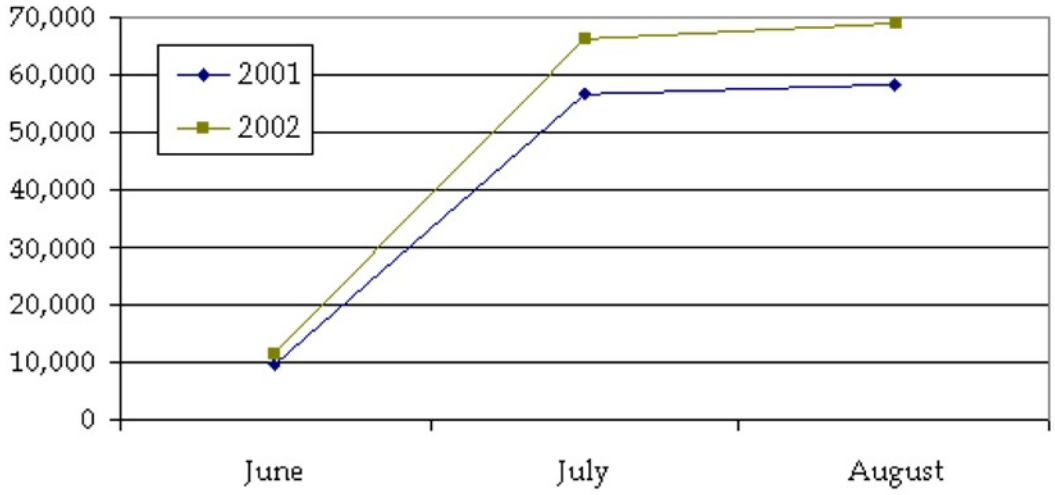


Figure B-25: Seasonal ridership on town routes.

Seasonal ridership data for the Island Explorer indicate roughly stable ridership throughout the operating season (Figure B-24 and Figure B-25). Because the service started on the 22nd of June in 2001 and 2002, June numbers would be expected to show one quarter of the riders of July and August to match the one quarter of the month of June

when service was offered. Data show that, in fact, June ridership came in at roughly one sixth the ridership of July and August. Seasonal ridership graphs show similar ridership behavior on park and town routes. In both cases, 2002 ridership surpassed 2001 ridership for all months, showing particular growth between the two years later in the season.

The time of rush hour for the Island Explorer has depended on route. Private vehicle drivers have reported encountering 88 percent of their parking problems between 10:00 a.m. and 3:00 p.m. (*116*). Heavy demand on park bus routes correspondingly occurs during the day. The volume of riders on the town routes surges around evening meal time. In particular, the campground route peaks in the late afternoon to early evening when people shop for food to take to their camps to prepare. Hotel and lodge guests prefer to eat in restaurants, so the hotel route gets busy in the evening at dinner time when people want to move between their hotels and the restaurants of downtown Bar Harbor.

B.4.5 Rider Characteristics

Acadia's rich survey data allows characterization of riders in ways that inform how different people interact with transit service. This characterization can help identify groups to target with services or marketing strategies, and it helps show how different groups affect the local area.

Park visitors taking the shuttle have arrived on Mount Desert Island by different modes of transportation. When Downeast Transportation offered the shuttle service as a campground route for a two-dollar fare, 97 percent of the bus riders had traveled to the island by recreational vehicle (*118*). The shuttle offers a particularly large degree of convenience to people who would otherwise need to drive oversize vehicles on unfamiliar congested roads. One stakeholder interviewed believes that the Island

Explorer attracts tourists in recreational vehicles away from other tourism destinations that do not provide alternative transportation. Another interviewee noted that high season for recreational vehicle tourism comes in the autumn, so extension of service into the fall shoulder season should substantially reduce local recreational vehicle traffic on local roads at that time of the year.

Ridership survey data have demonstrated that people consider the shuttle an attractive transportation alternative even to maneuverable passenger cars. In the first two years of expanded service, roughly half of the riders had traveled to the island in a passenger car without a trailer. In the third and fourth years, the share of people who had left their private vehicles in favor of the Island Explorer shuttle rose to 56 and 57 percent of responding riders (Table B-5). These people can be considered purely choice riders. They have easy access to convenient private transportation, yet they prefer to ride the shuttle. Their growing presence on the shuttle indicates that people are increasingly choosing the shuttle in favor of their private vehicles.

Table B-5: Mode of Travel to the Area (*124*)

	1999	2000	2001	2002
Car without trailer	51%	48%	56%	57%
RV or car with trailer	27%	27%	26%	20%
Ferry or bus	8%	11%	6%	8%
Commercial airplane	9%	8%	7%	9%
Sailboat	4%	5%	5%	5%
Walking or bicycle	1%	2%	0%	0%

The average group size riding the shuttle has varied between 2.5 and 3.0 with no definable trend of increasing or decreasing, but the median group size has consistently

registered at 2.0 people per group riding the bus. These numbers correspond to typical national averages for group sizes, where visitor group sizes range around 3.0 plus or minus a few tenths, though these national averages typically derive from groups traveling in private vehicles (*124*).

Table B-6: Ages of Riders (*124*)

	1993	1997	1999	2000	2001	2002
Children under 18	18%	32%	24%	24%	35%	27%
Other adults	49%	45%	61%	53%	53%	60%
Retired adults	32%	22%	15%	23%	12%	13%
Total	100%	100%	100%	100%	100%	100%

Adults of working age have consistently comprised the majority of riders on the shuttle since its expansion in 1999. In the first two years, it proportionately served more retired adults than it has in subsequent years, but in the latter years, children have increasingly discovered how the shuttle can provide them mobility across the distances of the island (Table B-6). In 2000 and 2001, children, who make up between a quarter and a third of total riders, traveled without an accompanying adult in five percent of all groups responding to the ridership survey; youth groups grew to eight percent of all groups in 2002 (*124*).

Even increases in youth group ridership could have a positive effect on local employment. Young people are finding independent mobility with the shuttle. Some young people might take jobs before they have reached legal driving age, so the shuttle enables them to join the workforce. For parents in the workforce, new mobility for non-drivers might reduce work time spent driving children to the dentist or a soccer practice.

The data show that ridership in the local population is growing. Ridership doubled between 1999 and 2002 (Figure B-22), yet summer and year-round residents of Mount Desert Island have maintained their proportionate presence on the buses (Table B-7). Given the small year-round population of the island at 10,917 (Table B-3), compared to the 2.8 million visitors to Acadia National Park, island residents must be riding the bus much more each year to hold their proportional presence. Increases in resident use might reflect rising familiarity with the service, particularly because no major service expansion has occurred since 2000.

Table B-7: Year-round Residence of Riders (*124*)

	1999	2000	2001	2002
Mount Desert Island	8%	11%	10%	12%
Other Maine	7%	5%	5%	8%
Other New England	23%	18%	19%	18%
Other out of state	54%	55%	57%	54%
Canada	3%	4%	2%	1%
Other international	5%	7%	6%	6%
Summer island residents	8%	11%	12%	9%

Locals see the shuttle as a particular convenience to international visitors accustomed to riding transit at home, but ridership data do not reflect an increase in the share of international riders (Table B-7). The decrease in international visitation resulting from the War against Terror probably affects the numbers. Locals perceive international visitors spend more money per capita than domestic visitors do, so if the shuttle helps attract international visitors in the future, it will benefit local businesses.

Surveys have shown that the Island Explorer's popularity is growing with choice riders and the local population. These findings suggest that locals increasingly believe in the system as an attractive transportation alternative that is safe for the young and old. This demonstrated support can be expected to manifest in recommendations for all types of visitors to ride the bus.

B.4.6 Capacity Supply versus Ridership Demand

The number of visitors to Acadia rises in the season through August (Figure B-26), which contrasts to the small ridership increase in July and August depicted in Figure B-24 and Figure B-25. Why does August ridership increase by only five to nine percent from July levels when August visitation surpasses July visitation by eleven to twelve percent? Possibly, ridership cannot comfortably increase above the July levels because it has reached the capacity ceiling of the current transit system.

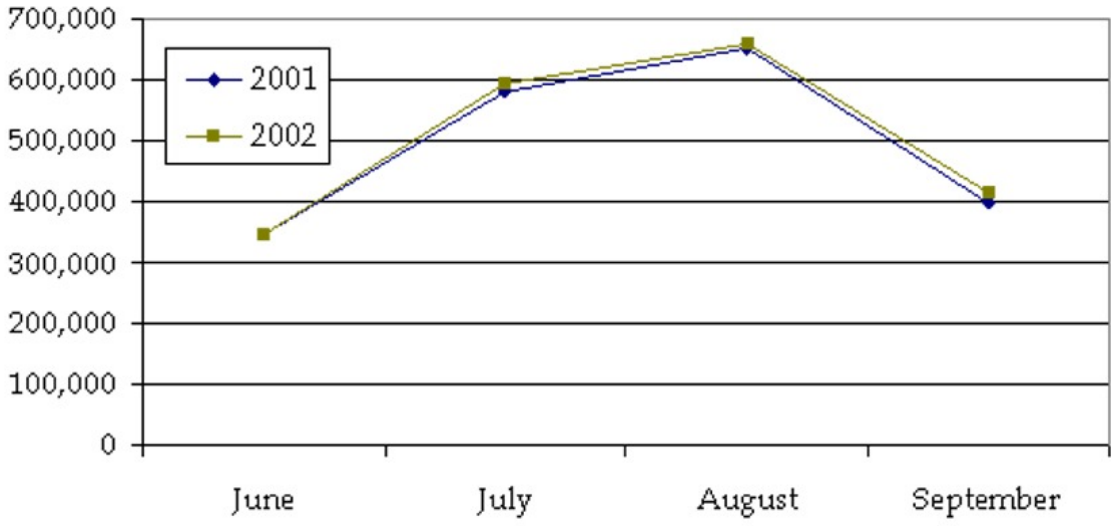


Figure B-26: Visitation through the season.

In the 2002 ridership survey, people complained about overcrowded buses. Downeast Transportation conducts the ridership surveys in mid-August every year, and in 2002, 99 percent of responding groups wanted to see more buses added to the service. Several riders reported that they had to wait for the next bus, perhaps only to find it overcrowded, as well (*124*). With bus headways of 100 minutes on some routes, riders might have to wait more than three hours if the first bus cannot fit them. Similar complaints had appeared on the 1999 ridership survey when initial ridership overwhelmed expectations and the small fleet of eight buses. The Island Explorer solved the initial problem with its fleet expansion in 2000, and further fleet expansion is planned in 2004 and 2005 to address the overcrowding associated with continued growth in visitor enthusiasm for the transit service.

Families likely feel the greatest inconvenience from insufficient transit capacity to meet visitor demand. As in most national parks, visitor demographics at Acadia change through the season. Conferences and weddings attract people in the spring shoulder season of May and June. With summer vacations, families bring the heavy crowds of peak season, and then touring retirees and local residents take advantage of the island after Labor Day (*138*). Bus overcrowding meets the families of August, which might face particular difficulties if their groups are large, but children are too young to allow the groups to split. What is the economic cost of frustration in visitors when buses have no room for them? If families disproportionately feel the brunt of capacity shortfalls, what impact is created? Getting answers to these questions will require targeted surveying.

The Bar Harbor Chamber of Commerce says that it is addressing crowded peak season conditions by promoting events in the shoulder seasons to level the peaks. The extension of shuttle service from Labor Day to Columbus Day can help with this promotion. Expanding the fall shoulder season has strong economic implications. For local sales taxes, July brings the biggest volume, but September brings the biggest margin, which means that the fall attracts fewer people, but those people spend more money per person. If promotion through chambers of commerce leads to greater fall visitation, and the higher numbers of visitors spend money characteristically of fall visitors, the gateway communities can expect strong economic benefit. Because recreational vehicle season peaks in the fall, an increase in fall visitors might mean an increase in visitors with recreational vehicles, who by nature appreciate and take advantage of the shuttle option for car-free travel. The Bar Harbor Chamber would like to see Acadia National Park support efforts to extend the visitor season further by plowing Park Loop Road to make the major park attractions accessible throughout the year.

Heavy demand for the Island Explorer extends beyond the limitations of seating and standing room for passengers: several people have decried limited bicycle capacity as a deterrent from using the shuttle. Although capacity for five bicycles per bus is high in the transit industry, two average-size visitor groups of three people with bicycles can easily overwhelm the system. As early as 2000, visitors traveling with bicycles expressed concern that buses would not have enough room to transport their bikes after a day of riding on the carriage roads, and this concern can deter people from choosing the shuttle instead of a private vehicle. Ridership surveys showed that between twelve and sixteen percent of respondents had private or rented bicycles on the island (*124*). Given

that telephone listings for 2002 showed that Mount Desert Island supports seven bicycle shops, including five in Bar Harbor alone, the interaction of bicyclists with the shuttle could have a significant impact on local businesses, positive or negative. The concessioner reports that demand for bicycle racks at Jordan Pond peaks in the afternoon as people converge at the commercial area after a day's ride. Reportedly, Acadia is looking into introducing a bicycle trailer. Need for such supporting equipment will likely continue to grow because local communities and Friends of Acadia are working to create paths for bicyclists and pedestrians to connect from community to community.

Another capacity issue might soon face Island operators: the maximum number of buses that the hub at the Village Green can handle without degrading visitor experience and affecting nearby businesses. Capacity for buses could limit expansion of capacity for passengers under the current hub design. Careful scheduling and monitoring of operations can mitigate this potential problem. By nature, hub operations bring efficiencies, but the most convenient and efficient operations bring many buses together in one place at one time period to allow passengers to transfer smoothly between routes, which could make locals perceive the local area is handling too many buses.

B.4.7 Parking

The parking situation on Mount Desert Island has raised concerns for many years. Acadia's 1992 general management plan cited the need to manage parking (Figure B-27) and reduce safety hazards associated with parking in heavy traffic areas, such as along the Park Loop Road (*117*). In 2002, 69 percent of visitors surveyed felt that parked cars along main roads caused a problem by creating unsafe conditions. Acadia's parking areas serve both as scenic overlooks for a quick view and as trailheads for hikes that last

many hours. The Island Explorer helps with one-way hikes, such that hiking groups do not need to park vehicles all day at both the origin and destination of their excursions.

The intelligent transportation systems field operational test now provides parking condition information that visitors find helpful. In 2002, 66 percent of survey respondents felt parking condition information helped them avoid parking problems, 57 percent felt the parking information helped them avoid traffic conditions, and 74 percent felt this advance information made it easier for them to get around the island (*116*). As information availability and transit service grow (reducing the need for parking and confusion about where to park legally), Acadia is incrementally increasing enforcement against illegal parking.



Figure B-27: At the Bubble Pond parking area, the Park has had to use drastic measures to manage traffic flow and parking.

Bar Harbor has similarly wrestled with parking problems. From 1979 to 1990, downtown Bar Harbor saw traffic and parking demand increase at rates of 1.3 to 3.7 percent per year. A parking study conducted by TY Lin International in 1990 noted that "cars spend a fair amount of time circling and/or confused, especially when looking for parking," and the cars move around frequently. The study showed an inventory of 444 public parking spaces downtown and 993 on-street parking places in downtown or within a one block radius (Figure B-28). On an average day, between 3.2 and 3.9 vehicles used each space in the three most heavily used downtown parking lots. Summer peak activity lasted from 10:00 a.m. to 9:00 p.m. with the heaviest traffic in the early evening, particularly from 4:00 to 5:00 p.m. These hours correspond to peak demand for the town routes of the shuttle. The study noted that weekends and overcast days bring noticeably more traffic activity to town. The worst traffic jams occurred at the end of the workday for Jackson Laboratory, the largest employer on Mount Desert Island. Twenty percent of downtown parallel parkers were employees, so the Town imposed two- and three-hour time limits for on-street parking (*120*). The Town of Bar Harbor now estimates that people working downtown take 60 percent or more of downtown parking, and many downtown businesses, such as the movie theater, have no parking facilities. Demand for downtown parking continues to surge above capacity particularly on overcast days when visitors prefer shopping over hiking. The Town is considering constructing a municipal parking garage.

The proposed shuttle circulating downtown Bar Harbor could mitigate the problem of downtown parking and reduce emission-producing cold starts of car engines. Local

businesses report that much of the traffic in Bar Harbor occurs because people are moving private vehicles from one parking space in town to another one in town. Circling and seeking parking spaces in congested areas can produce high anxiety in drivers. Although trips in town traverse short distances, the slopes of hills in downtown Bar Harbor challenge some of the elderly tourists visiting the area. Also, walking from one end of downtown to the other can intimidate retirees. A town loop route for the Island Explorer would improve access for mobility-challenged people and alleviate the need to drive private vehicles from one parking space to another across town.



Figure B-28: Parking in downtown Bar Harbor quickly fills to capacity.

The plan to encourage visitors to leave their vehicles parked where they stay overnight appears to work. In 2000, 94 percent of visitors did not use private vehicles to access the bus. Most people left their vehicles where they were lodging. Three percent of the respondents used Bar Harbor's public parking (*124*). Lodging businesses reported that their parking lots, which in previous seasons emptied in the morning, retain cars through the day during shuttle season, but as soon as shuttle services ceases for the season, lots empty for the day again because visitors use their private vehicles to circulate on the island (*140*).

Although activity patterns show that people riding the Island Explorer choose not to use their private vehicles to access the bus, long-range planning for the system calls for a single facility near the head of Mount Desert Island to serve as a visitor center, transportation hub, and park and ride lot (*125*). Such a facility will target a different section of the public: day-trippers and commuters who drive to the island each morning. It would likely appeal to visitors lodging on the mainland, as well as workers who live on the mainland. It might expand the ability for people to stay off-island, which potentially could hurt the businesses on the island; however, with island businesses working at capacity during the shuttle season now, businesses on the island might not experience negative consequences by serving excess visitor demand with off-island lodging. In effect, expanding accessibility for people off the island through park-and-ride service expands capacity of the island and park to serve more people, which could have a countervailing positive economic impact on island businesses.

B.4.8 Industry Sectors

Riders have shown that they contribute to the local economy. Each year, around two-thirds of the rider respondents have paid for lodging in the area. The mix between people staying at campgrounds versus motels, inns, and bed-and-breakfasts has varied with no one group consistently dominating. The proportion of people using the bus to commute to work has hovered each year between five and eight percent, even while ridership has grown, which suggests that the absolute number of people commuting on the shuttle has grown in the last four years. Consistently, about one fifth of the riders used the shuttle explicitly for the purposes of shopping and dining (Table B-8). The highest proportion of shopping trip purposes came from the campground route, and riders on the Eden Street bus serving large hotels and lodges did the highest proportion of dining (*124*).

Table B-8: Trip Purposes of Riders (*124*)

	1999	2000	2001	2002
Work	5%	7%	5%	8%
Shopping	12%	11%	12%	15%
Dining	7%	11%	7%	8%
Outdoor recreation	30%	28%	30%	30%
Sightseeing	37%	35%	37%	32%
Other	9%	8%	9%	9%

Whereas ridership data have indicated people split evenly between park and town routes, reported trip purposes show that roughly 65 percent of people each year use the shuttle for the purpose of outdoor recreation or sightseeing, which presumably involves visiting park lands (Table B-8). Traffic data indicate that commercial areas in and near Bar Harbor have received the greatest benefit in terms of traffic mitigation (Figure B-21),

but trip purpose data show that riders do consider the shuttle an important means of engaging in typical park activities (Table B-8).

Private companies offer many ways to tour Acadia, Bar Harbor, and the surrounding region. Land tours by bus or trolley depart from downtown Bar Harbor (Figure B-29). Acadia National Park permits 200 bus companies each year to enter the park on tours. Charter operators offer air tours from the nearby Bar Harbor Airport. Sea tours from the harbor take tourists between islands in the area or out for a day cruise to Nova Scotia. Bicycle, canoe, kayak, and various other forms of tour all exist as options for visitors to explore. In 1997, 52 percent of visitor groups took boat tours, and 26 percent of all visitor groups took sea kayaking tours. Four percent specifically took bus tours (*115*).



Figure B-29: Private tour bus companies and cruise lines sell tour packages for seamless accommodation from the boat to the island.

Island Explorer supporters and planners feel that the shuttle poses no competition for the tour industry. For instance, cruise ship operators sell bus tour packages to their passengers before the ships arrive in port, so many of the passengers do not know about

the Island Explorer. Also, shuttle planners see the shuttle as a different type of service because it provides transportation with no interpretation of the features of the island, whereas tour service offers the product of local knowledge and research on the area. Visitors might see the situation differently. With over a third of shuttle riders using the free service for sightseeing (Table B-8), the proportion of visitors using the bus for this purpose suggests that the shuttle does compete with private tour service. One tour operator reports the Island Explorer has had a negative impact on the bottom line of the tour bus industry, saying that many cruise ship passengers now ask for directions to the Island Explorer and that shuttle drivers do talk about the island to their passengers. Accepting the loss of customers, the tour operator supports the shuttle as a means of addressing traffic problems. Another tour operator recognizes loss of some customers, but also sees a gain in the number of people who can access the island at one time. This business owner has not yet determined what financial impact has come from gaining a smaller percentage of a larger potential customer base.

A newspaper article in 2002 suggested that cruise ship passengers were using the Island Explorer as a tour service, viewing the island and never getting off the bus. The article sparked local debate by saying the cruise ship passengers "hog the Island Explorer bus seats, ride around the island on all-day free tours and drive up costs for the public bus service." While the ship passengers "clogged up the buses," they did not spend money at local businesses (*141*). One stakeholder suggested that travel agents sent advance information about the Island Explorer to savvy travelers, who created an unexpected shock to the system. Other stakeholders felt the article sensationalized cruise ship

passenger impact. One hypothesis suggested that increased ridership on cruise ship days comes from local residents and workers displaced onto the shuttle.

To protect tour bus operators, Downeast Transportation currently offers no service to Cadillac Mountain, which is the primary destination for many tours. Although Cadillac Mountain was given as alms to commercial bus tour companies, and in fact, the propane buses of the Island Explorer cannot make it up that steep hill, many people anticipate private vehicle restrictions will first emerge on the road to Cadillac Mountain. Transit planners will likely examine ways of serving the mountaintop. In the meantime, the tour operator said that Acadia will require half of the tour bus fleet to operate with propane fuel by 2009, which will require smaller buses carrying fewer passengers in order to scale the hill. The smaller buses will double the operator's costs.

The Island Explorer has attracted supporting investment from several of the larger businesses in the area. Most notably, L.L. Bean announced a gift of one million dollars dedicated to funding the Island Explorer program through the Friends of Acadia. This philanthropy created a positive effect for both the beneficiary and the benefactor. The Island Explorer received more than a substantial financial boost; in addition, the 2002 onboard survey showed that 92 percent of responding riders reported positive or very positive effects on their opinions of L.L. Bean as a result of the gift (*124*). L.L. Bean showcased its donation in a public relations campaign to display the company's interest in protecting the environment. Millions of catalogs in spring 2003 featuring cover imagery of Acadia went to people's homes across the nation and internationally. The first page of the catalog described the Island Explorer and its environmental importance. In effect, this catalog brought national and international attention to Acadia, as well as

publicity for the Island Explorer, akin to the marketing efforts typical of recreational area visitors' bureaus. Such publicity should, in effect, raise tourist interest in Acadia, increasing revenue for gateway community businesses.

Large hotels and campgrounds that can afford to pay annual fees of $500 to $2,000 receive direct front-door service from the Island Explorer. Large lodging businesses believe in the value of the shuttle system to the point that some have willingly used private funds to provide infrastructure to improve bus stops at their locations. Benches and shelters provide amenities for their patrons (Figure B-30). One lodge and one campground have each created pullout areas for buses, which involved obtaining public permits for roadway modifications and construction (Figure B-31).



Figure B-30: At this general store at Town Hill, chairs, shelter, and shopping already suit bus stop traffic.

While the large lodging businesses both pay for and receive direct transit service, the signature New England small bed and breakfast establishments and local salt water taffy shops do not benefit as much from the existing system design. In fact, mostly large businesses and businesses on the eastern part of the island report that their customers use the shuttle system, while small businesses report lower use by customers (*138*). Given that 85 percent of businesses on Mount Desert Island have nine employees or fewer (Figure B-3), and most residents of the island work in small businesses, many of the island's native business owners and workers appear not to be reaping direct rewards from the shuttle service. Downeast Transportation estimates 90 percent of riders use fixed stops, rather than flagging for an informal stop.



Figure B-31: Some businesses have assumed expense to construct infrastructure and pullouts for bus stops at their locations.

One stakeholder commented on a difficulty inherent in tourism communities: new visitors do not know where they should stop to look at local culture. The example of Somesville recurred in multiple interviews. Located in the center of the island with tight historic road alignments for traveling around the harbor (Figure B-2), the village has no fixed shuttle stops, largely due to the narrow streets with no safe location. Interviewees reported that Somesville businesses complained that the Island Explorer bypasses the town and takes visitor dollars to the next town. One stakeholder suggested that the village should get together to make a bus stop near village businesses, and local businesses should advertise to make visitors know to request a stop there.

The issue of an entire village bypassed creates an extreme example, but pragmatically, the large area of Mount Desert Island makes it difficult to reach every business catering to Acadia tourists; furthermore, many small businesses cannot afford the annual fees for bus stops, so they receive no service. It raises the issue of equity for small businesses and a question of how well the existing route and stop design serves the needs of visitors. To reach the goal of reducing traffic congestion in the park, transit system design must comprehensively meet all mobility needs of visitors. Failing to connect to one leg of a visitor's journey will likely put that visitor in a private vehicle for the entire day, which will reduce the intended impacts of the transit system. If small businesses are missed, are visitor needs met? This question must be resolved locally because it requires a balance of financial responsibility through this funding scheme versus the equity concern of serving all businesses fairly.

Both in the 1999 University of Maine survey (*138*) and in several stakeholder interviews for this case study, businesses reported they felt no direct economic impact from the Island Explorer. The park concessioner operating businesses inside the park anticipates feeling a direct impact only if private vehicles are restricted. With many people arriving at businesses internal to the park by bicycle, hiking trail, or tour bus, the concessioner already has its retail operations structured for a large amount of shipping, so shuttle riders arriving without a car trunk fit within characteristics of typical customers. The prevailing sentiment in stakeholder interviews also held that traffic levels had not improved with the operation of the shuttle. Several people said that with traffic at the same level, the shuttle has merely increased the capacity of the town. Traffic data support this hypothesis (Figure B-21); however, the overall reasoning does not follow a logical progression. If traffic levels remain steady while the shuttle brings more people to town, then unless spending patterns have drastically changed, the increase of visitors in town must also increase revenue for town businesses; furthermore, local chambers of commerce have found they can use the Island Explorer as a selling point to convince people to visit the area, which suggests the Island Explorer increases the potential customer base for local businesses.

The data do potentially corroborate the assertion that shuttles do not improve business revenue in one important regard: business capacity. The businesses of Mount Desert Island largely report they operate at full capacity in the summer season of July and August when the Island Explorer has traditionally run. If the businesses already operate at capacity, the benefit of Island Explorer service cannot attract new customers. It can only help businesses in the peak season if they raise their rates, which could be seen as a

disbenefit to visitors, or if businesses can find a way to increase their capacity to serve more customers. During the spring and fall shoulder seasons in June, September, and October, businesses operate at about 75 percent of capacity (*138*). With the 2003 extension of shuttle service into the shoulder season, businesses have opportunity to start evaluating if Island Explorer service attracts customers to businesses with direct service.

Although businesses have not felt the Island Explorer has increased their bottom line, they identified several qualitative benefits of the shuttle system for their customers. Overall, businesses on Mount Desert Island support the Island Explorer. The University of Maine study showed that business owners agreed that Mount Desert Island had too much traffic, which leads to too much pollution, problems getting onto the island, and difficulties for employee commuting. With the Island Explorer, customers no longer needed to look for parking, and they could have drinks over dinner without worrying about drinking and driving. The environmental benefit of propane buses and fewer cars meant an improved quality of life for both visitors and business employees. Businesses hope the shuttle will bring more car-free visitors on the island (*138*). One stakeholder acknowledged that if visitors like the shuttle service and feel they had an easy time traveling about Mount Desert Island, they might return for another visit in the future.

Planners of Acadia's intelligent transportation systems (ITS) hope that the technology will bring economic benefit to the area. Certainly, if Acadia gains a reputation for straight-forward transportation, accessibility, and mobility, the region could attract more visitors. The 2002 survey of visitors found that visitors who used the Island Explorer and ITS stayed on the island longer than other visitors. Over half of the people who used the shuttle and ITS stayed five or more days, whereas 56.5 percent of other visitors stayed on

the island four days or fewer. These data could suggest that shuttle and technology users find the area so convenient that they stay for extended visits. Alternatively, people who have planned extended visits might be more likely to try the shuttle and technology because they have the leisure to experiment (*116*).

Presentation of the system to the public has generated public debate. When the Maine Department of Transportation designed a campaign to publicize its 511 tourism information network, part of the campaign involved showcasing the ITS implemented in and around Acadia National Park. The Bar Harbor Chamber of Commerce publicly objected in fear that discussing technology alerting visitors about full parking lots might scare potential visitors by giving a negative message about traffic congestion on Mount Desert Island. The Chamber perceived that a negative economic impact on the tourism community would result from the media portrayal of transportation technology intended to alleviate traffic congestion and improve visitor experience.

B.4.9 Long Term Costs

Acadia National Park, the nonprofit Friends of Acadia, and other supporting partners have focused on the need to provide a funding stream to support the continued operations of the Island Explorer. Corporations have made major donations, and local communities have voted to support the shuttle system with local tax money. Local tax bases contributing to the shuttle both provide financial backing and show that local residents and businesses support the system.

Planning partners secured start-up capital to begin operations with state-of-the-art equipment. Funds from the Congestion Mitigation and Air Quality (CMAQ) grant purchased the first eight propane buses, and a grant from the Federal Highway

Administration's Alternative Transportation program provided funding for the fleet expansion in 2000. The U.S. Department of Transportation further designated the Island Explorer for the field operational test of the advanced traveler information system technology, which provided $2 million for intelligent transportation systems technology (*126*). The Island Explorer still needs capital for a maintenance facility, overwinter storage facility, buses for service expansion, and replacement buses at the end of the life of the existing fleet. The planned visitor center/intermodal transportation hub/day-use parking area will need both planning and capital funds (*125*). The Federal Transit Administration through the State of Maine and the National Park Service are providing funding for new buses in 2004 and 2005.

From the start of planning, partners knew they would need to find creative ways to sustain funding for operations. Early operations funding came from the CMAQ grant, the National Park Service fee demonstration program, municipal appropriations, fees for front-door service, philanthropy, and passenger donations (*125*). The CMAQ grant expired in 2002, and Friends of Acadia had planned from the start to discontinue providing operations funds because its funding was intended as seed money (*125*). In 2002, the Island Explorer system cost $573,000 to operate. Local communities contributed $58,000 (Table B-9). Acadia National Park entrance fees covered $306,000 (Acadia's business plan says that transportation systems operations make up 22 percent of facility operations expenditures (*142*)). The one million dollar gift from L.L. Bean is to be paid over four years. It has allowed the extension of the service season to Columbus Day, and it provides significant credit for matching federal funds.

Table B-9: Local Contributions to Operating Costs in 2002 (*131*)

Town	Contribution
Bar Harbor	$30,000
Mount Desert	$14,000
Southwest Harbor	$10,000
Tremont	$ 3,000
Trenton	$ 1,000
Total	**$58,000**

Acadia National Park recognizes that it falls short in an important area of revenue collection: user fees. Several stakeholders noted this problem, and one indicated that park management needed to make sure that park visitor center staff let visitors know that they must buy passes. With an island covered with roads weaving between the park and several towns, park lands sometimes become indistinguishable from local communities. One entrance gate sits on Park Loop Road on the east side of Mount Desert Island. In other parts of the park, visitors pay park entrance fees on the honor system. Few do. Park administration recognizes its weakest fare collection occurs with repeat visitors who know how to use the park and who use the less-known areas of the park. The 1998 visitor use survey showed only 55 percent of visitor groups paid a typical Acadia entrance fee that allowed seven days of access to the park. While twenty percent of visitors groups legitimately presented a national pass to waive local entrance fees, such as the Golden Eagle national access pass, a full 22 percent of visitor groups admitted they did not pay any fees at all. In the same survey, 87 percent of visitor groups felt an entrance fee should be charged. Many local residents perceive that Park Loop Road is a toll road because it has a staffed entrance station, but all other parts of the park are perceived free (*115*). To prevent intimidating people away from using the Island

Explorer, no one checks bus riders for park passes, thus the Island Explorer provides a means for people to get around the one entry fee checkpoint on the Park Loop Road, although bus route maps state that bus passengers should purchase park passes (*125*).

Park administration is scrutinizing its own fee structure. Under the current system, visitors pay a ten-dollar entry fee for seven days of access for as many people as they can fit in one car. The pass goes to the car, but with the campaign to encourage car-free travel in the park, Acadia's administration feels the pass needs to go to the individual. Congress will need to approve such a change. The current Park Service campground fee structure presents another challenge. Paying one fee, many camping groups take two or three cars to the campsite to allow individuals to go to different attractions. The Island Explorer is already helping this situation by providing campers a new means of individual mobility.

In 2004, Acadia started attaching a ten-dollar transportation fee to its basic ten-dollar seven-day visitor's entrance fee for a total fee of $20 for seven days (*131*). For consistency with other parks charging transportation fees, the cost of an annual pass for Acadia rose from $20 to $40. This transportation fee follows the example of other national parks with new shuttle systems. Under legislative precedent established for Bryce Canyon and Zion National Parks (public law 102.03), a park can keep 100 percent of a transportation fee to pay for public transportation. In contrast, parks keep only 80 percent of entrance fees; the remaining 20 percent goes to the National Park Service office in Washington, D.C. The transportation fee will allow Acadia to keep $18 for every $20 paid by visitors, which will provide an estimated one million dollars annually for shuttle operations.

Acadia National Park has benefited from the National Parks Pass. This benefit relates to Acadia's characteristic as a destination park with few other national parks nearby. The entrance gates see few national passes purchased at other parks, so visitors still buy passes designated specifically for Acadia National Park. In addition, Acadia receives a share of the national revenue generated through the National Parks Pass program.

System riders do not appear to have a realistic expectation of the costs and financing necessary for a transit system like the Island Explorer. Over 90 percent of them consider free service important, and in 2001, 95 percent agreed that park entrance fees should contribute to covering the cost of the service. On the other hand, only 42 percent of the riders said they had paid a park entrance fee, and 60 percent of the people who had not purchased passes themselves strongly agreed the passes should pay for the service. The 2001 ridership survey showed that the people who should best know and care about paying park fees contribute the least: only fifteen percent of year-round island residents had purchased park entry permits, compared with 38 percent of summer residents and 45 percent of out-of-town visitors. In 2002, those numbers rose to 25 percent of year-round residents, 56 percent of out-of-town visitors, and a stable 38 percent of summer residents holding passes (*124*). Where do they think the money will originate if they never contribute money toward the system? For local residents, some perspectives cloud the concrete question of how to pay park fees. Should people who commute to work on park roads pay an annual visitor fee? Reaching back in history, some residents still resent that Rockefeller donated the park lands to the federal government, so they want to make no contribution to the situation. Some people discuss the idea that locals should not have to pay park entrance fees.

Though the system remains fare-free, system planners have taken steps toward encouraging riders to contribute financially to the system. Donation boxes on the buses give people the option to make a contribution while they are thinking about the benefit they are deriving from the service. The donation boxes satisfied a request from riders for a means of making voluntary contribution to the system.

Park administration and other local leaders are working to address low park fee collection by making the sale of passes as accessible as possible through increasing the number of sales locations. Local chambers of commerce are looking for ways to work with the federal fee collection system to allow chambers to sell park permits on their web sites and in their local offices. Preferably, each local community will have a sales location for park passes, and the trend is going toward selling park passes throughout Maine. L.L. Bean sells National Park Passes and park passes for Acadia on consignment, which adheres to federal government requirements for accountability of passes. When L.L. Bean sells a National Park Pass, 70 percent of the revenue goes to Acadia.

In 2001, the new bus depot on the Bar Harbor Village Green started providing a convenient venue for visitors to purchase a park entry pass at the hub of transit operations (Figure B-32). Along with Downeast Transportation management and dispatch, the National Park Service staffs the depot to answer questions and sell park passes (*125*). In the 2001 ridership survey, 21 percent of people carrying park entry passes had purchased permits at the Village Green, and people carrying passes increased to 42 percent of survey respondents, which represented a five-point increase over the 37 percent of respondents who had purchased passes in 2001. In 2002, recorded announcements on the

Island Explorer reminded riders to purchase their park passes at the Village Green, and 32 percent of riders who had passes had purchased them there (*124*).



Figure B-32: The Island Explorer bus depot on the Village Green in Bar Harbor combines park pass sales and transit operations.

While local communities see the need to contribute to the shuttle system, they are struggling with their own issues of revenue generation. In October 2002, the Alternative Revenue Task Force for the Bar Harbor Town Council submitted a final report to find sources of revenue alternative to property taxes (Table B-10). State Senator Jill M. Goldthwait stated the impetus for this charge, "By population, on any given day in August, Bar Harbor is the second largest city in the state. Our administrative resources are far fewer than in the biggest one, the city of Portland." The Task Force's final report

directly addressed needs of the tourism population for parking and transportation options. Analysis predicted the Town could realize $619,472 in annual revenue from parking fees imposed on town lots. An expansion of the Island Explorer or a supplementary free park-and-ride shuttle system figured in the final recommendations.

Table B-10: Alternative Revenue Sources for the Town of Bar Harbor (*143*)

Area of Investigation	Specific Proposal
Local Level	
Parking and transportation fees	• Parking fees for town lots but no meters for on-street parking • Free park and ride shuttle • Tour bus fee examination • Cruise ship port fee annual re-examination
Payment in lieu of taxes	• PiLOT for tax-exempt property less than a full tax value
Grants	• Investigate grant sources
County assessment	• Nominate an elected official to serve on the county budget advisory committee
State Level	
Enhanced tax revenues	• Non-optional local one-cent sales tax returning 75% to the point of origin and 25% to the county of origin
State costs to towns	• Nomination of a town council member to the Maine Municipal Association Legislative Policy Committee
Federal Level	
Special education	• Support for the federal delegation for increased funding for special education
Payment in lieu of taxes	• Support for federal legislation to increase PiLOTs paid for Acadia National Park

B.5 Recommendations for Mount Desert and Acadia National Park

Partners planning the Island Explorer have taken careful steps to cultivate partnerships through stakeholder communication and to review system performance through surveys and local communication. These efforts have resulted in a system so successful that planners now wrestle with questions of how to accommodate excess demand. Recommendations for this system aim to help Island Explorer planners make incremental improvements to a flourishing foundation.

The Island Explorer has a natural opportunity that shuttle systems for other rural parks lack: visitors do not need private vehicles to get to the area. Cruise ships and the Bar Harbor – Hancock County airport bring people to the area without private vehicles. Transit planners, the National Park Service, and local communities should make shuttle service so attractive and convenient, that boat and airplane passengers will have no desire to rent private vehicles.



Figure B-33: The transit stop at the visitor center (left) offers shelter, a place to sit, a telephone, and real-time bus information, whereas at Blackwoods Campground (right), riders wait on a narrow sidewalk flanked by parking at the entrance to an outhouse.

- **Invest in infrastructure.** Perhaps as the most obvious way to provide for the comfort of visitors, the Island Explorer shuttle system needs infrastructure. Infrastructure serves many different purposes. It physically comforts people with sore feet and allows the elderly (or simply the tired) a chance to rest while waiting for the bus. Modern infrastructure designs consider wheelchair accessibility under the Americans with Disabilities Act. If the infrastructure design includes a telephone, it provides emergency communication. As an intangible but highly important benefit, infrastructure provides tasteful visibility for the shuttle system in the park and in communities. The visibility makes visitors aware of the system, instills confidence that the bus will take people where they want if they see infrastructure everywhere they go, and reminds people searching for parking that they could consider another alternative on their next trip. Acadia National Park has developed a design concept for bus shelters and installed them at a small number of locations (Figure B-33), but many locations still have no more infrastructure than a small identifying sign (Figure B-18). Most stops in gateway communities have no notable infrastructure or attention to pedestrian design (Figure B-34). Although infrastructure on federal land in the park and municipal right of way in the towns must go through separate procurement processes, local communities should work with park infrastructure designers to achieve a consistent design and amenity at all stops in the Island Explorer system. Visitors do not (and should not) recognize the difference in agencies influencing different stops. Public workshops on stops for the park have been held, but apparently, towns have not been partners. For the Bar Harbor Village Green, residents

wanted minimalist infrastructure, leaving the traditional gazebo as the most prominent structure. The Town would not have agreed to a structure akin to the shelter constructed at Acadia's visitor center. For smaller stops on town routes, each motel and campground has done its own stop design. The design efforts need to grow and manifest into coordinated consistent physical infrastructure.



Figure B-34: A stop in Northeast Harbor shows little attention to pedestrian design & needs.



Figure B-35: The only stop in downtown Bar Harbor sits next to the fire house.

- **Work with local communities and seek professional expertise to develop land use and "urban" design**. Design of popular and successful transit service extends beyond route markings on a map, beyond scheduling, and beyond stop design. Communities need to integrate with the transit service as much as the transit service needs to integrate in communities. Island Explorer planners have taken a large step toward making this integration happen through establishing local partners. Now, the local partners need to work on their own end to blend public transportation into the fiber of the communities. The National Park Service can contribute expertise from its large reservoir of talent in landscape architecture. Design concepts should also include urban design expertise, which considers the function of places and how people use and move around in an area. Currently, a dinner and movie house sits opposite the downtown bus hub in Bar

Harbor (Figure B-16), and a fire house stands on the opposite corner (Figure B-35). The adopted location handles crowds well, but it does not encourage tourists to visit local businesses. If an ice cream or coffee shop were on the corner… or an apple cider cart, it would likely receive enthusiastic business from people waiting for the bus. Any type of impulse commercial item works well in close proximity to bus stops, but planned activities with fixed times (movie houses) and public services (fire fighting) cannot take advantage of the day-long spontaneous crowds generated at downtown nodes. Local government land use policies, modified minimum parking requirements, and strategic planning exercised in cooperation with chambers of commerce can bring urban design theory to practice if local government planners and chambers of commerce representatives work together with urban design professionals. Southwest Harbor is currently designing its Village Green, and plans do not prominently feature accommodation for the bus (Figure B-36). This gateway community has a real and immediate opportunity to make an appealingly signature land use pattern to help transit riders flow through the town and enjoy their experience there. One stakeholder suggested the alternative view that although transit at the village green makes sense, tranquility at the village green also makes sense. Whatever local consensus decides for that particular location, throughout the reach of the Island Explorer route system, local communities should plan ways to develop island land use and facilities into downtown nodes.

- **Work with the local community in Bar Harbor to develop a town loop to serve small businesses.** Service planners say the community needs to put forth

money to get the service going, but people living in the hills do not want to contribute money to solve a downtown parking problem. No mechanism currently exists for collecting money from downtown businesses to share the cost of stops as a modification of the fee-for-dedicated-stop system on the campground and hotel routes where sparsely located large businesses have enough customers to justify paying for an individual stop. A large part of the funding for downtown service should come from local or state sources, but the National Park Service also has a strong interest in seeing it develop. Until the small businesses in the town are served, the Park will fall short of its goals for air quality, visitor



experience, and traffic congestion management. Short

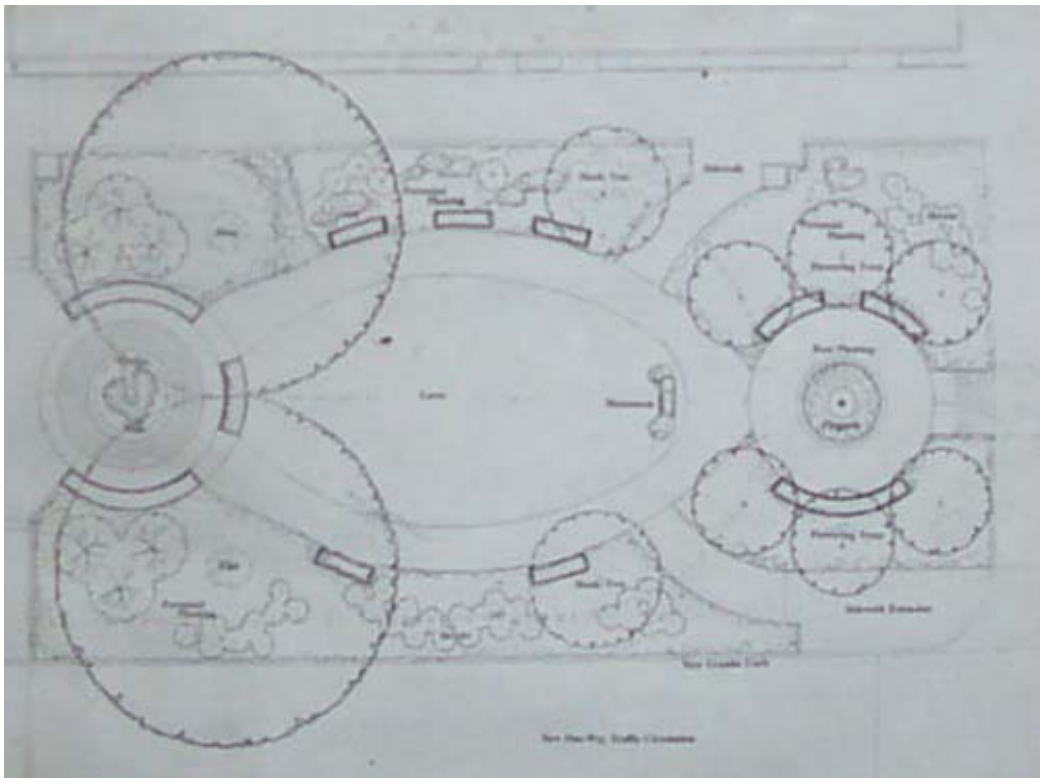


Figure B-36: The Southwest Harbor Village Green design plan does not incorporate a bus stop as a key element.

trips across town and the associated starting and re-starting of engines are major contributors to local mobile source emissions that pollute the air shared in the town and the park. Furthermore, the experience visitors remember from vacations is the total experience of both the park and the gateway community, so problems finding parking in town mar the overall visitor experience. Finally and perhaps most importantly, if visitors depend on private vehicles in town, then they are likely to use those vehicles in the park, as well. It is in Acadia's best interest to provide seamless transportation for all visitor needs.

- **Develop express service to serve local employment centers.** Express service will attract more employees to use the shuttle by reducing travel time. With more employees on the shuttle, fewer employee cars will take parking spaces that serve the tourism population. Particularly in retail and restaurant areas, increased

accessibility for customers to reach businesses can mean increased revenue for those businesses.

- **Make long-range plans for maintaining current systems and increasing service capacity.** Demand for the Island Explorer has increased every year, and all indications suggest that this trend will continue. The service has expanded beyond Mount Desert Island to Schoodic Peninsula, riders are calling for more service on existing routes, and new routes figure into logical long-range plans. The partners of the system need to design long-range plans for expansion of the fleet and operations, as well as systematic replacement of rolling stock and infrastructure maintenance. As partners in the system plan for continued growth, the consensus building process must also address concerns that the system is growing too large for local communities to supply a local funding match for federal grants. The strategies developed by Bar Harbor's alternative revenue generation task force provide the basis for ideas to tap into the resource of the tourist population, rather than the local population, to pay for this service designed primarily to address the problems associated with the traffic congestions of tourism crowds.
- **Address the specific concern of bicycle capacity.** Island Explorer survey results have shown some consistent areas of concern. Although some might be difficult to address, such as demand overwhelming service supply for the highest peak period, other areas might have simple solutions. Bicycle capacity, for instance, need not necessarily deter large groups of bicyclists from using the shuttle. The Island Explorer might consider equipping one vehicle with a high-capacity

bicycle trailer and advertising times of day when that trailer will circulate popular bicycling spots.

- **Expand transit service to capture traffic to and from the airport in Bangor.** Downeast Transportation has long-range plans to extend service to Bangor International Airport (BGR). This airport connection will open car-free access to the park to the largest portion of visitors who access the park by air. In the interim before this link enters Island Explorer operations, Downeast Transportation should explore coordinating with Greyhound for bus connections. Friends of Acadia, local chambers of commerce, and state offices of transportation and tourism can then develop strategies to market of seamless transportation without a private vehicle from Bangor and the Bangor airport to Mount Desert Island.
- **Advertise at the airports.** Visibility at airports is perhaps even more important than visibility at other transit stops. Rental car companies advertise at airports for a reason (Figure B-14). When people arrive at an airport, they often make decisions on the spot for how they will reach their lodging. People need to fathom from the moment they step off a plane that the Island Explorer will take them to where they stay and that it will also take them everywhere they want to go. Shuttle advertisement at the airport must command at least as large a presence as a rental car advertisement. That advertisement must inspire confidence that visitors do not need to rent a car to get where they want to go.
- **Improve public information to visitors for pre-trip planning.** Several interviewees commented on a general lack of communication to the public. One stakeholder commented, “The Park is not good on little details like telling people

when buses are not running anymore. You see people standing there [at the bus stop] that first day after Labor Day. You feel bad for them." Downeast Transportation also reported that it gets calls from visitors who need to change the way they had planned to travel the island before and after the operating season because they had expected to use the Island Explorer. The public needs more information, and this need will expand as the service expands. The extension of service into the shoulder season means the Island Explorer must run on two different schedules, dependent on the service levels merited by visitation levels and ridership demand at a given time of year. Multiplicity of schedules adds a layer of confusion for riders trying to interpret the system. Planners can look to the 1997 visitor use study for ideas on how best to reach visitors. The study found that prior to arriving at the park, 41 percent of visitor groups got information from travel guides and tour books. Twenty percent referred to the Acadia National Park web page (http://www.nps.gov/acad), and thirteen percent looked at other web pages about the area or area businesses. Most likely, web use has grown in subsequent years with general expansion of use of the Internet. Once on site, 51 percent of visitor groups found information in local tourist publications, and eleven percent took information from local chambers of commerce (*115*). By 2001, the ridership survey for the Island Explorer asked if people had seen the Island Explorer web site and found that only five percent of non-resident riders and fifteen percent of residents had seen the site. These figures contrasted a 1999 survey that showed that 49 percent of Acadia National Park visitors had used the Internet to plan their trips to the region. The difference might indicate that the

Island Explorer web site did not have a prominent enough presence on sites used to plan trips to Acadia. The 2001 ridership survey also showed that one quarter (24 percent) of the year-round residents riding the bus had ridden the bus for the first time that year. Again in 2002, 23 percent of year-round residents were riding for the first time. Resident use of the service is growing as people become more familiar with the system. Information and communication for the general public will allow this trend to continue (11).

- **Improve public information targeted to the local area.** Interviews for this study and the results of other studies have revealed a lack of understanding and communication for how to work with the general public to make people in the local area understand the shuttle system. One stakeholder pointed out that Acadia has no full time public relations person, and perhaps the need now exists. Another interviewee emphasized the need for forthright communication and education about park fees and their relation to keeping the shuttle free. From the start, marketing the shuttle service has involved presence on web sites for Acadia National Park, Friends of Acadia, and the Island Explorer's site (http://www.exploreacadia.com). Planning partners attend town meetings to keep local leaders informed of plans, and Acadia personnel serve on local committees. Acadia publishes the bus schedule in the summer edition of the park newsletter, *Beaver Log*, and many local businesses and government offices distribute schedules (*12*). The Bar Harbor Chamber of Commerce also puts shuttle information in the 280,000 guidebooks it produces and distributes each year. As early as 2000, most businesses received daily questions about the Island Explorer.

Even at businesses distributing schedules, people working at private businesses felt they knew too little about the system to provide personal information or perspective. Customers with advance knowledge of the system usually had seen the Island Explorer in a previous year or had found information on lodge web sites, but most customers had no foreknowledge of the transportation alternative. Businesses also felt they were doing all the advertising for the system. Representative businesses said they would like to see the Island Explorer planning committee do more publicizing (*138*). Meanwhile, the Island Explorer planners designed different plans. With demand regularly reaching or exceeding capacity, marketing efforts for the Island Explorer were purposely limited (*125*). Although objectives of different stakeholders might contradict each other, such discrepancies should stand in public light and open communication, so the stakeholders can reach consensus, or at least understanding, on what happens in the present and how to address different stakeholder needs through strategic planning. If left unspoken, these discrepancies can fester and instigate ill will. Partners planning the Island Explorer system need to devise a way to expand communication throughout the local community. Chambers of commerce, local governments, and even the Island Explorer web site can all provide mechanisms for communicating shuttle strategies beyond the planning partners to the local public affected by the system.

- **Help local businesses understand the value to customers and the economic opportunities of intelligent transportation systems.** Business owners need to understand how the intelligent transportation systems real-time information will

benefit tourists and the overall flow of transportation in the area. During site visit interviews for this study, people without intimate involvement with the design and implementation of the intelligent transportation systems overwhelmingly saw it as a humorous experiment without particular value. Respondents to the preliminary University of Maine survey for intelligent transportation systems found skepticism that business customers would use the system, so businesses did not consider disseminating information about the system a high priority (*55*). In contrast, the 2002 survey of visitors showed that the public found the system useful (*116*). Education of business owners would help businesses develop strategies to help visitors use the technology to improve their experience in the area. One stakeholder interviewed particularly emphasized that no one is educating local businesses on the entrepreneurial opportunities that the Island Explorer and the intelligent transportation systems create. The interviewee recommended that the chambers of commerce could take an instrumental role in this local outreach.

- **Create inclusive training opportunities.** Each visitor season, the National Park Service conducts training for seasonal employees to teach them how to interact with visitors and to provide information on how to view and get around the park. In reality, visitors address such questions to people at every type of visitor establishment in the area, such as hotel reception desk clerks, waiters in restaurants, and salespeople in stores. In 1999, 34 percent of riders on the Island Explorer learned about the shuttle from hosts of their lodging facilities (*138*). The Bar Harbor Chamber of Commerce also holds introductory sessions for seasonal

workers. Downeast Transportation, Acadia National Park, and other partners need to contribute to information sessions with local businesses to explain how to communicate the system to tourists. Front line employees must have answers readily available, even if they are spending their first seasons in the area. In a study of five transit systems serving parks and gateway communities, the Friends of Acadia emphasized as its final recommendation the need to train people across the island, not just National Park Service employees, about the operations of the system and how to answer visitor questions (*125*).

- **Watch what happens economically in the fall shoulder season with the Island Explorer in service.** Chambers of commerce should keep an ear to the ground to learn what changes happen in the shoulder season with transit service in operation. Will businesses with front door service attract more customers? What happens with the small businesses of the island? With higher margins in sales tax revenue in September than in July, the fall shoulder season presents an economic opportunity, particularly if the shuttle system attracts recreational vehicle drivers from other tourism destinations because these drivers prefer car-less mobility.
- **Strengthen fee collection in the park.** Acadia needs to take its share of the financial responsibility for maintaining transit operations and other park budgetary needs. Although the shuttle is fare-free, visitors should need to show drivers that user fees have been paid on routes entering the park. Also, entrance stations should be considered for more access points. Minimally, honor system fee collection boxes should be located at all major attractions. The Park launched a public education program for the 2003 season to gain better compliance with

fees. Such efforts should continue and expand. Acadia should commission a study to analyze ways to strengthen fee collection practices without overburdening visitors and island residents. Such a study could take the form of a formal commissioned consulting report, or it could go in the low-cost direction of a term project for a group of business school students from a nearby university. In whatever form it takes, the study needs to bring fresh ideas on fee collection, and it should include central involvement from National Park Service specialists in fee collection at other parks. Part of this process should also include communicating to island residents that improved fee collection should result in less need for local contribution to partnership projects between the Park and local communities. An analysis of fee collection needs to occur as a primary step before seeking external federal funding.

As a top priority, partners in the Island Explorer should discuss ways to improve communication to visitors and the local community. The Island Explorer establishes a strong model for partnering, but partnering with agency leaders does not guarantee dissemination of information to front-line employees and the public. Front-line training, marketing to the public, education of business owners, and general visibility through infrastructure and advertising offer potential mechanisms for the Island Explorer to expand its impact on the area. The partners themselves already seem to understand the importance for them to focus on strategizing finances to sustain and expand the system.

B.6 Possible Implications for All Parks

All parks can take a lesson from the success of the partnering efforts that made the Island Explorer grow and thrive. These partnerships started with the skepticism one

might expect from communities considering major changes in how people travel locally. Several stakeholders said the buses opened their eyes, but "not until we saw them running." From that point, they started saying, "if you build it, they will come." To overcome initial skepticism, visionaries of the system need to communicate the vision, and partners must use their unique roles to further mutual goals. Acadia National Park administration generated much of the political momentum and enthusiasm needed to launch the system, and management is now coming to terms with the reality that if for a park to act as a responsible and credible partner, it must tighten fee collection before asking locals to tighten their belts. Friends of Acadia credits its position in the nonprofit sector, as opposed to the public sector, as an opportunity to push for policy initiatives favorable to promoting transit. Friends of Acadia has also taken on a role of publicly thanking participants and contributors to the Island Explorer. The nonprofit gives awards and tries to make everyone involved look good. These activities require time and management, but they can often generate important benefits and continued interest in supporting the service.

The Island Explorer illustrates how a transit system must be designed with the total visitor experience in mind. Visitors have a limited number of days and a limited amount of money with which to explore a park and enjoy a gateway community. If one leg of their planned day's journey is not served by the shuttle, then they will take a private vehicle. The survey of users of intelligent transportation systems showed that visitors value amenities that help them save travel time, even in recreational areas, and displaying real-time shuttle information helps convince people to try taking the bus. Visitors need highly visible information on shuttle offerings, routes reaching everywhere they want to

go, infrastructure to make the experience reach vacation-quality comfort, and local amenities within a few feet of transit stops to make waiting for the bus enjoyable. Whether in the park or the gateway community, a lack of any of these factors can tilt a visitor's decision to take a private vehicle, rather than the shuttle bus. In this case, park goals for transit might not be attained because of lack of attention or funding for a detail of the transit planning process. If a transit system is well-designed and comfortable, visitors will use it, even without private vehicle restrictions.

Communication to visitors needs to start from pre-trip planning, and information must greet visitors the moment they get off the plane, disembark a ship, or drive into the area. A highly visible and transparently convenient shuttle system will attract visitors to ride; however, if the shuttle does not have a large presence, people will feel uneasy suspecting that they will spend their limited vacation time learning the hard way that the shuttle does not take them where they wanted to go. To help visitors feel comfortable with the system, front-line people throughout both the park and the gateway community need to have information and training to help them answer questions.

The Acadia experience shows that although the shuttle is intended for park visitors, the local workforce and seasonal employees will use the service, as well. Transit operators should anticipate local workforce demand for service and provide express service at commute times to help keep employee cars out of spaces that visitors can use. Local chambers of commerce should coordinate with businesses and transit operators to design such service, and the chambers need to communicate the system setup to business members. Parks should embrace employee ridership because it provides indirect benefits that match transit goals. If the local workers either leave their private vehicles parked at

home or, in the best case scenario, never bring private vehicles to the area, then their vehicles never clog local streets, park roadways, and area parking facilities. Traffic capacity to serve visitors thereby increases. Additionally, safety benefits might be realized because seasonal workforces of national parks often come from two of the highest risk traffic safety demographics: young and elderly drivers. Finally, the transit service brings a tangible benefit to the local economy, as it provides opportunity for mobility-challenged sections of the population to take employment and fill job openings in the park and in local businesses.

Operationally, Downeast Transportation has several lessons to offer other transit planners who want to set up new systems. The 600 percent increase in ridership when the Island Explorer eliminated its two-dollar fare committed everyone involved with the shuttle to the idea that park and gateway community shuttles needed to remain fare-free. The first season of operations illuminated lessons in route design, such as the need to keep the shuttle system simple by having routes terminate at the hub to avoid confusion about the direction of buses on continuing routes, as well as the need to have each route appeal to more than one destination. Several stakeholder interviewees noted that passengers overwhelmingly prefer to use fixed stops, so any business without a fixed stop is hurt, despite the best intentions of the flag stop system. As a basic operational necessity, the Island Explorer experience shows that as a bare minimum, buses need to have radio technology to allow communication with the field and to control public confusion over when buses will arrive. For more sophisticated technology, intelligent transportation systems help build presence and confidence for visitors to try riding the shuttle, but an effective implementation of intelligent transportation systems requires an

effective public education and communication strategy. Once visitors use the system, the technology saves them time to spend enjoying the park and gateway communities, rather than fighting traffic or strategizing transportation in the area.

The Island Explorer initiative has demonstrated the benefit of research in helping improve operations, address public needs, and provide new ideas. Ridership surveys and the 2002 visitor survey have shown that data on bus visitors importantly inform and guide transit policy, planning, and operations. These data help clarify needs of different visitor groups and local stakeholders. As a result, all participants in the system can better address these needs.

The Island Explorer has raised an interesting question: what needs to happen if transit service succeeds beyond expectations? An embarrassment of wealth poses challenges often unconsidered. How can Acadia expand the capacity of its system now that riders have shown they need more service? Who will pay for new buses, and who will pay for operations? If Acadia fails to meet this challenge, visitors will complain to Island Explorer drivers, park staff, and local businesses. Morale problems will grow, and park transit will earn a poor reputation. Contingency planning for transit must consider problems of both low and high demand, and high demand means a need for additional funding. Although the list of means for local revenue generation created by the Alternative Revenue Task Force are tailored for Bar Harbor, many of the options under investigation can relate to other gateway communities (Table B-10). The boon of L.L. Bean's million-dollar donation, which will go a long way toward ensuring future development of the Island Explorer, demonstrated that a nonprofit park friends group, such as Friends of Acadia, can be an active force for gaining funding.

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APPENDIX C: CASE STUDY OF BRYCE CANYON NATIONAL PARK AND GARFIELD COUNTY, UTAH



Figure C-1: Bryce Canyon National Park.

C.1 Introduction

Bryce Canyon National Park contracted operations for the Bryce Canyon Shuttle to begin in 2000. The timing coincided with the launch of shuttle service at Zion National Park, from which many of Bryce Canyon's visitor come. Within the first year of

operations, the financial model for Bryce Canyon failed, and the third year of intended service brought a partial contract termination. Despite this reduction in service, visitors eagerly have taken advantage of the shuttle system and demonstrated their interest in maintaining this mode of transportation. Bryce Canyon now struggles to determine how to afford providing a necessary service. Data collection for this report took place during a site visit to Bryce Canyon from April 14th through 18th, 2003.

C.2 Background

C.2.1 Bryce Canyon National Park

Bryce Canyon National Park contains 35,833 acres (145 square kilometers) of spires from eroded sandstone, limestone, and mudstone in Utah. It sits amidst a cluster of parks in Utah, Arizona, and Nevada, including the Grand Canyon and Zion National Parks, which attract substantial numbers of visitors every year. Bryce Canyon sits in a location nearly in the middle of the major population centers of Las Vegas, Nevada and Salt Lake City, Utah at a distance requiring roughly three or four hours of driving to either metropolis (Figure C-2). The combination of unique attractions and a shared location brought Bryce Canyon 1,068,619 visitors in 2001.

Bryce Canyon sits in an exceptionally rural area. It borders national forest lands, such that all visitors must cross forest lands in order to reach the national park by road. This buffer zone sets commercial services and other gateway community offerings at a distance from the park entrance. Although a small commercial area sits directly beyond the forest lands to the north, the nearest town, Tropic, is located 11 miles (18 kilometers) to the southeast, and the nearest town with a population greater than 1,000, Panguitch, sits 24 miles (39 kilometers) to the northwest.



Figure C-2: Bryce Canyon sits amidst a cluster of national parks.



Figure C-3: Oversized vehicles cannot access the full park.

For a number of years, the National Park Service has considered the 1930s-era roads of Bryce Canyon insufficient to meet modern demand. Obsolete road geometrics motivated a park policy to restrict trailers from traveling far into the park (Figure C-3), and a 1990 road evaluation identified shortcomings in roadway structures and parking widths (*144*). The spinal road of the park is now undergoing an extensive road widening project to improve its ability to accommodate modern traffic demand (Figure C-4).



Figure C-4: Bryce Canyon National Park is widening its primary park road.

C.2.2 The Gateway Community: Tropic, Utah and Garfield County

The entrance to Bryce Canyon National Park sits in Garfield County, Utah, which has a particularly rural and small-town character. Panguitch (Figure C-5), the largest nearby town, sits a distance away from the park. Smaller than Panguitch, but closer to Bryce Canyon National Park, even the town of Tropic requires several minutes of driving east of the park entrance (Figure C-6). With between 96 and 98 percent of the 678 square miles (1,756.2 square kilometers) of Garfield County owned by public entities like the National Park Service and the U.S. Forest Service, local residents and business owners can safely expect to maintain their rural lifestyle



Figure C-5: Panguitch is the largest town in the area.



Figure C-6: The small town of Tropic sits east of the park entrance.

Table C-1: Census 2000 Community Characteristics and Change from 1990

	Tropic	Panguitch	Garfield County	Utah	United States
Population	541 +44%	1,612 +12%	4,735 +19%	2,233,169 +30%	281,421,906 +13%
Median Household Income	$42,500 +97%	$33,500 +41%	$35,180 +66%	$45,726 +55%	$41,944 +40%
Per Capita Income	$13,896 +96%	$12,439 +51%	$13,439 +63%	$18,185 +65%	$21,587 +50%
Population below Poverty	2.1% -12.8 pt	9.6% -2.3 pt	8.1% -6.6 pt	9.4% -2.0 pt	12.4% -0.7 pt
Land Area in Square Miles (Square Kilometers)	0.5 (1.3)	1.4 (3.5)	678.1 (1,756.2)	82,168.1 (212,815.5)	3,537,438.4 (9,159,116.1)

The small towns of Garfield County do not have sufficient population to afford a tax base appreciable enough to contribute substantially to the shuttle (Table C-1). The entire

county had less than 5,000 people in total population in 2000 with median household income and per capita income less than national averages by $6,794 and $8,148 respectively. Even so, the area does well at keeping people above the poverty line. Tropic, in particular, has only 2.1 percent of its population living in poverty. Overall, Census data indicate that residents of the local area have sufficient sustenance, but they live modestly.

One family holds particular presence in the economy and culture of the local area. Directly outside of Bryce Canyon National Park, one family owns a commercial district dominated by Ruby's Inn (Figure C-7). Reuben C. (Ruby) Syrett established a large ranch in the area in 1916 and established his lodge, Tourist Rest, nine years later in the current location of Ruby's Inn when Bryce Canyon became a national monument in 1923. Ruby's ranch spanned the area where the state highway now accesses the park, leaving Ruby's grandchildren and great grandchildren with prime commercial land and a mix of businesses located on land on both sides of the highway leading to the entrance to Bryce Canyon National Park (*145*).



Figure C-7: One family owns several businesses that span Bryce Canyon's entrance.

Bryce Canyon National Park has the greatest national reputation of the lands in the area, but several other public lands and attractions offer visitors scenic views and outdoor activities. Dixie National Forest's 2 million acres (8,094 square kilometers), Kodachrome Basin State Park's 4,000 acres (16 square kilometers), Grand Staircase-Escalante National Monument's 1.7 million acres (6,880square kilometers), and other parks and recreational areas all serve visitors (Figure C-8), which indicates the importance of tourism for the local economy. Even the major highway through the area has qualified as a Scenic Byway for its cultural, scenic, and environmental attributes (Figure C-9). Garfield County aims to develop the county's economy through traditional business and industry, agricultural and ranching opportunities, new industry, and tourism promotion (*146*). The Town of Tropic formed a vision of building a historical museum to promote tourism (*147*).



Figure C-8: Local attractions and communities surrounding Bryce Canyon National Park (*148*).

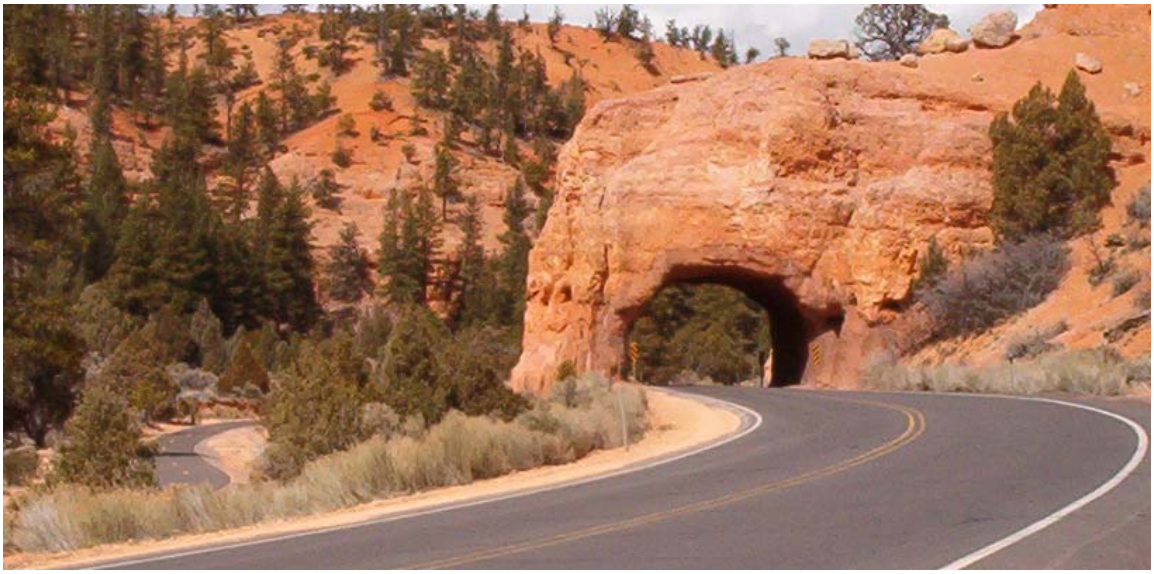


Figure C-9: Outside the national park, a scenic byway creates a unique approach to the region with arches, pullouts, and a parallel bicycle path.

Garfield County has a strong orientation to tourism, but the remote location makes access to the area difficult. The closest major airports to Bryce Canyon sit in Las Vegas and Salt Lake City. Although the Bryce Canyon Airport with its 7,400-foot (2,256-meter) runway sits close to the entrance of the park, this small general aviation airport will not likely bring large numbers of visitors to the area in the near future (Figure C-10).



Figure C-10: Bryce Canyon Airport.

In terms of surface transportation, Garfield County's mission statement states an intention to support roads, but it does not indicate intention to develop or expand transportation services (*146*). Likewise, community goals for the Town of Tropic indicate and emphasis on transportation infrastructure, rather than services. Specifically, Tropic intends "to pave all streets, including sidewalks and maintain them with good drainage and no weeds" and "to promote clean and properly landscaped roadways" (*147*). Both the town and the county adopted their current plans before the Bryce Canyon Shuttle started operations.

C.3 The Bryce Canyon Shuttle

C.3.1 Current Conditions

The Bryce Canyon Shuttle has operated a new fleet of eleven primary and four backup diesel-powered 28-seat buses (Figure C-11) at various levels of service. Lewis Brothers Stages, which has operations based in Salt Lake City, has provided the vehicles and this apparently free service as contracted operations. In 2004, the shuttle ran on two routes from 8 a.m. to 8 p.m. from Memorial Day through the end of September. Visitors to the north end of the park could catch a bus every six to ten minutes for a round-trip on the red line that lasted 60 minutes for passengers, and shuttles to the south end of the park departed on the green line six times per day (Figure C-13 and Figure C-14). The green line would take visitors south to where only a road on a narrow ridge provides access (Figure C-12).



Figure C-11: The Bryce Canyon shuttle uses a new fleet of diesel buses (*148*).



Figure C-12: The park's southernmost road crosses a narrow ridge of unstable soil.

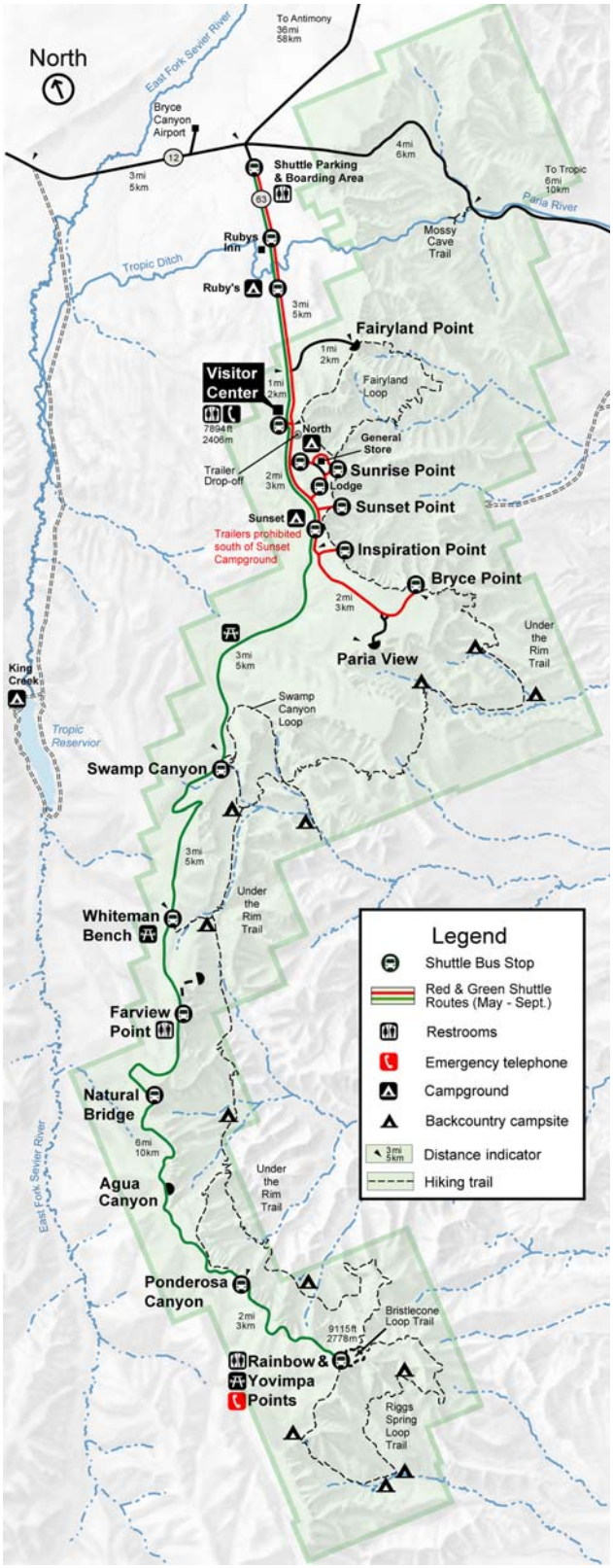


Figure C-13: Bryce Canyon Shuttle routes in the park (*149*).

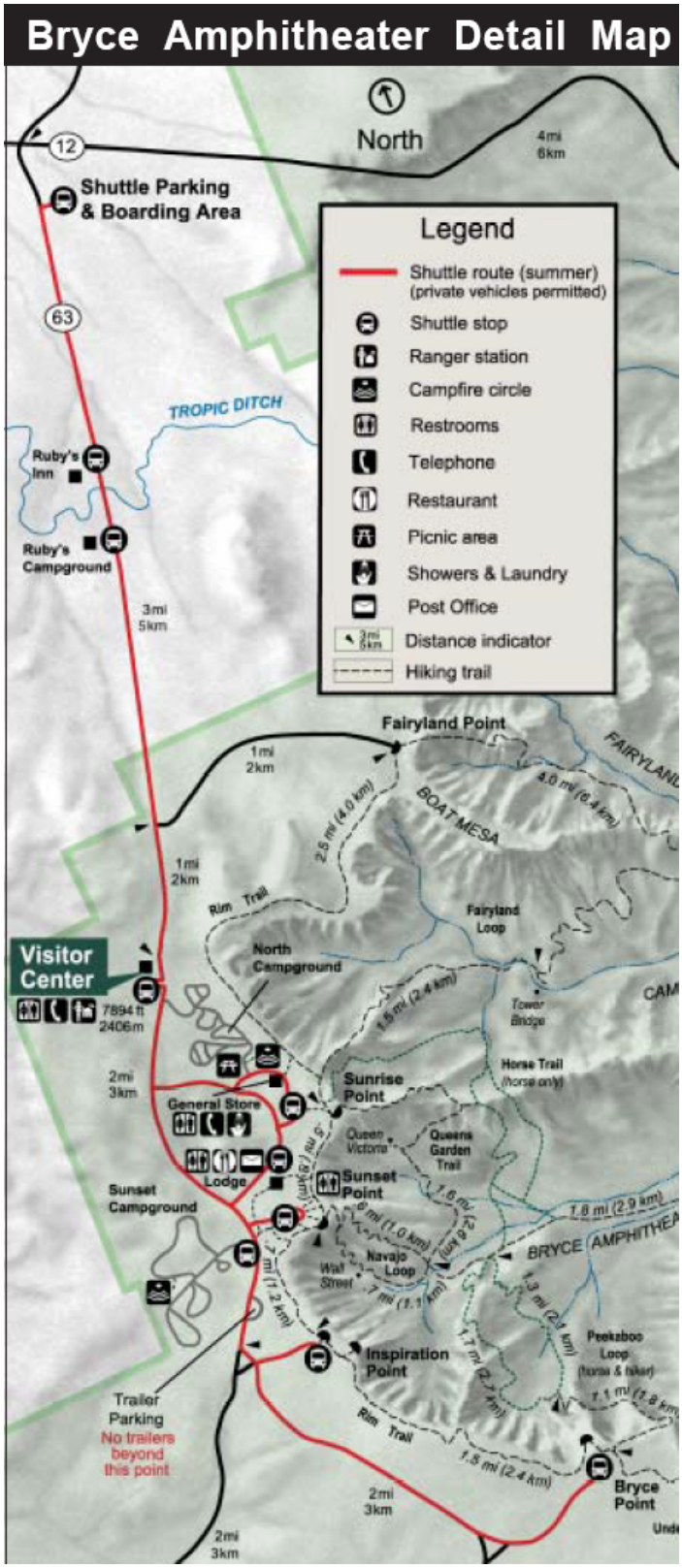


Figure C-14: Bryce Canyon Shuttle routes enlarged (*150*).

Bryce Canyon's newspaper, *Hoodoo* advertises shuttle service as a "free, easy and convenient" way for visitors to do their "part to reduce traffic, conserve fuel and protect park resources." To the visitor's eye, the $20 fee paid to enter the park through the entrance gate or $15 paid to enter from the staging area covers all bus fares. Bryce Canyon publishes route maps and schedules of all routes in *Hoodoo.*

The shuttle serves fixed stops at major locations throughout the park and beyond its border, such as red line amphitheater stops at:

- Shuttle Parking and Boarding (outside park)
- Ruby's Inn (outside park)
- Ruby's Campground (outside park)
- Bryce Canyon Visitor Center
- Sunset Campground
- Bryce Point
- Inspiration Point
- Sunset Point
- Bryce Canyon Lodge
- Sunrise Point/General Store

Visitors find benches and shelter at these fixed stops (Figure C-15). Bryce Canyon built bus shelters and benches in the most heavily visited parts of the park, leaving other areas served by the shuttle without infrastructure. The strategy proved fortuitous because when shuttle service shrank due to lack of operating money, the one remaining route had a full complement of bus shelters, and no bus shelters confused visitors by standing vacant on discontinued routes. Outside the park, Ruby's Inn has invested in road infrastructure improvements that would generally fall under public right-of-way improvements, such as reinforced highway asphalt to handle the weight of shuttle buses.



Figure C-15: Stop infrastructure exists in the park (left) and nearby commercial area (right).

The largest infrastructure associated with the Bryce Canyon Shuttle sits outside park boundaries and serves as a staging area for visitors to park and ride the bus (Figure C-17). The facility offers parking for large and small vehicles, sales of park passes, interpretation and advance information on the park, and other amenities (Figure C-16). The staging area is located north of the park at the intersection of highways 63 and 12 (Figure C-13). This location sits one half mile away from the entrance to the park. Shuttle passengers ride past the major commercial area just outside the park at Ruby's

Inn and Ruby's Campground. With transit route time and distance increased by the extra half mile, the staging area location adds operating costs to the system.

Visitors to Bryce Canyon ride the shuttle voluntarily, which contrasts with the policy in nearby Zion National Park, which implemented private vehicle restrictions in the first year of transit operations. Some visitors to Bryce Canyon National Park who arrive from Zion have inquired about implementing private vehicle restrictions at Bryce Canyon, as well, but administrators there feel the road network of Bryce Canyon does not lend itself to private vehicle restrictions in the way that Zion's network does. In Zion, the Zion-Mount Caramel Highway and other park roads allow park access to people who simply do not want to ride the shuttle, but the spinal road network of Bryce Canyon would not allow alternative access points for private vehicles if the primary area of traffic congestion falls under private vehicle restrictions.



Figure C-16: The staging area offers information, restrooms, and other amenities.

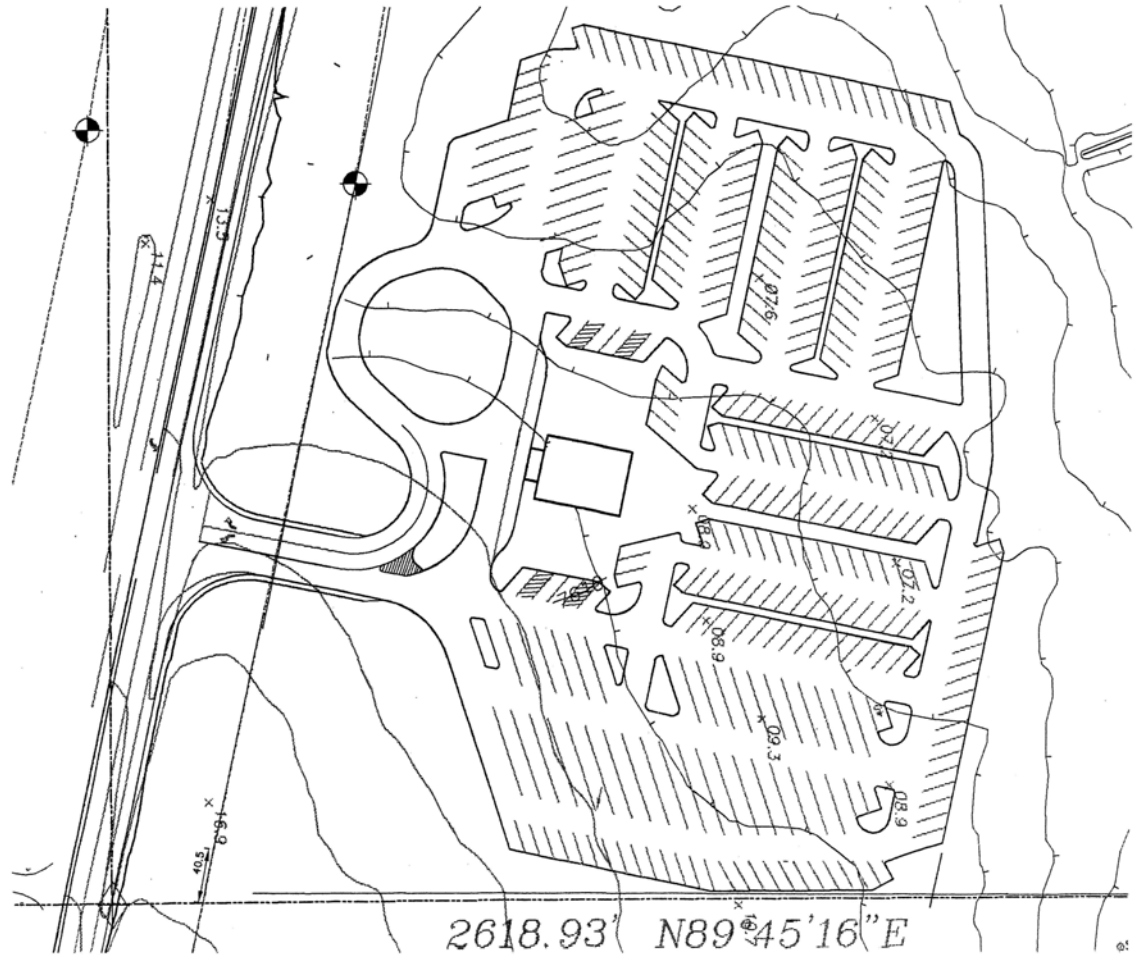




Figure C-17: Bryce Canyon's staging area offers substantial park-and-ride capacity.

C.3.2 History: Goals and Lessons

The Bryce Canyon Shuttle started service with one primary goal: to decrease parking congestion. Bryce Canyon National Park's web site describes traffic conditions of people "waiting in lines to enter parking lots, circling parking lots looking for empty spaces, or fighting traffic in congested areas." Transit system organizers estimated that getting ten percent of all visitors onto buses would attain a sufficient level of congestion reduction, and this objective appeared attainable. In 1996, years before service officially started, a local tour operator approached the park to test the concept of shuttle service. Ruby's Inn provided a parking area. The bus operator would charge nominal fares to cover costs. Bryce Canyon charged no entrance fees for shuttle riders in exchange for data on ridership and operational costs. Visitors proved themselves receptive to riding shuttles in Bryce Canyon, setting the stage for a larger implementation.

As part of the motivation for the shuttle, Bryce Canyon saw the need to have compatible services at all parks in the region. Grand Canyon National Park has had shuttles for years, and Zion National Park was getting resources for a new transit system carrying practically all visitors to Zion Canyon. Given that many of Bryce Canyon's visitors arrive directly from Zion, Bryce Canyon officials anticipated complaints when people went from a hassle-free state-of-the-practice transit experience in Zion to traffic congestion and fights for parking problems in Bryce Canyon. Bryce Canyon needed transit to come on line at in the same year (2000) as the Zion Canyon Shuttle's start, even though Zion received extensive federal resources, and Bryce Canyon had to work without external support.

Bryce Canyon National Park began a ten-year $18-million contract (technically, a five-year contract with five options to renew for one year) in 2000 for the Bryce Canyon Shuttle to operate three routes from 8 a.m. to 8 p.m. from Memorial Day through the end of September. The staging area was put out to bid, and two bids were submitted: one from Ruby's Inn, which borders US Forest Service Lands, and one from Bryce Canyon Resorts (a part of the Sear-Brown Group/Yosemite Motels), which owned land further north at the corner of Highways 12 and 63. Bryce Canyon Resorts won the contract. Transit system organizers established shuttle stops at the staging area, Ruby's Inn, and an adjoining campground, as well as the park. Future plans called for a new route outside the park to extend service to Tropic and Panguitch. From the start of service, transit system organizers committed themselves to offering fare-free service.

The mandate for transit at Bryce specified that the service must become self-sustaining. The National Park Service had already allocated its transit money to other parks. Bryce Canyon received professional guidance on system design from regional and national offices of the National Park Service, but the park needed to find its own funding mechanisms. Financing for the system would come from transportation fees added onto the park entrance fees typically charged. Utah's Congressional delegation established legal precedence for charging transportation fees. Whereas national park units keep 80 percent of entrance fees and send 20 percent to the National Park Service in Washington, D.C., transportation fee legislation sets precedence to allow adding a $10 transportation fee on top of the $10 entrance fee. Bryce Canyon keeps 100 percent of the transportation fee to pay for the shuttle. The transportation fee comes from every visitor paying for

entry to the park, regardless of the visitor's mode of transportation. The Park would thus keep $18 for every $20 paid by visitors at the entrance gate.

Bryce Canyon based its shuttle funding structure on the theory that all groups entering the park, including people avoiding paying entrance fees by presenting national passes, would pay a transportation fee. Given that many parks at the time were experimenting with new systems, the Washington office of the National Park Service endorsed trying this new method. When the shuttle service started to roll, Bryce Canyon employees collected transportation fees for one day before the complaints from visitors grew so overwhelming that the park had to abandon the practice of collecting from pass holders. This experience showed that the public will only tolerate collection of transportation fees in conjunction with the collection of an entrance fee.

On top of the revelation that pass holders would not pay transportation fees, the Bryce Canyon Shuttle's financial plan received another crippling blow from the introduction of the National Parks Pass, which coincided with the first year of transit operations. Bryce Canyon reported that when the shuttle financing plan was established, between 68 and 80 percent of all visitors paid park entrance fees, as opposed to presenting passes. In 2002 (after the release of the National Parks Pass), only 36 percent of visitors paid fees directly to Bryce Canyon National Park. With the transit finance plan based on receiving a $10 transportation fee from 100 percent of visitor groups, transportation revenue diminished by two-thirds.

Bryce Canyon attributes its low rate of fare collection and its high rate of receiving visitors carrying passes to two primary factors. First, Bryce Canyon sits amidst a cluster of parks in a location where visitors coming from either Salt Lake City or Las Vegas will

likely visit other parks en route to Bryce Canyon (Figure C-2). Visitors would likely purchase a National Parks Pass at the first park they encounter and present passes at future parks. Second, most of the parks in the region have expensive entrance fees ranging from $20 to $30, when a National Parks Pass originally cost $50 to visit unlimited parks for a year. In this situation, the National Parks Pass could pay for itself after a visitor entered two parks, so buying the pass at the beginning of a park tour makes sound financial sense from a visitor's standpoint.

These financial surprises struck, and although visitors eagerly used the Bryce Canyon Shuttle, Bryce Canyon National Park struggled to support the shuttle financially within the first year of operations. Appeals went to Washington for support. By the end of the second year, bail-out funds could not sustain the system. Instead of undertaking expected system growth, Bryce Canyon defaulted on its transit contract because the budget did not weather unanticipated shocks to the plan. Bryce Canyon's transit system organizers had to prioritize financial limitations over visitor demand.

Although defaulting on the contract could have meant the termination of service, Lewis Brothers Stages, the transit operator, did not want to see the concept of transit at Bryce Canyon die. The transit operator and Bryce Canyon negotiated a partial termination to the contract. The new agreement cut service to 35 percent of its original size. Intended to operate multiple routes from 8 a.m. to 8 p.m. from Memorial Day through the end of September, the shuttle had ran in 2002 on a single route from 9 a.m. to 6 p.m. from mid-May through Labor Day. Buses ran as rarely as four times per hour, which still offered a reasonable level of service for passengers. In cutting routes, Bryce Canyon eliminated shuttle service on the green line to the southern end of the park's road

network. Closing the gates on the parking area constructed to serve the shuttle reduced operating costs in 2002 by eliminating a half mile drive to the parking area, even though Bryce Canyon still paid its annual obligation of $300,000 to Bryce Canyon Resorts, which had constructed the facility for the contract. For that tourism season, shuttle riders parked at Ruby's, and visitors approaching the park passed by a vast empty gated parking lot (Figure C-18).



Figure C-18: To save operating costs associated with distance between the staging area and the park, Bryce Canyon National Park closed the gate on its staging area for a season.

Bryce Canyon created its system in isolation without anticipating federal financial assistance. Neglected while Zion received resources, Bryce Canyon initially took pride in independence for its plan for locally-sustained transit; however, when unanticipated difficulties and expenses arose, the strength of independence transformed into weakness due to a lack of a support network to disperse the impact of the problems across a web of

partners. With the advent of obviously long-term financial problems, the park superintendent took responsibility and retired early.

Bryce Canyon has worked toward reinstating shuttle service. The Bryce Canyon Shuttle used the staging area again in 2003 and 2004. The green line route re-opened for the 2004 season, and service expanded again to the previous longer hours and a longer season. The National Park Service appears to have selected the new superintendent for Bryce Canyon based on skills for handling the difficult financial situation and for interacting well with stakeholders affected by transit. Bryce Canyon's chief ranger commands the most intimate park management knowledge of shuttle system history and operations. In hindsight, some (though not all) people in park administration speculate that transit system organizers should have started with a smaller system.

C.4 Impacts

C.4.1 External Influences

A variety of factors influence changes in the tourism industry. At a fundamental level, tourism communities must accept the significant effects of basic factors, such as weather and wildfires. Nearby tourism venues with big events, such as the Olympics in Salt Lake City, might have minor or major impacts, and these impacts could compliment or compete with park attractions, depending on how tourists plan their time.

Two important external factors affected the overall American tourism industry late in 2001: the economic recession and the terrorist attacks of September 11th. Industry experts disagree about whether these factors have had a positive or negative impact. People might be staying home for fear of terrorism or to save money. On the other hand, perhaps they are spending less money on vacations by driving to parks than tourists

would spend if they were to travel far from home. Although foreign visitation to national parks is down, Americans are traveling domestically and identifying with national treasures.

The travel industry in Utah is experiencing some slightly inconsistent dynamics. Visits to national parks in Utah and Utah's state parks peaked in 1996, and visitation has declined fairly steadily since then. Traveler spending in Utah continued to increase for most of those years, but decreased in 2001 for the first time in at least 20 years. With fewer visitors and higher expenditures, visitors were spending more during the booming economy. Travel-related employment continued its upward trend in the state even through 2001 (*151*).

In the region around Bryce Canyon National Park, an economic slump caused by the loss of local mining and forestry industries means that the local population and businesses have reduced capacity to sustain local businesses year-round. Restaurants, retail, and services that provide for both tourist and local populations might have a harder time sustaining operations. In contrast, substantial population growth in Las Vegas might lead to increased park visitation.

C.4.2 Shuttle Impact

Local stakeholders favor the concept of the shuttle, although they express concern about the consistency of shuttle operations. No interviewees expressed concern that shuttle service might detrimentally impact the area.

C.4.2.1 Employment

The shuttle operator for Bryce Canyon National Park trained local residents to drive its buses, and with federal wage rates, bus drivers earn more than county average wages.

When the scope of shuttle operations was reduced to cut costs, the transit operator put a priority on keeping local employees on staff, rather than the people who might travel to the area for seasonal employment. The operator, which is based out of Salt Lake City, further helped the local population around Bryce Canyon at the time of the 2002 Olympics in Salt Lake City by hiring drivers of the Bryce Canyon Shuttle to drive for the one-time off-season event. The training and the federal wage rate have both helped local residents around Bryce Canyon National Park, although one nearby employer claimed that his business loses its opportunity to hire the best local workers because gateway community businesses cannot compete with the federal wage rate, which is not solely determined by the local market.

Apart from people directly employed in transit operations, the Bryce Canyon Shuttle does not appear to impact the workforce in the local area greatly. Transit service does not run near residential areas, and subsequently, few residents ride the bus to commute to work or move around the local area.

C.4.2.2 Visitation Patterns

Business people in gateway communities worry about a primary question related to transit: do people stop coming to parks when transit is introduced? If the number of visitors declines, then the number of people spending money in local businesses declines and the local economy suffers. Similarly, if transit causes an increase in visitation, an upswing in the local economy would likely occur.

Visitation at Bryce Canyon National Park has generally declined in recent years. Bryce Canyon's decline appears pronounced even in comparison with other parks in the region and the nation (Figure C-19). The decline began long before shuttle service

started and does not appear to relate to the presence of the shuttle. In fact, visitation rose for the first year of shuttle operations in 2000. The decline in 2002 to 79 percent of the 1996 visitation level coincided with the substantial cuts in transit coverage and service, and the subsequent slight rebound in 2003 likewise mirrored a return of some of the cut service; however insufficient data exist to conclude that transit affected the visitation numbers. With visitation low for all parks in the region around Bryce Canyon, many gateway community representatives feel that annual negative media messages about congestion in parks are reducing visitation, hence the messages reduce the potential for economic gain in local businesses.

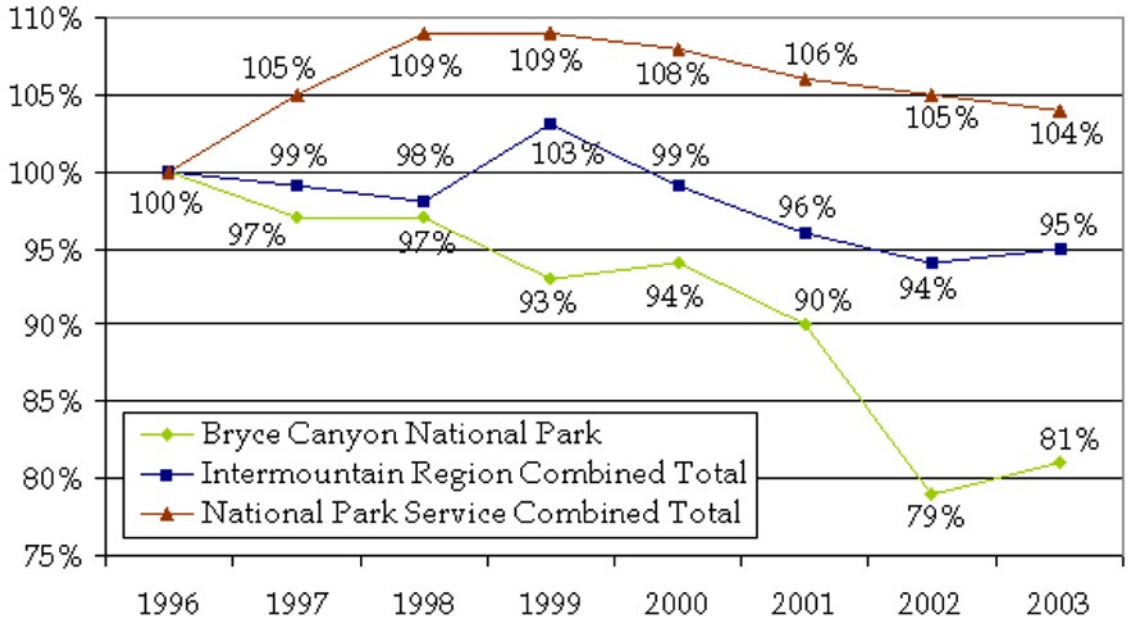


Figure C-19: Park and regional visitation relative to 1996 levels.

Bryce Canyon National Park determines visitation by a vehicle count, which includes private vehicles and buses (*152*). With one road providing the only vehicular access to

the park, this method likely provides an accurate count of vehicles, but visitation calculations depend on how many people are assumed to ride in a given type of vehicle. The comparison of the number of visitors before and after transit started are likely be imperfect because different multipliers apply to buses versus private vehicles. Shifting people from private vehicles to buses before they reach the entrance gate changes in the way in which people are counted. Entrance gate crossings before and after the transit introduction are thus different units of analysis, which makes the accuracy of direct comparison uncertain.

Environmental consequences of the shuttle system can be expected to have a long-term impact on visitation that will be difficult to isolate. Clean air improves the quality of the visitor experience. Bryce Canyon has outstanding visibility on clear days, allowing some of the most expansive viewsheds in the nation; however, at the time of planning the Bryce Canyon shuttle, transit system organizers learned that the alternative fuel technology of the day, such as propane, could not perform at Bryce Canyon's high altitudes. The Bryce Canyon Shuttle would instead use a high-efficiency diesel fuel. Technological improvements in the performance of alternative fuel technology at high altitudes hold promise for Bryce Canyon. Alternative fuel transit vehicles in the region can potentially help the park maintain distinction as a place of pristine air quality. Stifling the trends of increasing vehicle emissions will protect the park from air quality problems that might have repulsed visitors in future years.

C.4.2.3 Ridership

Ridership relative to visitation for Bryce Canyon gives an interesting example of choice ridership. Although the shuttle carried fewer passengers with the drastic service

cuts of 2002, this transit system continued to attract riders commensurate with service levels and visitation. A comparison of monthly data shows a nearly linear relationship between ridership and visitation in 2001 and 2002 (Figure C-20). Of the months indicated in the figure, August 2001 looks disproportionately low because a linear relationship should put ridership closer to 120,000 for a level of visitation near 240,000. Too few data points exist to make a strong case for this theoretical linear relation; however, transit system organizers could examine such relationships as a means of evaluating the shuttle's ability to attract a sufficient number of riders based on varying levels of visitation.

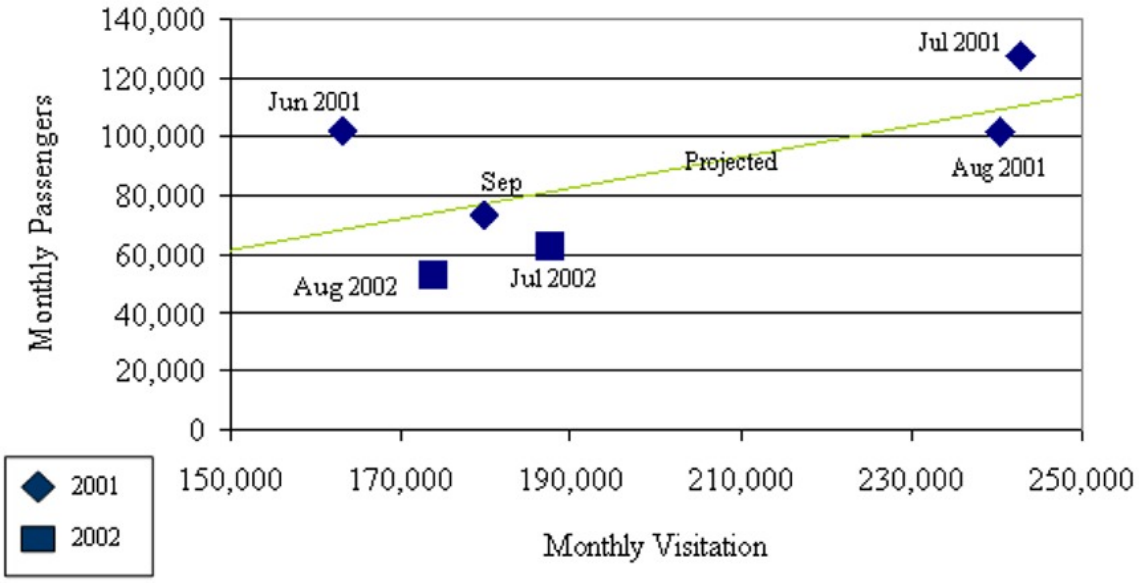


Figure C-20: Ridership compared to visitation.

The predictability of ridership levels strikingly contrasts the unplanned changes in service levels. Something makes this system unusually more appealing than driving a

private vehicle. Bryce Canyon has one park entrance, and many of the primary sites fall along the red line route that continued to operate in 2002. Potentially, Bryce Canyon with its channeled traffic and close proximity of sites has unusually difficult traffic problems that make people seek transportation alternatives. Bus travel time on the red line lasts a half hour from end to end of the route or one hour on an uninterrupted round trip. The relatively short amount of time spent on a bus at Bryce Canyon should appeal to visitors, and most of the stops at Bryce Canyon lie inside the park. More importantly, buses arrive roughly every fifteen minutes, such that visitors do not have to wait long for a ride. Notably, despite the success of the Bryce Canyon Shuttle to attract riders, this transit system has received too few resources to maintain full operations.

A breakdown of seasonal ridership over these two years indicates standard patterns of peaking demand in July with lower levels of demand in shoulder seasons (Figure C-21). Again, 2002 ridership predictably reflects the reduced service capacity of that year, and demand fell lower than previous data would predict, suggesting that demand continued to exist, and increased supply (transit capacity) would allow the demand to reveal itself. In practical terms, a number of people want to park their cars to take the shuttle, and they will do so if the shuttle option exists.

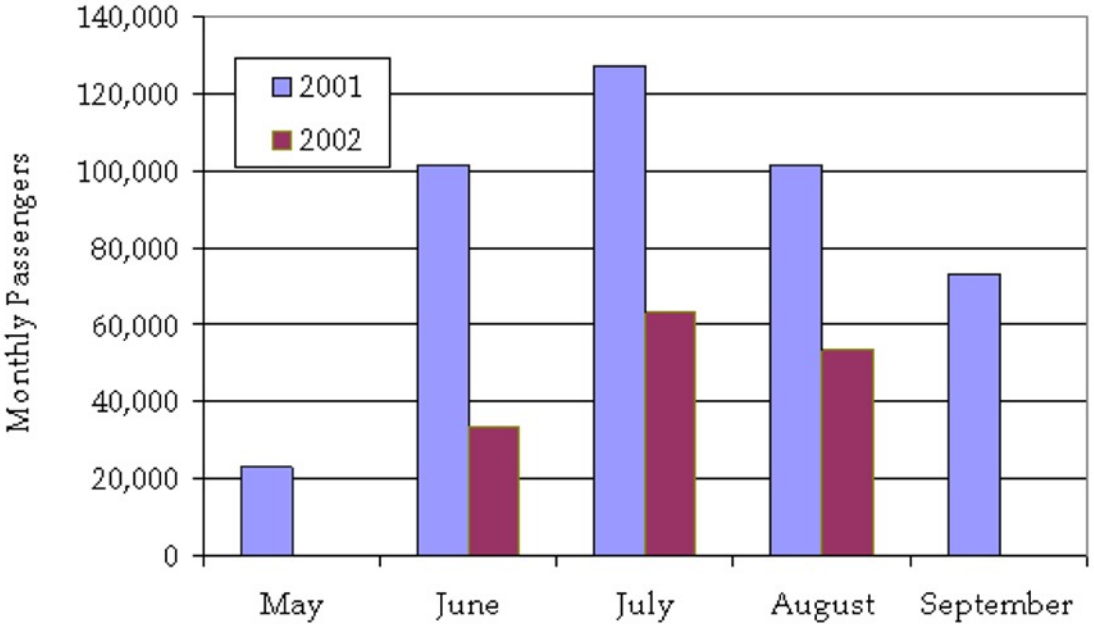


Figure C-21: Seasonal ridership.

With stops only at the entrance of the park and inside the park, trip purposes of passengers on the shuttle system focus on recreational use of the park. Commuter ridership does not appear to represent a large portion of transit ridership. The Bryce Canyon Shuttle explicitly serves a private recreational vehicle campground. Stakeholders stated that the recreational vehicle campground bus stop yields large numbers of passengers because guests would prefer to leave large vehicles parked.

C.4.3 Parking

Bryce Canyon established reduction in parking congestion as a primary goal of shuttle service, based on estimations that one parking space serves every four vehicles entering the park in peak season. With no commercial airports, seaports, or railroads nearby, all visitors must access the park by road, which means that even with transit

service in place, the public needs parking areas. *Hoodoo* newspaper tells people to park at the Shuttle Parking and Boarding Area or Ruby's Inn. Visitors can park at the visitor center for no more than an hour.

Part of the motivation for the staging area involved differentiating the Bryce Canyon system from the Zion system, in which a large portion of shuttle parking is dispersed throughout the town, rather than in a dedicated facility. Another part of the motivation involved providing equal opportunity. Ruby's Inn is the largest employer in the county, and one family owns all of the land at the entrance to the park. If the shuttle system were to serve only Ruby's Inn, then questions of government favoritism arise.

The dedicated staging area offers a secure place to leave vehicles, restroom facilities, and general park information. System designers wanted to create the feeling of entering park lands from the point of accessing transit. On the downside, the staging area defeats one of the well-documented benefits of transit: where people change modes of transportation, commerce has an opportunity to develop. People are far less likely to get off a bus for the purpose of buying a trinket than they are to stop in a store while they are waiting for a bus after they get out of their cars. With no businesses around the parking lots, the staging area curtails potential economic benefits to the gateway community.

The location of the staging area adds to the cost of the transit contract. Situated outside the park, beyond Dixie National Forest lands, and past the first commercial area (Figure C-22 and Figure C-23), the staging area adds an extra half mile onto every transit trip. In the third year of the contract, Bryce Canyon National Park opted to keep the gate locked on the staging area to cut operating costs, even though the contract still required the $300,000 rent payment for the year. For that tourism season, shuttle riders parked at

Ruby's Inn and a parking area Ruby's Inn had built for the pilot shuttle project (Figure C-24). That year showed that lots in the existing commercial area could meet visitor parking needs. The local community was left feeling frustrated that the Park could not make a decision and offer consistency to the public. The Park re-opened the staging area in the 2003 and 2004 seasons.



Figure C-22: Bryce Canyon Shuttle route map (*148*).

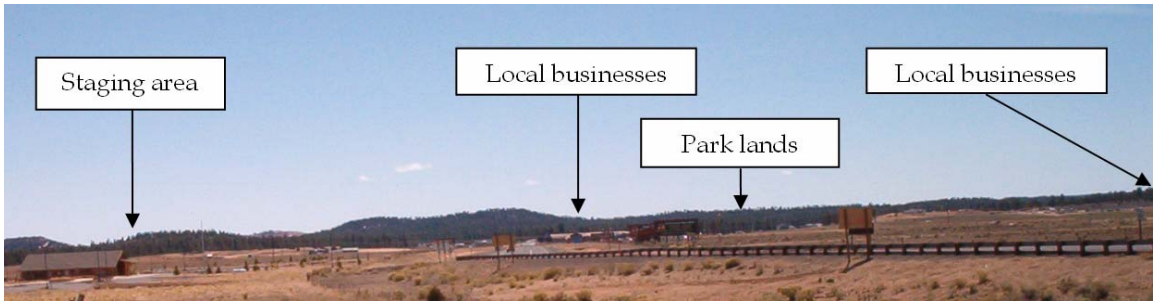


Figure C-23: The Bryce Canyon staging area in relation to local businesses and the national park.



Figure C-24: Owners of Ruby's Inn planned to stage park-and-ride operations at a lot near the border to Dixie National Forest Lands.

If the current location of the staging area poses high operating costs by traveling an extra half mile, why did Bryce Canyon National Park choose not to use the parking lot that Ruby's offered? Government regulations required an open bid because federal agencies cannot write sole-source contracts with private entities to avoid governmental favoritism, and Bryce Canyon Resorts submitted the best bid. The process had its basis in democratic ideas, but interviewees suggested that locals viewed the situation pragmatically in terms of efficiency. Although serving only the largest business in the gateway community would have disproportionately given benefit at the detriment of smaller operations, local residents did not appear concerned about the potential for collusion and negative impacts on small businesses.

The private land where the staging area exists would be an ideal location for development of a commercial area with storefronts rented to small local businesses. This arrangement would provide rental income to Bryce Canyon Resorts and prime location space for local entrepreneurs to develop the local economy. If such a development takes root, its financial viability will likely go hand in hand with an increase in visitation to the national park, such that the Bryce Canyon Shuttle can afford the operating costs of serving the new commercial area in the same way it serves Ruby's Inn. The multiple businesses served resolves concerns of government favoritism to a single business. This solution requires collaboration and trust between the Park and local business owners.

Beyond the staging area, transit service reductions also affected parking inside the park. Cutting service to viewpoints south of Bryce Point means cutting access to backcountry trailheads. People hiking in the backcountry sometimes leave vehicles parked for several days, which means that bus service to these points can free a parking space for a number of people who wan to visit the area for shorter durations. Parking becomes especially cumbersome for people who take one-way hikes because they must leave vehicles at both their start and end points. When Bryce Canyon had to reduce service to backcountry trailheads, hikers and backcountry campers needed to return to the traditional parking-intensive means of accessing their desired trails.

C.4.3.1 Industry Sectors

The most direct impact on businesses comes from the contract to operate the shuttle. At first, Lewis Brothers Stages won a promising contract, but the financial troubles of the shuttle system changed the guaranteed financial benefit for the transit operator. The transit operator could have put Bryce Canyon in default on the original contract, but

anticipating that transit in parks will solidify in the long run, Lewis Brothers Stages willingly renegotiated only a partial termination of the original contract to allow room for the transit support system to stabilize, making future transit operations a profitable long-run investment.



Figure C-25: A local business operates park tours for a fee.

While the transit operator based in Salt Lake City is taking a smaller profit than anticipated, a local tour bus operator lost all anticipation of positive financial gain with the announcement of the scope of the original contract. A local tour bus operator, who had served the area for years and had provided the demonstration project that spurred the development of a full transit system, initially wanted to run the full transit operations, but could not handle the level of business. This operator must now compete with the fare-free shuttle system (Figure C-25). Technically, the shuttle service should not compete

with tour service because tours offer interpretation, and passengers stay with one tour driver. Even so, visitors see the same sights out of shuttle and tour bus windows, and the green line shuttle route has even gained the nickname of the "green line tour." For visitors, this nickname makes it sound like the fare-free shuttle and the private for-fee tour offer identical products. The tour operator claims the shuttle system brought about a 50-percent downturn in tour business (*153*).

The Bryce Canyon Shuttle has provided opportunity for Bryce Canyon Resorts to develop property into a dedicated parking facility with guaranteed income for the duration of the transit contract. On the negative side, this facility could not easily convert to other uses. Except for the shuttle, no demand exists in the area for a giant parking lot; therefore, this land depends on contract continuation to make the development investment pay for itself.

Most visitors to Bryce Canyon will immediately notice Ruby's Inn and its associated businesses. As the largest business in the area, Ruby's has had a long history with the Bryce Canyon Shuttle. Beyond providing a park-and-ride lot for the 1996 shuttle pilot project, Ruby's anticipated taking an important role in long-term shuttle operations, but the anticipation assumed too much. Ruby's business owners allocated a parking area to support park-and-ride for day visitors; however, the National Park Service moved forward in an unanticipated way. The contract to provide a staging area for park-and-ride went out for a request for proposals, and Ruby's Inn did not submit the winning bid. Ruby's had even developed a car care center next to the lot it anticipated for using for shuttle staging with the thought that people would spend the day in the park while their private vehicles underwent a day of maintenance outside the park (Figure C-26). Ruby's

Inn had spent money on the pilot project, the parking area, the car-care center, and reinforcement for the road bed where buses would dwell, but anticipated financial rewards went down the street. Ruby's responded with an aggressive advertising campaign to avoid having potential customers ride by the business complex without getting off of the bus. Billboards spaced in close proximity now line the highway approaching the national park (Figure C-27).



Figure C-26: Ruby's car care center sits close to the park.



Figure C-27: Fearing loss of customers when shuttle buses took people past, Ruby's erected a series of billboards to attract business.

Businesses without contracts directly related to the shuttle also feel impacts. As an unanticipated impact, one local restaurant reported receiving businesses from shuttle bus drivers routinely stopping by for lunch. Such stories of small business impacts do not frequently emerge around Bryce Canyon. Why not? The land use of the area does not lend itself to the economic benefits of transit for local businesses. Only Ruby's sits in a location ideal for customers to use the shuttle and for shuttle passengers to use the businesses as they return to their hotel rooms or private vehicles. Every other business in the area requires people to make a separate stop in their private vehicles, which makes impulse purchases like souvenirs or ice cream cones less likely than if these businesses sat next to the bus stop where people waited or passengers disembarked. As the staging area sits behind a fence and across a multi-lane highway from local businesses, no synergy exists between the transit parking and the commercial areas. Even Bryce Canyon Resorts, which provides the staging area, does not get the benefit of transit-oriented development. Customers of the hotels and restaurant closest to the park-and-ride lot must cross a crowded multi-lane state highway at a curve. This design makes transit access particularly unappealing for pedestrians (Figure C-28).

Businesses around Bryce Canyon at one time anticipated a full-scale transit system, but they soon found they could not predict the level of service from year to year. Given that the buses carried a large number of passengers at the full scale, the reduced scale probably means that traffic congestion has risen with the diminishment of bus service, resulting in a compromised visitor experience. If Bryce Canyon gets a reputation for difficult traffic when other parks in the region have less congestion and even a renowned

shuttle service, then fewer visitors might go to Bryce Canyon, and fewer visitors mean less opportunity for revenue in businesses catering to tourism in the gateway community.



Figure C-28: Gateway community businesses near to the park-and-ride staging area have no safe pedestrian access across the state highway.

Local business owners around Bryce Canyon expressed frustration from having no understanding of the motivations of changes to the shuttle system, and local residents bemoaned the lack of consistency in operations. The businesses also have no sense, knowledge, or guidance for how to use the shuttle to create local economic gain. Communication with the local public would alleviate these problems.

C.4.3.2 Long Term Costs

Bryce Canyon National Park assumed a $18-million dollar ten-year contract with Lewis Brothers Stages on the basis of sound calculations derived from past experience, but circumstances changed and the assumptions of those calculations did not support the changes. Park administration faces the challenge of meeting public expectations for

service, financial realities, and the original mission of the National Park Service to preserve and protect the environment while providing for the enjoyment of visitors. In the short term, Bryce Canyon National Park must meet the financial obligations of the existing contract, but long-term vision for the park must consider how to sustain a transit service that the public has demonstrated it will use. In its favor, the Bryce Canyon Shuttle already has route structures with well-developed infrastructure, such that the shuttle system requires no major capital expenditures in the near future.

A significant portion of Bryce Canyon's annual contract cost arises from the staging area for park-and-ride. The parking model used in Zion, in which local businesses voluntarily provide spaces amidst the commercial area, avoids this annual $300,000 expenditure. Although visitation at Bryce Canyon has declined in the most recent years, the nearly doubling visitation in the twenty years from 1983 to 2003 (up from 472,633 visitors to 903,760) suggests that the prime location of the land where the staging area sits could one day hold its highest value as a commercial area serving tourists. In that case, the $300,000 that Bryce Canyon Resorts earns annually from the parking contract could look less appealing in comparison to the opportunity cost of missing out on the more lucrative development of a commercial area that could help the local economy.

C.4.4 Measures Taken

Proactively, Bryce Canyon tried to pioneer a new financial model that did not require direct subsidy from central offices in Washington. The transportation fees structure and fee collection strategy received support at all levels of decision-making and professional guidance in the National Park Service. What appeared good in theory failed in practice, even though the concept of taking financial responsibility locally has precedence in every

federally-funded transit system in the United States… these systems must provide a local match. Because Bryce Canyon's efforts met with strong public opposition in a year when the National Parks Pass changed the experimental environment, the concept of local responsibility now has a tarnished image in regard to national parks. With pass holders arriving in substantially larger proportions, Bryce Canyon had no opportunity to tweak its theoretical ideas into practical feasibility.

Bryce Canyon has faced some of the toughest financial changes and constraints imaginable, and stakeholders have taken two important steps to addressing the ongoing need for funding operations. First, the partial contract termination required participation and concession from the National Park Service, the transit operator, the riding public, and gateway community businesses and residents who fielded questions and tried to accommodate the fluctuating levels of service. Although the small communities outside Bryce Canyon cannot generate sufficient funding to act as strong financial partners for transit, their positive attitudes and communication with visitors about the transit service do substantially influence the acceptance and use of transit. Every one of these stakeholders demonstrated their support for the transit concept in the way they handled the changes necessary to keep the system operating even at a skeletal level. This support is helping the Bryce Canyon Shuttle survive the present.

Future-minded people are examining how to create an ongoing funding stream to make the transit system sustainable. The natural history associations at Bryce Canyon and Zion, which cannot contribute to transit operations by the nature of their charters, have looked into the feasibility of forming a new joint nonprofit group: the Zion Bryce Foundation. This group can help find and manage corporate sponsorships dedicated to

maintaining and improving transit service in the parks. In consultation with the local natural history associations, the National Park Foundation has explained that after formation, a new nonprofit typically needs three to five years to facilitate contributions.

C.5 Recommendations for Garfield County and Bryce Canyon National Park

- **Weighing financial realities with the local political situation, the National Park Service should re-examine the need for the staging area and use a public process to determine how to handle the staging area and parking for contract renewal.** The best location for shuttle parking is not clear cut. If the Bryce Canyon Shuttle does not use the staging area, contract and operating costs will decrease, and bus passengers will interact more with local businesses. On the downside, ceasing to use the staging area might create ill will with the site provider, leave unused facilities in a prominent location, and demonstrate inconsistency in the eyes of the public. The answer depends on the priorities of the stakeholders involved, and all stakeholders need to work together to make the shuttle system viable.
- **Make communication a top priority.** Where Bryce Canyon had (and to a large degree still has) local support for transit service, the local community now has a sense of a lack of consistency in policy. Transit service initially started with several routes and a dedicated parking facility, but financial difficulties forced cuts in the service. The transit operator reduced route coverage in the park. The dedicated parking facility went in service for the first years, went out of service one year, and went back in service the next year. These inconsistencies arose in response to the changing financial situation. Adjustments to service will happen

with any system, but transit system organizers at Bryce Canyon have had to deal with more than the typical number of changing circumstances. In this situation, open communication must occur to explain to the public what has changed in the situation, the decision criteria used to choose a response, and the response chosen.

- **Work with the local community to develop land use and "urban" design**. Work with the local communities to develop land use and facilities in nodes of commercial activity with safe and appealing pedestrian access. In general, land use around Bryce Canyon has businesses and commercial areas too sparsely located to serve them efficiently with transit and aid in their economic development. Local business organizations and planners need to work together with the park to create transit-oriented development to reap economic benefits from the service. As part of this goal, local leaders should consider conducting a study for land use development close to the entrance of the park.
- **Develop and work toward local planning goals for tourism development.** The success of the park transit system depends on visitor enjoyment, among other factors. The success of Garfield County with its large proportion of publicly owned land depends on tourism and, again, visitor enjoyment. If local communities develop services to make staying in the area around Bryce Canyon more appealing to visitors, then Bryce Canyon and Garfield County can become more of a destination than a pass-through park.
- **Work with partners at the national level.** The National Park Service, as a federal agency, is now working through priorities, finding new resources, and establishing systems for improved transit provision in parks. Bryce Canyon needs

to keep its name at the forefront of discussions to ensure it receives its share of resources. As part of this initiative, Bryce Canyon leaders should actively pursue an agenda to establish a fair allocation system for revenue generated from the National Parks Pass.

- **Encourage the inception and growth of the Zion Bryce Foundation.** Financial limitations have created a major impact on the ability of a well-received transit system to serve a willing public. The National Park Service should find ways to allow people eager to help to make their contributions.

C.6 Possible Implications for All Parks

Primarily, Bryce Canyon's travails demonstrate the value and need for partners at various levels. Transit has high expenses, which can have major effects on park management. Bryce Canyon acted financially independently in launching transit service, which left it isolated when transit finance failed. Federal help in the first year, the willingness of the transit provider to compromise on the contract, and intelligent management allowed the service to survive. The formation of the Zion Bryce Foundation could provide the key to future survival. Overall, partnerships have proven their value and necessity.

Bryce Canyon's story also shows how land use and design can affect the impact of transit. Particularly where gateway regions stretch across long distances, available resources have a large impact on the ability of transit to serve all the destinations system organizers would like to reach. The Bryce Canyon Shuttle, which had intended to expand its route structure to reach more local businesses outside the park, had to cut back on

routes because it could not afford the operating costs of the original design. The service cuts effectively left the shuttle serving one family's business holdings.

Monopolies naturally emerge where resources, such as available private land, are so limited. All national parks with substantial demand show that land closest to park entrances has high appeal for development. Transit impacts conceptions of distance in gateway communities. The distance for the bus to travel to reach stops affects operating costs. The distance for people to walk to a bus stop affects their interest in riding and their interest in visiting a business. Along with distance, design and pedestrian amenity at bus stops can shape the way that visitors interact with transit systems and local businesses.

On the national level, the actions of Bryce Canyon indicate a need to consider all parks in a region as a system. Zion should not get all the resources if the same visitors will visit Bryce Canyon and consider it a poor cousin. Park staff should not have to handle the complaints, and park administration should not have to handle the morale problems of a staff that constantly hears how much better another park handles its visitors. Resource allocation, whether for demonstration projects or for the longer term distribution of revenue from the National Parks Pass, needs to consider the overflow effects of where resources go and where they do not go.

C.7 Summary

In 2000, Bryce Canyon National Park started an immediately successful free shuttle service that drew crowds of passengers who voluntarily parked their private vehicles to enjoy the park without concern for traffic, but within the first year, the system went into a financial tailspin that culminated in a partial termination of contracted shuttle service in

the third year. People close to the system attribute much of the financial shock to the introduction of the National Parks Pass in the same year the shuttle service started. The Pass resulted in a redistribution of entrance fee revenue among parks across the nation, and Bryce Canyon felt a particularly strong negative impact due to its location between other parks where people could buy passes. Transit system organizers subsequently scrambled to find ways to support the shuttle. Amid the turmoil, gateway community businesses found themselves confused by inconsistent changes in shuttle service, and hopes for community gains associated with transit service grew vague in the fog of the confusion. Bryce Canyon provides a strong example of the need for regional thinking in the allocation of resources and the consequences felt throughout a local community when such regional coordination does not take place.

(*144*) Bryce Canyon National Park, *Road System Evaluation*, May 1990.
(*145*) Farnsworth, Armeda Syrett. *The Legacy of Ruby's Inn*, Parish Publishing, 1992.
(*146*) *Garfield County General Plan* amended 26 January, 1998.
(*147*) *Tropic Town, Utah General Plan* adopted February 14, 1996.
(*148*) Bryce Canyon National Park web site graphic, http://www.nps.gov/brca
(*149*) *Hoodoo* newspaper map, Summer 2003 edition..
(*150*) *Hoodoo* newspaper map, Summer 2003 edition..
(*151*) Utah Division of Travel Development Research and Planning, "2002 Chapter on Travel & Tourism Economic Report to the Governor," http://dced.utah.gov/travel/2002_ERG.pdf.pdf.
(*152*) Bryce Canyon National Park Public Use Counting and Reporting Instructions, August 3, 1997, http://www2.nature.nps.gov/stats/pdf/brcaci2000.pdf.
(*153*) Clement, Stephanie. "Trip Report for Stephanie Clement, Conservation Director: Grand Canyon, Zion, Bryce Canyon, and Yosemite National Parks Transportation Study Tour 5/20/01 – 6/03/01" draft report for Friends of Acadia, July 10, 2001.

APPENDIX D: CASE STUDY OF CAPE COD NATIONAL SEASHORE AND PROVINCETOWN AND TRURO, MASSACHUSETTS



Figure D-1: The Provincetown-Truro Shuttle at Cape Cod National Seashore.

D.1 Introduction

Cape Cod National Seashore has operated an in-park shuttle service ever since the ocean claimed an important parking area during a major storm, but recent years have raised interest to use a shuttle to mitigate traffic congestion in and between gateway communities and the national seashore. Local governments on Cape Cod joined together to create the Provincetown-Truro Shuttle, and the shuttle quickly took its place as a popular means of transportation, particularly for seasonal workers who cannot afford to keep a car in this resort setting. Data collection for this report took place during a site visit to Cape Cod from June 22nd through 27th, 2003.

D.2 Background

D.2.1 Cape Cod National Seashore

Cape Cod National Seashore stretches across 43,604 acres (176 square kilometers) of shoreline on the Cape in Massachusetts. It interweaves with local communities along the narrow terrain of the cape (Figure D-2). This linear park provides several distinct public beaches, bicycle trails, and cultural resources. Visitors pay daily entrance fees of ten dollars per vehicle or three dollars per pedestrian or bicyclist. The daily passes contrast with the seven-day passes prevalent at most rural parks. Visitors to Cape Cod typically stay for seven days, but they do not consider the national seashore the primary destination of their trips (*154*). With the establishment of Cape Cod National Seashore came assurance that local residents would retain permanent access to the public lands without fees. Several of the towns have their own town beaches, but residents can also access federal lands without paying daily or seasonal entrance fees. Residents place stickers on their private vehicles to identify them as belonging to local citizens.

The location of Cape Cod National Seashore makes it convenient for short trips and visits. The Cape Cod Chamber of Commerce markets Cape Cod as “a short trip to far away.” The national seashore sits within a one-day drive of major northeastern cities, such as Boston, Providence, and New York City. With such close proximity to metropolitan areas, 2.2 million people visit the seashore annually. Visitors arrive on the Outer Cape by car, bus, ferry, and air carrier. Express ferry trips running several times daily take 90 minutes from Boston to the far tip of the cape, and the slow ferry requires three hours per trip. Cape Air provides year-round service to Boston’s Logan Airport and seasonal service to Nantucket Memorial Airport on Nantucket Island.

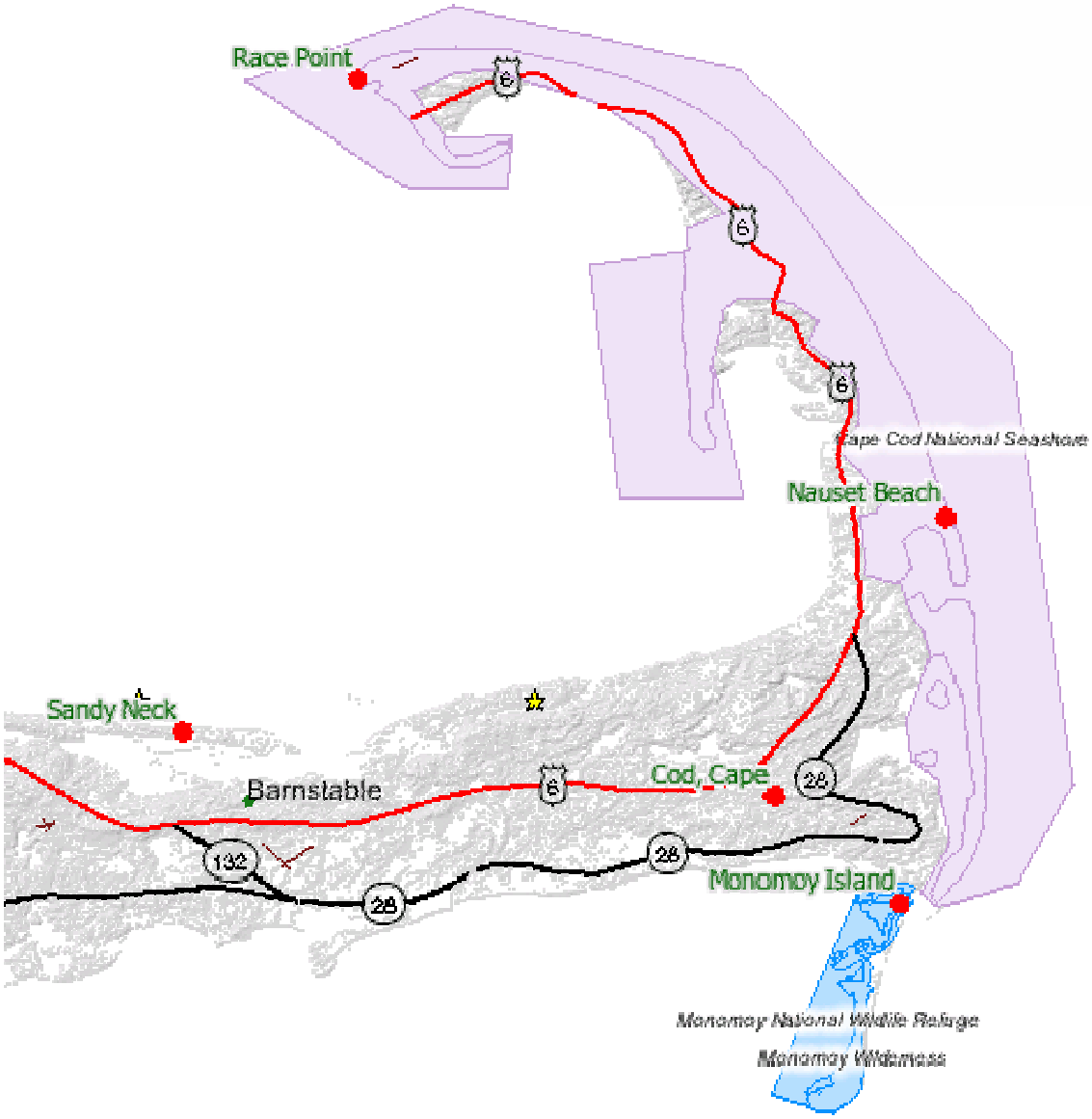


Figure D-2: Cape Cod National Seashore spans Cape Cod's east coast.

In Cape Cod National Seashore's *General Management Plan*, administrators identified that "traffic congestion on Cape Cod has increased to the point of gridlock at some intersections." The *General Management Plan* established strategies to address the

growing problem of circulation, including the expansion of shuttles and related services, encouragement of nonmotorized transportation, and examination of roadway safety and parking supply in the region. Underlying these strategies, the National Park Service recognizes the need for cooperation with local communities. In particular, the *General Management Plan* identifies the need to run shuttle service between federal and local lands. Other strategies included expansion of shuttle service to beaches, alternative energy vehicles, and case-by-case examination of congestion and parking problems. The *General Management Plan* clearly states that in deference to environmental issues, the National Park Service cannot build parking supply responsive to peak demand (*155*)

Visitors currently use a variety of modes to circulate the vicinity of the seashore. Some gateway communities have thriving pedestrian activity, and the flat topography of Cape Cod lends itself well to bicycling (Figure D-3). Cape Cod National Seashore also has involvement in two distinct transit systems:

- The Coast Guard Beach Shuttle moves seashore visitors from a park-and-ride lot to a beach that has no general public parking available. This system has operated since 1988. It provides exclusive access to Coast Guard Beach.
- The Provincetown-Truro Shuttle began operations in 2000 as a partnering venture between the National Park Service and local communities. The system takes people between gateway community destinations and the national seashore.

This report primarily focuses on the history and implementation of the Provincetown-Truro Shuttle. Overview information on the Coast Guard Beach Shuttle appears in this report mostly to provide context of local experience and attitudes on transit in this recreational community.



Figure D-3: Many people travel the flat lands and developed trails of Cape Cod by bicycle, as demonstrated with informal bicycle parking north of Provincetown (top) and formal bicycle parking at the national seashore (bottom).

D.2.2 The Gateway Communities: Provincetown and Truro, Massachusetts

Cape Cod National Seashore sits alongside a number of small communities on the Outer Cape of Cape Cod (Figure D-4). According to the Cape Cod Association of Chamber Executives, Cape Cod offers a total of 560 miles (901 kilometers) of beaches.

Local governments manage beaches on much of the Cape, but the Outer Cape has beaches managed by both local and federal government (Table D-1). National Park Service lands stretch across the Atlantic Ocean side of the Outer Cape, but local communities have rights to operate beaches with access to the ocean.

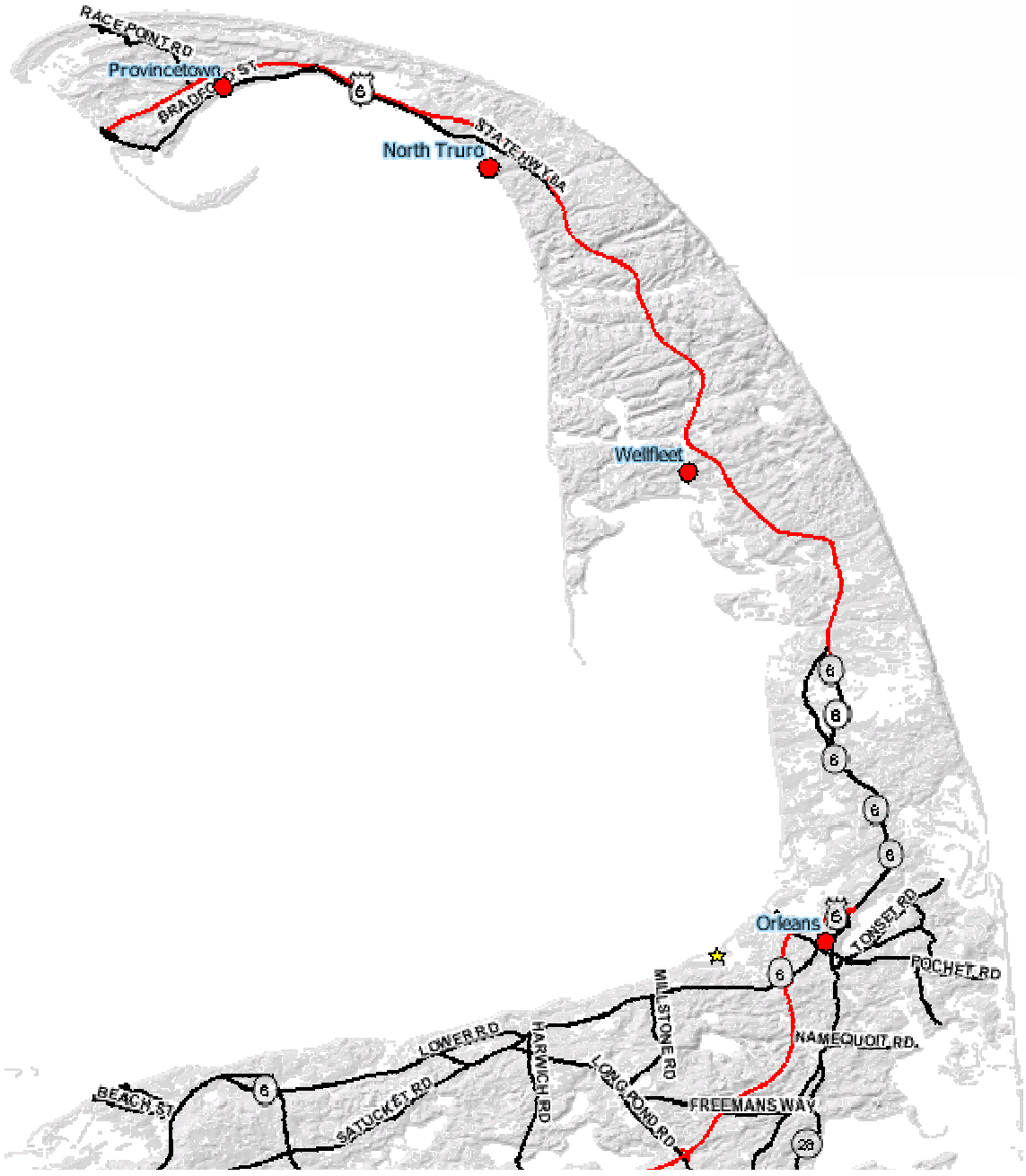


Figure D-4: Local communities surrounding Cape Cod National Seashore.

Table D-1: Beaches on Outer Cape Cod (*156*)

Management	Water Body	Beach
National Park Service	Atlantic Ocean	• Coast Guard Beach (south) • Head of the Meadow (north) • Marconi Beach • Nauset Light Beach • Race Point Beach
	Cape Cod Bay	• Herring Cove Beach
Town of Truro	Atlantic Ocean	• Ballston Beach • Coast Guard Beach (north) • Head of the Meadow (south) • Longnook Beach
	Cape Cod Bay	• Corn Hill Beach • Fisher Beach • Great Hollow Beach • Ryder Beach
Town of Wellfleet	Atlantic Ocean	• Cahoon Hollow Beach • Le Count Hollow Beach • Newcomb Hollow Beach • White Crest Beach
	Cape Cod Bay	• Duck Harbor Beach • Mayo Beach
Town of Eastham	Atlantic Ocean	• None.
	Cape Cod Bay	• Cooks Brook Beach • First Encounter Beach • Kingsbury Beach • Sunken Meadow Beach • Thumpertown Beach
Town of Orleans	Atlantic Ocean	• Orleans (Nauset) Beach
	Cape Cod Bay	• Skaket Beach

Although Cape Cod's population has the oldest median age (45 years) of all counties in New England, the region is experiencing tremendous growth and change, attracting new 300 people per month. Even with increasing population, people do not choose to

live in close quarters. Few people live in each household in towns on the Lower Cape, and few households have children. Provincetown has a particularly low year-round average household size of 1.69, which compares to an average household size of 251 in Massachusetts. Cape population looks particularly sparse in the winter because people use nearly half of Lower Cape Cod's dwellings only seasonally (*157*).

This site report primarily addresses Provincetown and North Truro. These two towns at the outermost reaches of Cape Cod have collaborated with the National Park Service to introduce transit service between community locations and beach destinations. In all, the Outer Cape comprises (from north to south) Provincetown, Truro, Wellfleet, Eastham, and Orleans. Provincetown sits on the farthest tip of Cape Cod (Figure C-8).

At first glance, all of Cape Cod reflects a small and wealthy population (Table D-2). Households of Barnstable County, which covers all of Cape Cod, have a median income 9.5 percent higher than the national median household income, and per capita income in the county exceeds the national average by 17.3 percent. Both of these income measures grew faster in the county than in the nation between 1990 and 2000. With annual per capita income at $26,878 in Provincetown, individual residents of this small town of 3,173 enjoy an even higher standard of living than other residents on Cape Cod, but other economic indicators present a different perspective. Provincetown has a poverty rate 3.1 percentage points higher than in the rest of the United States, which represents nearly triple the rate of the rest of Barnstable County, and while per capita income exceeds per capita income in the county, state, and country, Provincetown households earn a median income only 71.3 percent as high as the median household income in Barnstable County.

Table D-2: Community Characteristics in the 2000 Census and Change from 1990[12]

	Provincetown	Barnstable County	Massachusetts	United States
Population	3,173 +6%	222,230 +19%	6,349,097 +6%	281,421,906 +13%
Median Household Income	$32,731 +64%	$45,933 +45%	$50,502 +37%	$41,944 +40%
Per Capita Income	$26,878 +76%	$25,318 +54%	$25,952 +51%	$21,587 +50%
Population below Poverty	15.5% +0.6	6.9% -0.7	9.3% +0.4	12.4% -0.7 pt
Land Area in Square Miles (Square Kilometers)	1.8 (4.7)	395.8 (1,025.0)	7,838.0 (20,300.3)	3,537,438.4 (9,159,116.1)

Why do Provincetown's per capita income, median household income, and poverty indicators portray such different community characteristics? Possibly, household structure can explain the discrepancy. Many of Provincetown's residents and businesses publicly declare the community to have predominantly gay orientation. Per capita income represents money earned divided by the total population, including retirees, children, and other people not in the workforce. Presumably, Provincetown households have fewer children than other households on Cape Cod, which means that the per capita income does not have to consider as large a non-working population there as typically found in heterosexually-oriented communities. In this case, the median household income better offers a better indicator for economic comparison. Overall, Provincetown appears to have a stratified economy in which the wealth of some people reflects in a high per capita income, but at least half of the households make modest incomes and 15.5 percent of the population lives below poverty.

[12] The United States Census does not list Truro as a designated place.

Housing values further reflect the extreme economic circumstances of Cape Cod. While nearly half of the Lower Cape's homeowners hold no mortgages, roughly one fifth of the Lower Cape's homeowners spend at least 35 percent of their incomes on housing (*157*). People interviewed in this research expressed a local concern that the cost of housing would create a social imbalance that would make living on Cape Cod prohibitive for the working class. Interviewees cited the problems of Nantucket Island where construction workers fly to the island daily because the cost of housing exceeds the cost of daily air transportation.



Figure D-5: Provincetown has old New England character and pedestrian activity.

The unique culture of Provincetown brings the people from different economic classes together. The town offers a festive atmosphere, vibrant street life, and open acceptance of the gay lifestyle, all within the character of an old New England town (Figure D-5). Downtown Provincetown reveals a diversity of transportation options commensurate with its diverse population and businesses (Figure D-6). On narrow streets, small transportation succeeds, as pedestrians, bicyclists, pedicabs, automobiles,

and trucks all share the same right-of-way. Some of the most popular and congested sections of downtown have only one lane for traffic movement.



Figure D-6: Pedestrians, bicycles, and pedicabs mix with cars downtown.



Figure D-7: Adding modern traffic to centuries-old streets looks disastrous.

While the pedestrian activity and vibrant town life give Provincetown a popular resort-area reputation that fills hotels in peak season, the vitality also creates associated traffic problems (Figure D-7). Modern traffic demand in terms of both volume and physical size of vehicles overwhelm local road infrastructure with its legacy design from the early settlement era. This thriving community must balance the need for practical

access, such as trucks delivering goods to stores to support the local economy, with maintaining the cultural character that makes the community popular for leisure trips. The balance does not always appear in traditional forms. For instance, the tight space limitations in public right of way lead to such oddities as signposts physically located in the street (Figure D-8).



Figure D-8: Provincetown has slim roads.

Located south of Provincetown, North Truro offers a strikingly different pace of life. The official web site for Truro claims a current year-round population of 1,800 (*158*). This population lives in a much more rural atmosphere where distances between local facilities, housing and commercial areas requires vehicle access to meet basic needs of mobility (Figure D-9).

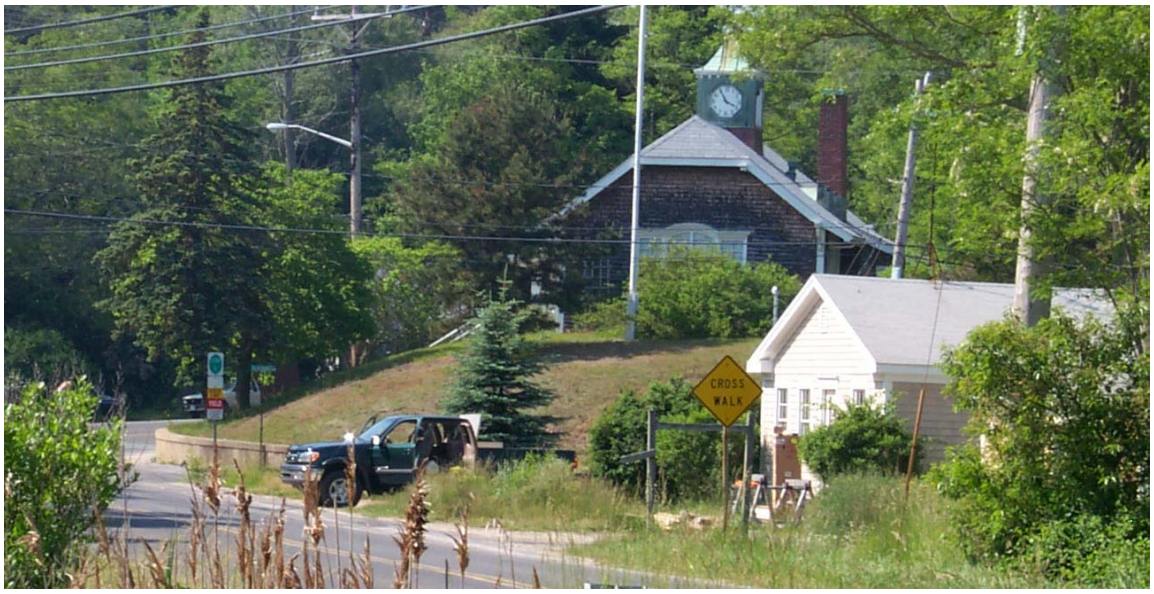


Figure D-9: The rural community of North Truro stands in contrast to the urban life of Provincetown.



Figure D-10: Truro has its own beaches and beach parking.

The Town of Truro operates eight primary beaches within town limits (Table D-1). Truro charges ten dollars per vehicle for daily entrance, commensurate with the fees charged at Cape Cod National Seashore. The community operates parking lots that receive strong patronage (Figure D-10). These beaches and parking areas often appear in close proximity with the federal beaches.

Both Provincetown and Truro serve as resort areas with retail focus catering to the visiting public and vacation amenity, rather than daily practical needs. Many permanent and seasonal residents of Cape Cod's outermost communities go inland to Orleans to shop for basic goods (Figure D-11). Orleans sits 16 miles (26 kilometers) south of Truro and 26 miles (42 kilometers) south of Provincetown (Figure D-4), which means that local residents must plan shopping trips in advance, and people without access to private vehicles need to make special arrangements.



Figure D-11: Seasonal and permanent residents shop in the closest large town.

In terms of access to these communities, private vehicles and buses arrive by road on a single road, U.S. Highway 6. The narrow width of the Outer Cape and the prevalence

of kettle ponds and unstable sands leave no room for traditional road construction to expand road capacity. Provincetown also receives ferry service from Boston, and Provincetown Municipal Airport (PVC) sits north of Provincetown (Figure D-12). This airport has a 3,500-foot (1,067-kilometer) runway that serves an average of 306 operations per day, 94 percent of which are general aviation. Cape Air offers scheduled service, and air passengers can rent vehicles at the airport (Figure D-13).



Figure D-12: The Provincetown Airport offers scheduled service to Boston.



Figure D-13: Airport passengers must either take a taxi or rent a car.

Recognizing that roughly 200,000 people crossed the boundaries of Cape Cod and more than 120,000 private vehicles crossed bridges to the Cape on an average summer day in 1997, Cape Cod established a regional transportation plan to address traffic congestion and mobility needs. Cape Cod's 1997 regional transportation plan set forth five goals (*159*):

1. **"The 'Right' Transportation System** for Cape Cod must be achieved by implementing solutions that are consistent with the character of Cape Cod.
2. **"Modes and Roads** are both a part of planning for Cape Cod. Alternatives to the automobile must be adequately represented in planning for future projects.
3. **"Land Use Causes Transportation Causes Land Use** In other words, land use changes both result from changes in the transportation system and create the need for new transportation projects.
4. **"Traveling Smarter** is important for the future, rather than simply traveling more. New information technologies will help people make intelligent transportation choices such as when to travel and how to travel.
5. **"Working Together** is an important part goal of the long range planning effort. New partnerships need to be formed that cross over the traditional lines of public and private sectors and across levels of government, and old ones need to be strengthened."

The plan placed highest priority on preservation and maintenance of the existing transportation system, which would require more than 75 percent of the region's transportation funding. Another fourteen percent would go to transit.

D.3 The Coast Guard Beach Shuttle

The Coast Guard Beach Shuttle runs between a remote parking lot at Little Creek and the beach. A weather system in 1978 took the parking lot adjacent to the beach into the ocean, and the National Park Service decided to build a new lot inland to allow the coastline time to settle in its new topography. The National Park Service started operating shuttle service to Coast Guard Beach with school buses in 1988, allocating all general visitor parking to the remote lot. Private vehicles are restricted from accessing the main visitor facilities and beach area, and drop-off access was recently terminated.

Cape Cod National Seashore experimented with types of vehicles for this shuttle. Transit operators replaced the school buses with a fleet of used propane buses. Two open-air electric trams with trailers arrived in 1997, but they did not perform well. The transit operation now uses two new Ford Chance coaches with the same trailers. Because these vehicles, which can seat between 25 and 30 people on a tram and between 30 and 35 people on a trailer, cannot accommodate wheelchairs, disabled visitors may drive directly to the beach and park their private vehicles. For the general public, a tram departs every fifteen minutes in peak season (Figure D-14).



Figure D-14: The Coast Guard Beach Shuttle operates propane coaches.

Interviewees expressed that not all local stakeholders like the arrangement. Some community leaders of Eastham feel the National Park Service is failing to provide access to the beach for local residents by restricting private vehicle access directly to the beach.

D.4 The Provincetown-Truro Shuttle

D.4.1 Current Conditions

In 2000, the Provincetown-Truro Shuttle started service between the national seashore and local communities on Bluebird propane-powered buses seating up to 27 people (Figure D-15). The Shuttle operates on twenty-minute headways every day of the week in peak season. Buses run from 5:00 a.m. to 1:00 a.m. from Memorial Day until Columbus Day.



Figure D-15: Provincetown-Truro Shuttle buses.

The Provincetown-Truro Shuttle route system has a hub at MacMillan Wharf in downtown Provincetown (Figure D-16). From this location, people can take buses to and from North Truro, the airport and Race Point Beach, or Provincetown Inn and Herring Cove Beach (Table D-3). Road infrastructure gets tight in Provincetown where the shuttle on Cape Cod travels, but in this case, the shuttle can generally travel wider roads near the most congested parts of town. A grid road infrastructure allows alternate routes.

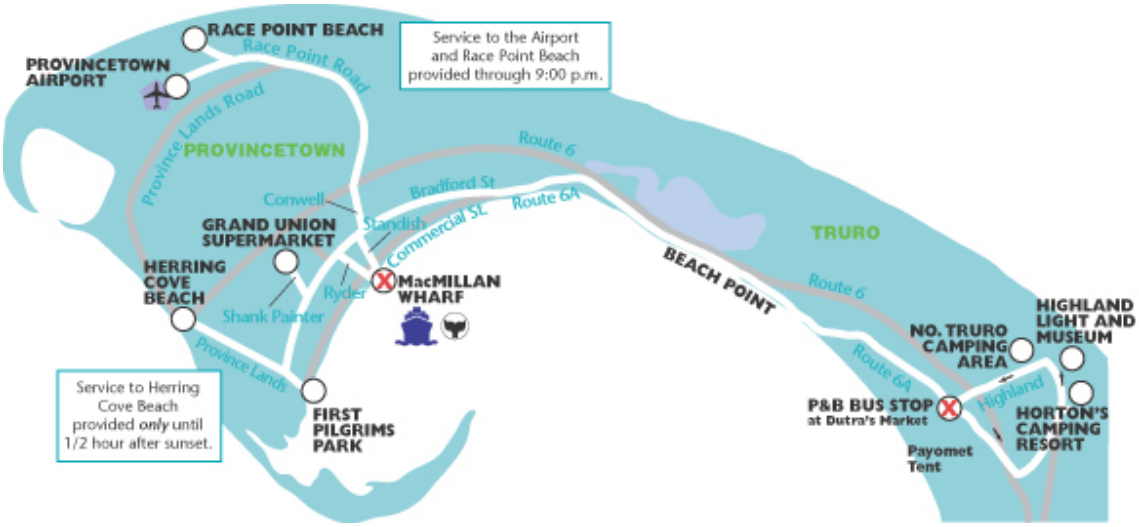


Figure D-16: The Provincetown-Truro Shuttle Route.

Table D-3: Stops on the Provincetown-Truro Shuttle Routes

North Truro to MacMillan Wharf	MacMillan Wharf to Airport and Race Point Beach	MacMillan Wharf to Provincetown Inn and Herring Cove Beach
• Hortons Camping Resort • N.Truro/Dutra's Market • Route 6A in Truro • MacMillan Wharf	• MacMillan Wharf • Beach Point Picnic Area • Airport • Race point Beach	• MacMillan Wharf • Herring Cove Beach • First Pilgrim Park (Provincetown Inn)



Figure D-17: North Truro necessarily has a linear configuration at the cape's tip.

The shuttle route covers miles of road with no concentrated development for logical fixed stops. With no clustering of cottages or single buildings with high occupancy, no strong potential locations for fixed stops exist (Figure D-17). Because the bus cannot practically stop at all businesses, flag stops allow universal access for passengers and equal service for businesses. The few locations that do have fixed stops do not have extensive infrastructure (Figure D-18).



Figure D-18: Fixed stops have no infrastructure other than identifying signs.

The National Park Service and local communities split the cost of the shuttle along budget categories of operating and capital. The National Park Service owns the five buses, and the Cape Cod Transit Authority operates them. Local governments cover the entire operational subsidy needed beyond fare revenue. Passengers pay one-way fares of one dollar, and the Cape Cod Regional Transit Authority sells tokens for these fares (Figure D-19). Passengers may also purchase one-day passes for three dollars. Fares help Cape Cod achieve local funds to meet the matching funds required to receive federal transit money. Transit system organizers for that shuttle are also using this low introductory fare to condition people early in the service to the idea of fares with the intention of avoiding shock to the public with the introduction of fares later.



Figure D-19: The Provincetown-Truro Shuttle started operations amid the structures of an regional transit authority, including fare tokens.

Demand for the Provincetown-Truro Shuttle exceeds crush load often, particularly for events like fireworks on the Fourth of July. The national seashore's proximity to major metropolitan areas likely affects the willingness of visitors to use transit. People who live

in these dense and developed cities probably feel familiar and comfortable with the idea of using public transportation.

Congested roads and buses loaded to capacity lead to late arrivals. For the Provincetown-Truro shuttle, people complain most about a lack of reliability. With twenty-minute headways, a missed bus run can mean substantially missed appointments. Visitors have inflexible restaurant reservations, ferry departures, and golf tee-times. Local businesses complain that unreliable service means employees do not arrive on time for shifts. All of these problems affect tourists, employees, local businesses, and the reputation of shuttle systems in gateway communities.

D.4.2 History: Goals and Lessons

Local leaders on Cape Cod have recognized a transportation problem on the cape for several years and worked toward mitigating the growing problem. Stakeholders have come together to form the Cape Cod Transit Task Force with representation from state government, transportation groups, the local business community, local government, human services providers, citizen advocacy, and Cape Cod National Seashore. This group established five goals for public transportation on Cape Cod (*160*):

1. "Reduce auto dependency by providing mobility options.
2. "Mitigate seasonal traffic by attracting people to the region without cars, and by providing seasonal public transportation options.
3. "Meet the needs of the year-round population for public transportation, especially the needs of those who are 'transit dependant' and in need of human services.
4. "Develop coordination, communication, and cooperation between regional public transportation providers.

5. “Incorporate smart growth and land use planning decisions into the development of public transportation.”

At a 1999 conference in Philadelphia entitled, “New Approaches to Transportation: Planning, Partnerships, and Programs,” officials from Cape Cod National Seashore learned about a new transit system introduced at Acadia National Park and decided that model held potential for Cape Cod. Cape Cod wanted to provide an alternative to gridlock in gateway communities and the national seashore. Acadia’s system had formed through a partnership between the National Park Service, local governments, and other stakeholders. A local transit provider took responsibility for operating the system.

The Provincetown-Truro Shuttle materialized in 2000 with a similar system: the National Park Service donated buses, local communities contributed operating revenue, and the Cape Cod Regional Transit Authority operated the service. Through partnerships, transit system organizers have gained local input on service design, public support, and financial contributions. The Volpe National Transportation Systems Center, which is located in Cambridge, Massachusetts, has performed research on Cape Cod’s transportation system and needs. Stakeholders expressed regard for the work of Volpe staff and the value of such research work.

Many of this study’s interviewees spoke in terms of partnerships, and transit system organizers found value in involving even stakeholders who might have reason to oppose transit. Taxi drivers participated in the planning process for the Provincetown-Truro Shuttle. From the start, these small businesses expressed their concerns for loss of business to the subsidized shuttle, and shuttle route designers accommodated them by reserving the airport for taxi access. This concession brought the support of the taxi

companies, as opposed to a long-standing latent opposition. The Provincetown-Truro Shuttle did start serving the airport in the 2004 season.



Figure D-20: Cape Cod has a new transportation center.

In general, Cape Cod is expanding local transit service and encouraging people not to use private vehicles. The Cape Cod Regional Transit Authority, the Cape Cod Chamber of Commerce, and the Office of Travel and Tourism for the State of Massachusetts co-

sponsored a pamphlet for visitors entitled, "SMART Guide: Car-Free Ways to and around Cape Cod, Martha's Vineyard and Nantucket." This brochure emphasizes that visitors never need to bring cars to Cape Cod because Cape Air serves Provincetown from Boston's Logan Airport; Boston Harbor Cruises and Bay State Cruises serve Provincetown from Boston, and Captain John Boats arrive in Provincetown from Plymouth; and, Bonanza Bus Lines connects with Plymouth and Brockton to provide bus service from Boston, New Bedford, Plymouth, Providence, and New York City. The Provincetown Council on Aging offers van service to Hyannis, Orleans, and Wellfleet for medical appointments and senior entertainment. The Cape Cod Regional Transit Authority officially opened a new transportation center in Hyannis on the southern coast of Cape Cod (Figure D-20).

Several communities on Cape Cod are now discussing ways to expand the Provincetown-Truro Shuttle, which grew to the most heavily ridden transit route on the Cape soon after its inception. Route expansion will help the Shuttle reach more communities and facilitate economic growth through tourism. Discussions of expansion include service to retail stores in Orleans and connection to transit lines that serve the rest of Cape Cod (Figure D-21). Cape Cod National Seashore requested a federal funding allocation to provide twelve additional buses for expanded service.[13] Communities are responding to success of the Provincetown-Truro Shuttle with enthusiasm, but many local leaders flinch at the ongoing commitment to providing a local match for operations.

[13] Since the site visit for this research, the National Park Service has reportedly secured the additional funding, facilitating near-term service expansion to Orleans.

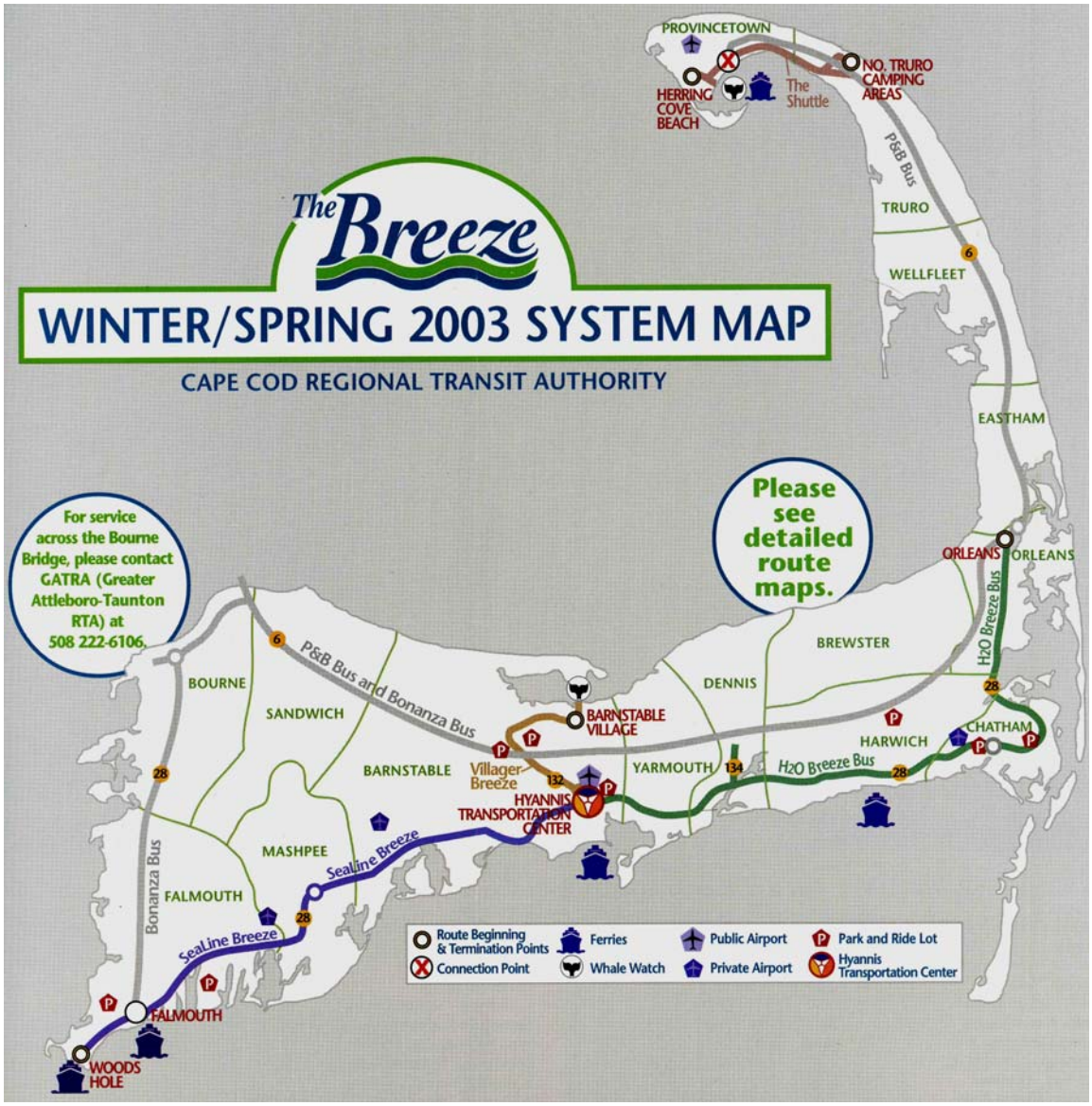


Figure D-21: Route expansion of the Shuttle will open connection to the rest of the route network of Cape Cod Regional Transit Authority.

D.5 Impacts

D.5.1 External Influences

A variety of factors influence changes in the tourism industry. At a fundamental level, tourism communities must accept the significant effects of basic factors, such as

weather and wildfires. Nearby tourism venues with big events might have minor or major impacts, and these impacts could compliment or compete with park attractions, depending on how tourists plan their time.

Two important external factors affected the overall American tourism industry late in 2001: the economic recession and the terrorist attacks of September 11th. Industry experts cite increasing and decreasing influences on tourism since the attacks. People might be staying home for fear of terrorism or to save money. On the other hand, perhaps they are spending less money on vacations by driving to parks than tourists would spend if they were to travel far from home. Although foreign visitation to national parks has decreased recently, Americans are traveling domestically and identifying with national treasures.

Table D-4: Trends in the Massachusetts Travel Industry (*161*)

Year	Expenditures ($ millions)	Employment	State Tax Receipts ($ millions)	Local Tax Receipts ($ millions)
2002	$11,075.4	124,200	$465.6	$264.9
2001	$11,698.2	129,500	$482.5	$274.2
2000	$13,157.9	133,100	$513.4	$293.8
1999	$12,207.0	129,200	$474.4	$271.5
1998	$11,332.6	124,800	$420.7	$254.1

Statewide, Massachusetts saw a decline in 2001 and 2002 in state and local travel-related tax receipts and travel-related employment since a peak in 2000. Tax receipts in 2002 fell below 1999 levels, but not quite as low as 1998 (Table D-4). Overall, shuttle service started in Provincetown and Truro at a time when the entire state started seeing a decline in tourism.

D.5.2 Shuttle Impact

D.5.2.1 Employment

The Provincetown-Truro Shuttle provides seasonal employment for drivers through the Cape Cod Regional Transit Authority. Because transit authority wages cannot compete with the high cost of living on Cape Cod, the Transit Authority has a difficult time hiring and retaining drivers. These difficulties lead to a skeletal staff handling shifts, and some stakeholders reported criticisms of rude drivers. During the site visit for this research, an employee who did not report to work led to an unfilled shift and missed runs. The high cost of living on Cape Cod thus contributes to the reliability problem in shuttle operations.

The Shuttle also has an indirect effect on local employment in terms of providing mobility for low-income workers to access service jobs. The workforce on Cape Cod evolving toward a migrant-worker base has led to a high number of seasonal employees living in the area with no private vehicle. These migrant workers live in campgrounds through the tourist season and commute from North Truro into Provincetown, relying on shuttle service for daily transportation.

D.5.2.2 Visitation Patterns

Business people in gateway communities worry about a primary question related to transit: do people stop coming to parks when transit is introduced? If the number of visitors declines, then the number of people spending money in local businesses declines and the local economy suffers. Similarly, if transit causes an increase in visitation, an upswing in the local economy would likely occur. Given that groups visiting Cape Cod reported daily average group spending of $280 in the fall shoulder season for 1992 (*154*)

and roughly 4.5 million people visit the park annually, gateway communities can expect to feel economic impacts if transit contributes to either attracting or repelling visitors.

Cape Cod has experienced low numbers of visitors since 1996 at a time when the Northeast Region of the National Park Service has seen increases (Figure D-22). These numbers should not be confused. Cities hold many of the parks in the Northeast Region, such as the Statue of Liberty and the site of the Boston Massacre. Comparison between urban sites where many people make quick daytrips and rural sites that require vacation planning can be misleading. Although day trips to Cape Cod would not make a large proportion of visitation to the national seashore, some visitors would arrive for weekend trips that would not require extensive plans and arrangements.

The introduction of the Provincetown-Truro Shuttle occurred in 2000, which coincided with a seven percent drop in visitation; however, subsequent years brought sporadic changes in visitation that make it difficult to attribute the effect from the shuttle. Cape Cod National Seashore has multiple entrances, and it counts private vehicles and buses at a number of locations to derive a visitation estimate from respective multipliers. Beyond indicating how many visitors go to Coast Guard Beach, Race Point, and Herring Cove Beaches (the three currently served by transit), the estimate also includes patrons to a golf course, youth hostel, and other special purpose sites that count visitors using the facilities (*162*).

Environmental consequences of the shuttle system can be expected to have a long-term impact on visitation that will be difficult to isolate. Reduction in vehicle noise and smell improves the quality of the visitor experience. As Cape Cod National Seashore gains a greater reputation as a place of clean air and natural sound, visitors seeking such

an experience will be attracted to the park. Although future surveys might assist in identifying general trends, many visitors might not realize that the absence of a sound or smell is what makes the place special for them. Similarly, stifling the trends of increasing vehicle emissions will protect the park from air quality problems that might have repulsed visitors in future years. How do you isolate the lack of an impact that never happened?

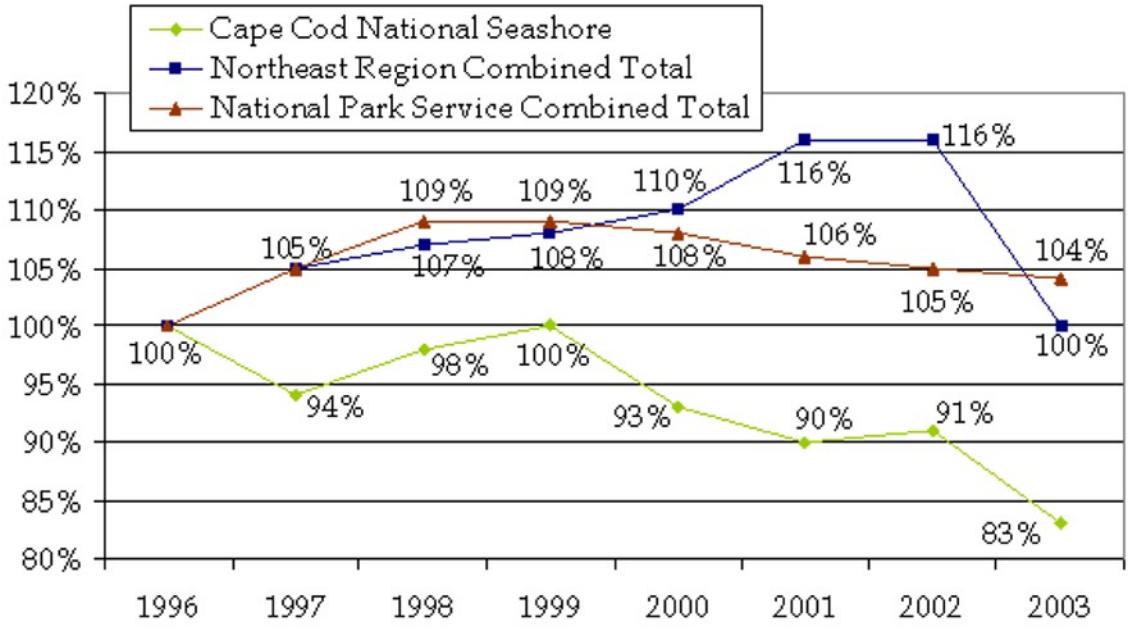


Figure D-22: Park and Regional Visitation Relative to 1996 Levels.

D.5.2.3 Ridership

Juxtaposing ridership and visitation demonstrates even more clearly the difficulty in assigning a relationship (Figure D-23). With only three data points, no clear pattern of increasing or decreasing ridership emerges relative to visitation. The numbers do show

that since the start of the service in 2000, ridership has grown every year despite fluctuating visitation. This trend suggests that as experience with transit grows, visitors are growing accustomed to the system and simultaneously accepting transit as a regular part of local transportation. Continuing efforts to improve and disseminate information about the systems should also affect patronage. Demand will reach equilibrium only after familiarity and service support systems mature and stabilize.

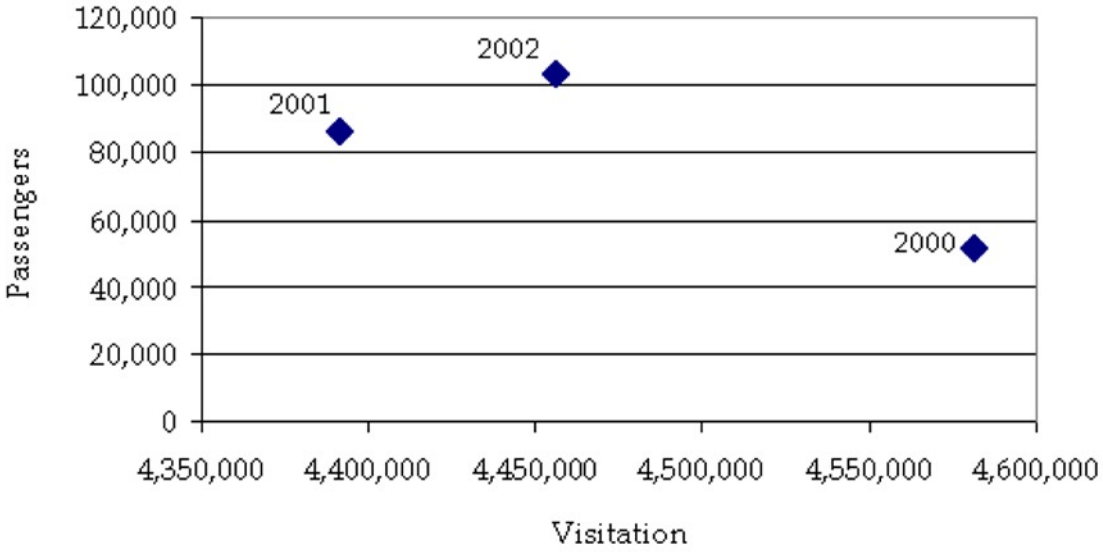


Figure D-23: Annual ridership compared to visitation.

Commuter ridership accounts for a significant, though undefined, proportion of riders. Several interviewees commented that many of the seasonal employees of the region cannot afford the cost of housing on the Outer Cape; therefore, particularly foreign seasonal employees without private vehicles live in campgrounds during the summer

season. They depend on shuttle service for access to jobs in Provincetown from the campgrounds in North Truro (Figure D-24).



Figure D-24: Seasonal employees live in campgrounds and ride transit to work.

Seasonal ridership shows that ridership has especially grown in July, August, and September (Figure D-25). The flagging ridership of June 2002 could indicate an anomaly from an external event, such as weather. Even 2002's introduction of October service brought a strong turnout of riders. By October, most seasonal employees should have returned to school or sought employment elsewhere, so the strong ridership of 3,768 for the twenty days of service operated probably indicates a high proportion of use by visitors and permanent residents.

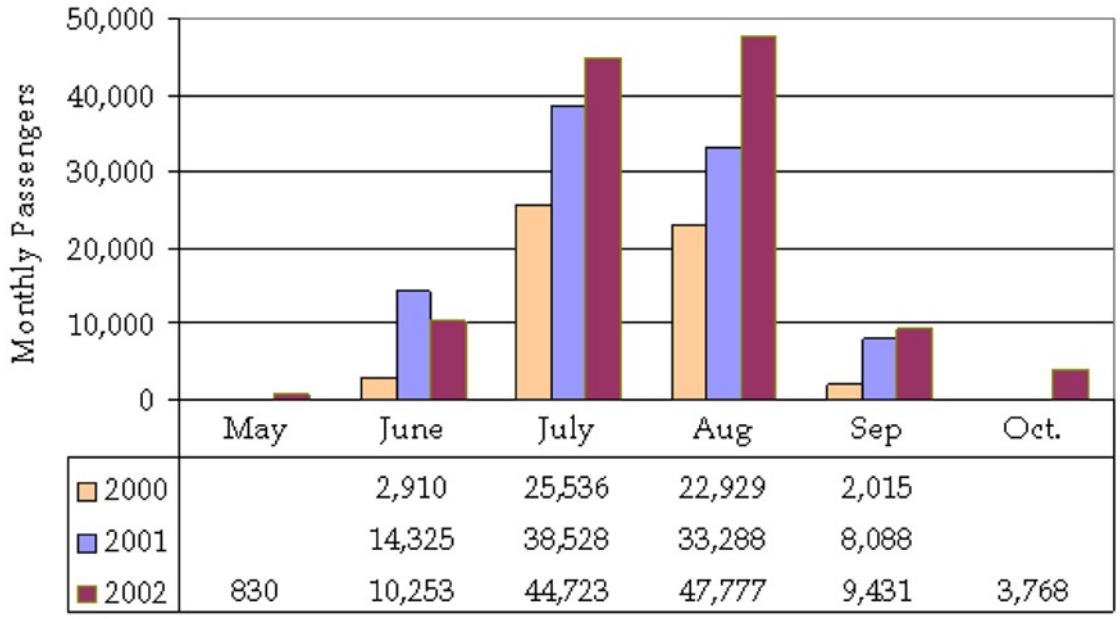


Figure D-25: Seasonal ridership on the Provincetown-Truro Shuttle.

D.5.2.4 Parking

To a large extent, parking congestion motivated the start and continuation of transit operations for Cape Cod National Seashore. The latest visitor and resident study at Cape Cod National Seashore indicated that nearly all visitors to the area arrive by private vehicle, and about 90 percent of them take vehicles to the seashore (*154*). The loss of a substantial parking lot in 1978 prompted the need for the general public to access Coast Guard Beach via parking and riding from a remote lot (Figure D-26). Until recent years, the National Park Service allowed vehicles to drop people off near the beach, but now rangers stop all private vehicles without permits for access under the Americans with Disabilities Act.

Stakeholders in Eastham are reacting to the required park-and-ride and the more recent restriction on drop-off access to Coast Guard Beach. Town leaders are considering

building a new beach for public access because residents cannot access Coast Guard Beach on the National Seashore by private vehicle, and the fifteen-minute headways of the shuttle service do not meet local needs. Many workers in the area hold multiple jobs, so if they have three hours between jobs, the workers do not have time to wait fifteen minutes each way for a shuttle; furthermore, shuttles fill to capacity at peak times, leaving passengers waiting another fifteen minutes for the next shuttle.

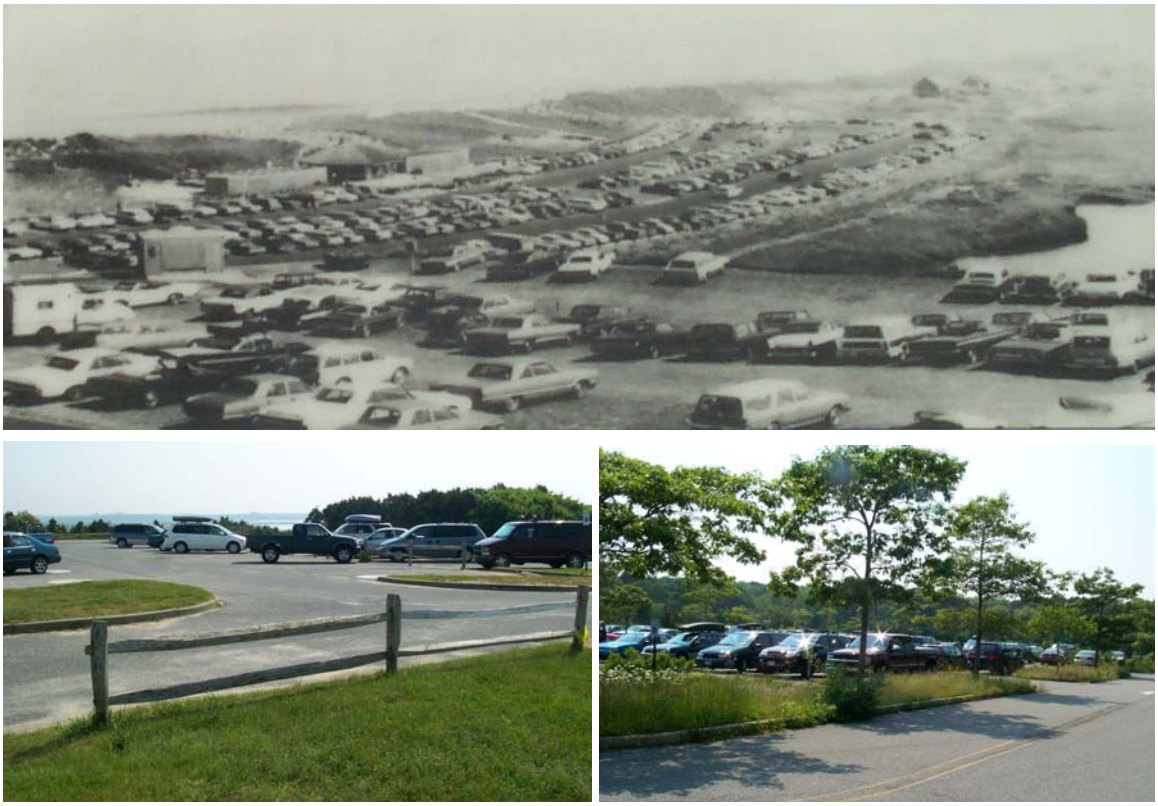


Figure D-26: The parking lot at Coast Guard Beach (top) disappeared into the ocean after a winter storm in February 1978. Now, visitors ride to the beach from a remote lot (bottom).

Eastham might have additional motivation to open another beach because the town does not manage any beaches on the Atlantic Ocean. Eastham's existing five beaches

allow visitors to access Cape Cod Bay (Table D-1). A beach on the Atlantic side of the Outer Cape might represent an important revenue opportunity, given that beaches charge ten dollars per vehicle. Town stakeholders might also consider a town-managed beach on the Atlantic Ocean to pose a marketing opportunity to attract visitors to Eastham. Currently, parking lots at Coast Guard Beach and Nauset Light Beach, which are the National Park Service beaches in Eastham, fill to capacity (Table D-5); therefore, expanded capacity could help satisfy latent demand. If so, Eastham residents and businesses face the negative economic impact of construction and operating costs for a new beach; however, in the longer run, Eastham might expect financial gain from parking revenue and the attraction of tourists to the town.

Table D-5: Beach Parking Capacities at Cape Cod National Seashore (*163*)

Beach	Spaces	Situation
Coast Guard Beach	418	Fills 11 a.m. to 1 p.m.
Nauset Light Beach	176	Full by 10 a.m.
Marconi Beach	530	Occasionally fills
Head of the Meadow	365	Rarely fills
Race Point	355	Rarely fills
Herring Cove	557	Fills 10 a.m. to 12 p.m.

Town-managed beaches already exist all along the Outer Cape (Table D-1). As an interesting example of competition between town and federal management of beaches, the Head of the Meadow Beach to the north falls under the jurisdiction of the National Park Service, and Truro operates the southern beach at Head of the Meadow. Visitors approach the beach area and find a fork in the road where either fork leads to parking

areas with identical fees and beaches located within a short walking distance of each other (Figure D-27).



Figure D-27: Parking fee revenues respond to competitor prices when competition sits just up the road.

Problems with parking extend all along the coast, and the tight streets of Provincetown exacerbate the problem. The Provincetown Police Department created a brochure to guide visitors, warning them that parking "enforcement is necessarily strict to keep traffic flowing safely." Tourists receive specific instructions to order pizzas in advance, to run into video stores to drop off videos, and not to expect four-way flashers or hand-written notes on dashboards to excuse parking violations.

Heavy parking demand in Provincetown on Cape Cod fostered a lucrative revenue collection situation. Municipal parking lots charge a flat fee between ten and twenty dollars, and little parking is available in the town outside the designated lots (Figure D-28). When the Provincetown-Truro Shuttle began operations, municipal parking revenue went down by $30,000 per year, while revenue from parking enforcement remained stable. Town officials accept this negative impact on parking revenue collection as an

annual cost of providing the necessary shuttle service. The police department reports no change in revenue from parking violations since the introduction of the Provincetown-Truro Shuttle.



Figure D-28: Provincetown has lost $30,000 in annual income from lots like McMillan Wharf that charge $20 per vehicle.



Figure D-29: The Shuttle eases Race Point Beach day-parking demand.

The Provincetown-Truro Shuttle serves two parking lots for the National Park Service: Race Point Beach (Figure D-29) and Herring Cove Beach. Peak demand for

these parking lots occurs during the day, and shuttle service ends at sunset for Herring Cove Beach and at 9:00 p.m. for Race Point Beach.

D.5.2.5 Industry Sectors

Most businesses in Provincetown operate at capacity through the peak season. Stakeholders there saw the shuttle as a means of reducing traffic congestion, but the question of economic impacts received no particular response. Neither the local chamber of commerce nor informal discussions with local businesses revealed observations of increases or decreases in local business activity.

Presumably, some benefits would have emerged in terms of increased business for Truro lodging establishments that now can offer easier access to Provincetown. Also, people traveling without a vehicle should increase pedestrian traffic around and in local businesses. The thriving local business community could not distinguish whether such benefits have occurred. It appeared that people were not made aware that they should watch for these changes in the local economy.

As the one industry that stepped forward from the planning stages of the Provincetown-Truro shuttle, the taxis stated their vested interest in avoiding negative impact from the start. Anecdotally, the first years of the service brought some economic benefit to taxi companies because visitors would leave their private vehicles at lodging establishments to ride the shuttle for an evening's entertainment. Visitors who missed the last shuttle run of the evening would need taxis for their return trip. Taxi companies also received the protection of exclusive service to the airport until 2004.

D.5.2.6 Long Term Costs

The Provincetown-Truro Shuttle has taken a niche in an existing regional transit system with experience in balancing long-term costs. The National Park Service recognized that it could more easily provide funds for capital than for operations, so it entered into the partnership for the shuttle with a role designated for the purchase of capital equipment. This cost will recur under two circumstances: the demonstrated success of the shuttle in attracting ridership suggests that system expansion will require additional buses, and the end of the viable life of buses (between five and ten years, depending on manufacturing and utilization) will require a replacement fleet. Cape Cod National Seashore will need to determine if it can continue to uphold the financial responsibilities of participation in this partnership.

On the operating side, Cape Cod Regional Transit Authority already operates an established service with funding mechanisms in place. Operating funds needed in excess of fare revenue generated come from state and federal subsidy sources.

D.5.3 Measures Taken

Cape Cod National Seashore recently instituted a transportation fee to cover costs associated with the Coast Guard Beach Shuttle. Motivated by new transit systems starting in the last five years, Congress established the transportation fee structure to allow parks to allocate resources locally. Whereas national park units keep 80 percent of entrance fees and send 20 percent to the National Park Service in Washington, D.C., transportation fee legislation sets precedence to allow adding a transportation fee on top of the entrance fee. Transportation fees at Cape Cod National Seashore will allow that park unit to keep 100 percent of the transportation fee to dedicate to shuttle service.

D.6 Recommendations for Cape Cod and Cape Cod National Seashore

The two shuttle systems serving Cape Cod National Seashore appear to make progress toward the goals established for them. The Coast Guard Beach Shuttle successfully removes vehicle traffic from immediate proximity to the unstable location previously used, and the Provincetown-Truro Shuttle has attracted ridership and taken people out of private vehicles. The Provincetown-Truro Shuttle has also managed to provide mobility and access to jobs for low-income seasonal workers living in campgrounds. Reliability has emerged as the primary problem with this shuttle system. Several measures can help the situation:

- **Increase shuttle frequency.** Some people depend heavily on the Provincetown-Truro Shuttle, but people who would ride by choice might choose to take private vehicles, rather than risk missing an appointment due to lack of reliability. If local traffic and staffing conditions make reliability difficult to ensure, then increasing frequency could help. If buses depart every ten minutes and one run is missed, it is less important that a missed run on a twenty-minute headway.
- **Introduce intelligent transportation systems (ITS).** Acadia National Park, which has already served as a model for the Provincetown-Truro Shuttle, has pioneered development of intelligent transportation systems to facilitate visitor circulation. An extensive survey study has shown that 80 percent of bus riders at Acadia decide to ride the bus there partially because they see changeable message signs with real-time arrival information, and 80 percent of those riders feel the real-time information saves them time (*164*). Real-time information would greatly help visitors and residents of Provincetown and Truro feel confident that

the shuttle can deliver them to their destinations when they need to arrive; advance information of a missed run will allow people to make alternative arrangements in time to avoid missing an appointment.

- **Educate stakeholders on the transportation and economic impacts of transit.** When mentioned to stakeholders, the concept of increased shuttle frequency appealed to stakeholders; however, the realization that increasing service also increases costs made the idea less appealing. Cape Cod stakeholders are to be congratulated for their practical understanding of the financial realities of transit provision, but local business communities appeared unaware of the types of economic benefits that could be fostered in local establishments. Overall, these might benefit from increased knowledge of the effect of increased service on ridership, local traffic conditions, and local businesses.

D.7 Possible Implications for All Parks

The Provincetown-Truro Shuttle demonstrates the need for reliability in transit service. Transit earns a local reputation, and permanent residents, seasonal workers, and visitors will all respond to the ability of a shuttle to deliver them where they need to go on time. Many transit systems for national parks and gateway communities emerge at least in part due to congested conditions; therefore, transit system organizers need to consider how to achieve reliable service that will gain a strong local reputation.

The Provincetown-Truro Shuttle created both positive and negative unforeseen impacts. Provincetown's $30,000 annual decrease in parking revenue shows that changing circulation patterns can cost communities, but the attitude of Provincetown officials reveals that the associated reduction in traffic and parking congestion justified

the loss. Also on the positive side, shuttle service has provided access to jobs and mobility for low-income workers in a resort area where the cost of living is threatening to destabilize the ability of the community to sustain its needed workforce.

Consistency in management at Cape Cod National Seashore repeatedly emerged in conversations with stakeholders as one of the strongest facilitating forces for forming the partnership that led to the Provincetown-Truro Shuttle. Now with roughly a decade of experience at Cape Cod National Seashore, the current superintendent has demonstrated commitment to the local area, ability to work interactively with community leaders, and knowledge of the local environment.[14] In addition, the facility manager of Cape Cod National Seashore commands intimate knowledge of shuttle history and operations. The situation with Eastham leaders discussing opening a community beach underscores the need to address community needs through a continuing dialog with local leaders; otherwise, local leaders might work around, rather than with, the partnership.

Cape Cod National Seashore's superintendent expressed noteworthy interest in innovation and opportunities to participate in trying new ideas. This eagerness for innovation invites the creativity and experimentation needed to address long-standing problems of traffic congestion that have grown through traditional systems. As national park administrators across the nation create such environments of experimentation, modern solutions can apply to modern transportation problems.

Finally, the demonstrated regional commitment to car-free travel helps to create the success of shuttle service. With chambers of commerce publicizing and distributing

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[14] Since the site visit for this research, the superintendent assumed a regional role; another person has taken the Cape Cod National Seashore superintendency.

brochures on car-free travel, visitors can quickly perceive the viability of traveling by transit, bicycle, ferry, plane, and other modes of transportation that do not contribute to traffic and parking congestion.

D.8 Summary

Cape Cod National Seashore has needed transit to address tremendous parking problems created by heavy private vehicle demand and the disappearance of a primary parking lot into the ocean. A storm in 1978 necessitated moving all general private vehicle parking for Coast Guard Beach to a remote parking lot served by a shuttle. This policy and the subsequent restriction against dropping off day visitors near the beach have led the Town of Eastham to discuss building a new beach for local residents. Tight historic roads, narrow strips of developable land, and modern traffic demand led to a partnership between Cape Cod National Seashore and local communities to get the Cape Cod Regional Transit Authority to initiate service for the Provincetown-Truro Shuttle. In this partnership, the National Park Service provided vehicles, and local communities provided a local match for state and federal funding of operations. Provincetown also noticed an annual parking revenue decrease of $30,000, but officials view this loss of revenue as part of its contribution to the partnership and mitigation of downtown traffic congestion. The shuttle quickly grew in popularity to have the highest demand of all of the systems run on Cape Cod, and transit planners are considering ways to expand the service. Shuttle service has given access to jobs to low-wage seasonal workers. The shuttle's reputation has one important mar: reliability. People with inflexible schedules of ferry departures, restaurant reservations in a crowded town, tee times, and work shifts cannot always expect the shuttle to arrive every twenty minutes as promised. Shuttle

frequency should increase, thus reducing the consequence of a missed schedule, but the high cost of living on Cape Cod makes it difficult to hire bus drivers at typical wages.

(*154*) Manning, Robert E. "Cape Cod National Seashore Visitor and Resident Study Executive Summary," undated.
(*155*) Cape Cod National Seashore *General Management Plan*, 1998. http://www.nps.gov/caco/management/gmp/GMPindex.html
(*156*) National Park Service, Cape Cod National Seashore official map.
(*157*) Francese, Peter. "Lower Cape Demographic Trends & Development Issues," a presentation for the Lower Cape Cod Community Development Corporation, June 3, 2003.
(*158*) Truro, Cape Cod, Massachusetts web site, http://www.truro-ma.gov/index.html accessed December 22, 2004.
(*159*) Cape Cod 1997 Regional Transportation Plan, http://www.gocapecod.org/rtp/tranplan.htm
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APPENDIX E: CASE STUDY OF DENALI NATIONAL PARK AND PRESERVE AND DENALI BOROUGH, ALASKA



Figure E-1: Denali National Park and Preserve.

E.1 Introduction

As the National Park Service advances in its mission to address surface transportation problems in the park system, local communities around parks wonder how changing patterns of visitation will affect them. Examining the effects of transit in parks that recently have introduced transit or have made major changes to existing transit service can offer potential insights on what gateway communities can expect to result from alternative transportation systems.

Denali National Park and Preserve has a long-standing tradition of operating transit to transport visitors to points of interest in the park. With more than three decades of experience with private vehicle restrictions on park roads, Denali offers an example of how visitors handle the restrictions and shuttle service provided in lieu of private vehicle access. Park administrators are now also considering coordination with gateway community leaders and businesses to offer public shuttle service between park lands and amenities offered outside the park. Data collection for this report took place during a site visit to Denali June 5th through 12th, 2003.

This report comes as part of a larger research project examining the impact of transit at a number of national parks and gateway communities. Field data collection here have contributed to a multiple-case study analysis, in which local stakeholders of various interests (representatives from the towns, parks, and transit operators) were interviewed to determine the overall impact of transit on segments of local communities and on local regions for each of several parks. Information for the case studies comes from a combination of interview results, public documents, direct observation of how the transit system serves the local environment, and archival data on visitation and travel patterns.

This site report does not consider this location's experience with transit in comparison with other similar locations. These analyses appear in the full report. The results of this site report will interest the park and community studied, other parks and communities entertaining or implementing transit, and the National Park Service, as it continues to develop transit strategies at the national level. This research was made possible in part by a grant from the National Park Foundation through the support of the Ford Motor

Company, a Proud Partner of America's National Parks. The National Park Service provided additional funding.

E.2 Background

E.2.1 Denali National Park and Preserve

Denali National Park and Preserve takes its name from its primary feature: Denali (Figure E-1), the largest mountain on the North American continent (formerly named Mount McKinley, hence the park's former name, Mount McKinley National Park). Denali National Park and Preserve administration has long expressed concern that Denali's superlative attributes might attract more attention than the natural environment can handle. With 2001 visitation of 360,191, this park attracts more visitors than any other parks in the Alaska Region of the National Park Service, where the short visitor season runs from late May through early September. The park sits on the Alaska Railroad and on the George Parks Highway, which connects Alaska's primary population centers of Anchorage on the coast (237 miles (381 kilometers) to the south) and Fairbanks (121 miles (195 kilometers) to the north (Figure E-2). Cruise ship companies actively market tour packages that include time in port for passengers to take the train to Denali, which brings large numbers of tourists in pulses. Private vehicles may drive along 14.8 miles (23.8 kilometers) of Denali Park Road to the Savage River Bridge, but only shuttle buses, bicycles, pack animals, and hikers are permitted to go further inside the park. Shuttle bus capacity is purposely limited to protect the natural resources, which implies that unconstrained demand might exceed reported visitation numbers. Stakeholders report that visitors typically stay in the area for only a half day, as allocated in cruise ship excursion packages.

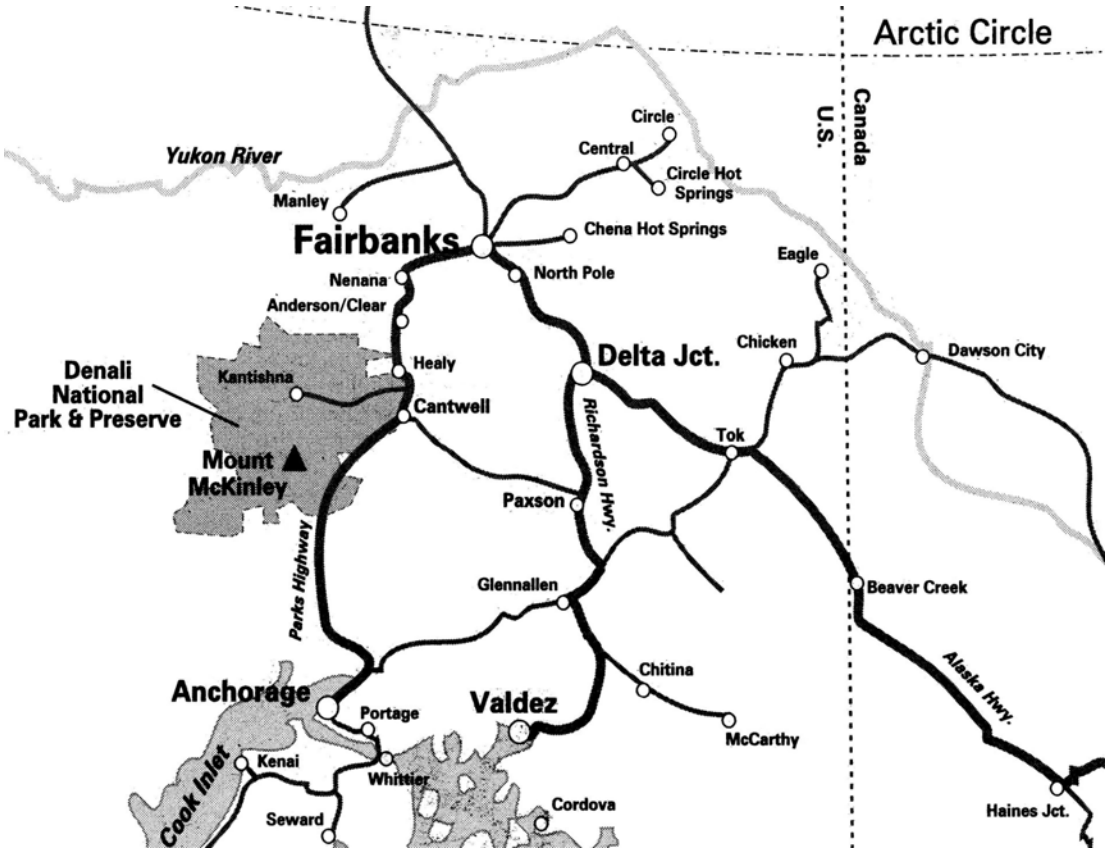


Figure E-2: Denali National Park and Preserve map (*165*).

The entire national park and preserve extends across 6,028,762.5 acres (24,397.5 square kilometers), offering public access to the mountains and tundra of central Alaska. In all, Denali National Park and Preserve contains the largest continuously protected ecosystem in the world (*166*). Several official designations apply to the contiguous land. South of Denali National Park, the State of Alaska established Denali State Park in 1970. The Alaska National Interest Lands Conservation Act of 1980 (ANILCA) expanded the original national park from the area north of the mountain southward to its present size of 4.7 million acres (19,121 square kilometers). ANILCA also established the national

preserve on 1.3 million surrounding acres (5,277 square kilometers). Each of the government land designations has unique implications. The federal government sets aside national preserve lands for the express purpose of maintaining a wilderness ecosystem in the most pristine balance possible. The preserve lands do not cater to visitors. The mission statement of the National Park Service contains the split directive "to conserve the scenery and the natural and historic objects and the wildlife therein" and "to provide for the enjoyment of same," which means that Denali's lands designated as national park lands must balance accommodating visitors with protecting the natural resource (*167*). Visitors to national parks receive instructions to leave no trace of their visits and take no natural souvenirs from the lands. The National Park Service encourages observation and passive recreation for visitors. Recognizing the need for active outdoor recreation in the area, which includes mountain climbing, river floating, and other activities that wear more heavily on the natural environment, Denali State Park offers outdoor lands specifically catering to recreation.

Transportation has taken a prominent role in shaping the management and visitor experience of Denali National Park. The completion of the Alaska Railroad from Seward to Fairbanks in 1923 brought the first public access to the park and annual total visitation of 40 visitors. With the construction of 40 miles (64 kilometers) of road into the park in 1928, the railroad transported private vehicles, and visitation rose to between 400 and 500 people that year. To this day, the park has a train station and an airport within its borders (Figure E-3 and Figure E-4), and the train brings roughly one half of Denali's visitors to the area.



Figure E-3: Denali receives many of its visitors from a rail depot inside the park.



Figure E-4: An airstrip provides access to interior facilities.



Figure E-5: The primary road into Denali telescopes in capacity.

Denali's road designers created a telescoping road form that progresses in steps from two paved lanes to a one-lane road with pullouts for passing (Figure E-5). As visitors ride along the road, they experience a sense of traveling further and further out of the developed world and into the wilderness. The design creates an environment incapable of handling large volumes of vehicles. Stakeholders feel the road design necessitates private vehicle restrictions because drivers unfamiliar with the terrain and distracted by sightseeing activities could not safely navigate the road in traffic. Interviewees highly regarded driver training and experience as attributes of the bus system. Shuttle drivers need particular skill to navigate large buses around tight corners on cliffs when oncoming buses increase the challenge (Figure E-6). Trained drivers have navigated the sometimes treacherous terrain with a strong safety record for three decades.

The most profound transportation actions took place in 1972 when Alaska built the George Parks Highway between Fairbanks and Anchorage and ran it directly outside Denali's main entrance. The National Park Service made a major policy change in anticipation of increased vehicle traffic to the park: the park restricted private vehicles

and instituted full-scale transit service to provide visitor access to the park interior (Figure E-7). Denali's 1986 *General Management Plan* augmented the policy by setting caps on the number of vehicles permitted to enter the park (*166*).



Figure E-6: The narrow unpaved road creates tight traffic conditions.



Figure E-7: At Savage River, all vehicles must sign into a checkpoint to gain further access to the park interior.

Anticipating that demand would eventually exceed the newly established policy capacity, the *General Management Plan* further recommended expanding recreational opportunities on the south side of Denali to spread visitor demand to other parts of the park. Development intentions in this currently little-used area include lodging, services, and provision of access to major features, viewpoints, and activity areas, all provided through coordination at a visitor activity center located at Curry Ridge in Denali State Park. South-side development planning began with a five-year memorandum of understanding signed by the National Park Service and the State of Alaska in 1984 (*166*). Planning for this project has far exceeded the initial five-year agreement of the mid-1980s. The February 1997 *Development Concept Plan · South Side* refines the vision of the 1980s to indicate that lodging, restaurants, and other primarily commercial businesses should not exist on either state or national park lands, and the government will protect the wild character of all government lands (*168*). This document proposes developing visitor facilities and services throughout the south side and at an intersection with the George Parks Highway where visitors would turn to reach the new access point (Figure E-8). Discussions of these plans continued into the new millennium.

While the National Park Service has pursued south side development concepts in conjunction with Denali State Park, the public has discussed ideas for a different access point. North of the current park entrance, right of way previously existed between Healy to Kantishna (Figure E-9). Local stakeholders, particularly people with an interest in expanding access from points to the north (including Fairbanks), have begun a public discussion of re-constructing and opening that road alignment (*169*). Alaskan Senator Murkowski from Fairbanks helped arrange for the National Park Service to reprogram

$372,000 to study the northern access route. The 1986 *General Management Plan* acknowledges that Revised Statute 2477 (formally codified 43 USC932 when it was enacted in 1866) stated that "the right of way for the construction of highways over public lands, not reserved for public uses, is hereby granted." On October 21, 1976, PL 94-579 repealed the 1866 statute, but existing claims remained valid. The General Management Plan indicates that either the Alaska Department of Transportation and Public Facilities or the Alaska Department of Natural Resources have potential, though not established, claims on right-of-way between Healy and Kantishna. The public commonly refers to the Stampede Trail as a potential alignment for creating a circle road from the current park entrance through Kantishna and back to Healy. The National Park Service does not favor this alignment because it crosses wolf denning areas, caribou ranges, and pristine country (*166*).



Figure E-8: The National Park Service is considering developing a southern area as a second major park entrance.

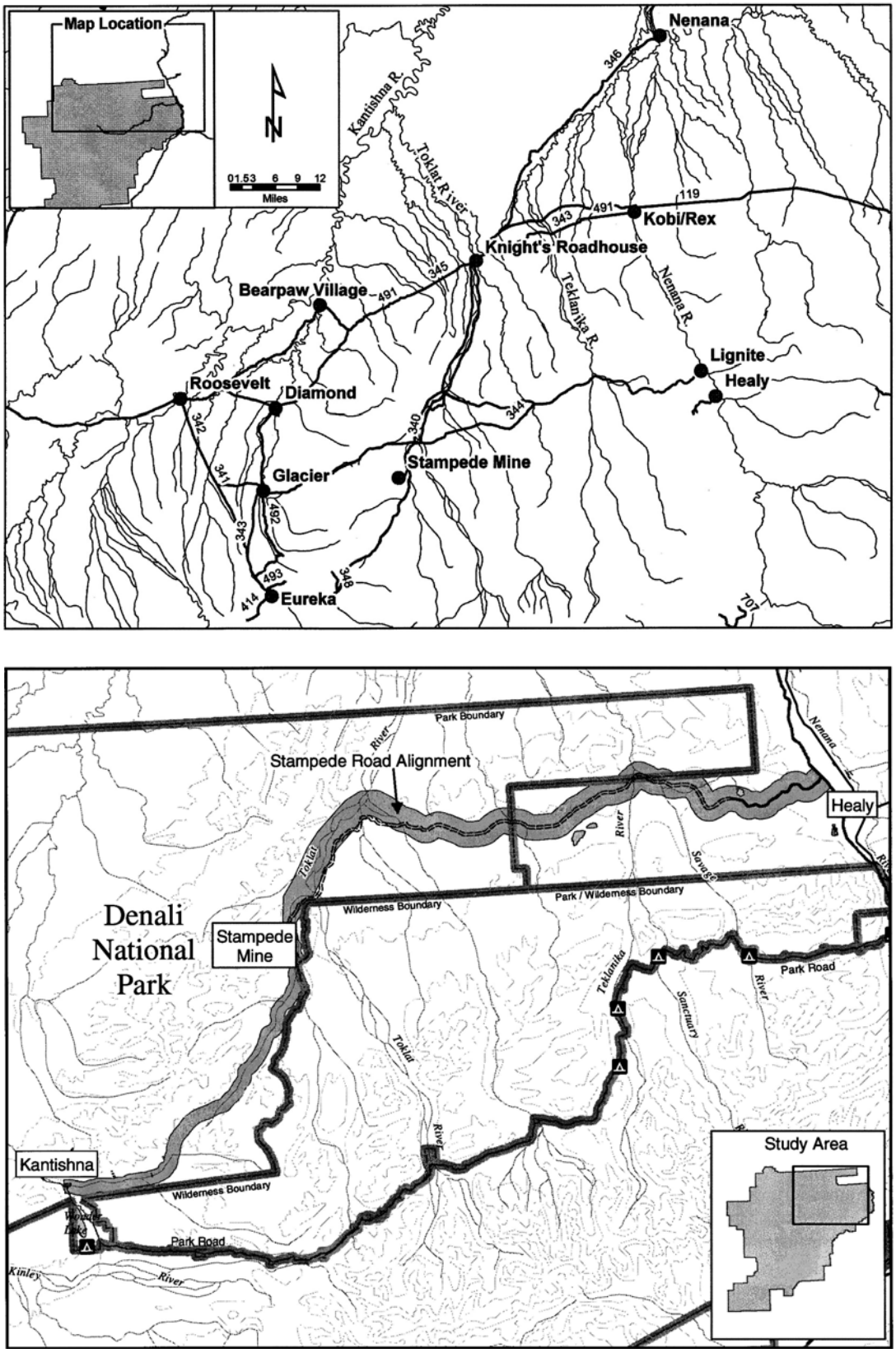


Figure E-9: Former mining-town right-of-way (top) has entered modern dialog about a potential second park entrance on the Stampede Road Alignment (bottom).



Figure E-10: Denali recently constructed a traffic circle to handle volumes of traffic for multiple directions.

In recent years, Denali has expanded infrastructure capacity near the entrance to the park with the objective of providing resource-based experiences in the entrance area and a science and learning center. Beyond visitor facilities, construction has included a traffic circle to handle vehicles from the park entrance, the future visitor center, the future science and learning center, the train depot, and the park road (Figure E-10), as well as other means of improving vehicle and pedestrian circulation (*170*).

At the end of the park road in the innermost part of the park accessible by vehicle (an eleven-hour round trip on the shuttle from the visitor center), the transit system serves a developed area of privately-owned lodges at Kantishna (Figure E-11). Several inholders control land in these areas, and they have developed four primary lodges. With private

vehicle restrictions on the access road, guests must make transportation arrangements to arrive at these lodges.



Figure E-11: Deep within the park at Kantishna, private inholders run lodges.

E.2.2 The Gateway Community: Denali Borough, Alaska

In practical economic terms, gateway communities in the area emerged after the formation of the park, the construction of the George Parks Highway, and the advent of transit in the national park. Denali Borough formed itself in the mid-1990s to avoid getting incorporated elsewhere. With the origin of the borough rooted in avoiding having another borough's government imposed on the residents, the political leaders of Denali Borough work from a philosophy geared toward minimal government. Rather than offering a mission statement, the comprehensive plan that Denali Borough adopted puts forth a bill of rights guaranteeing support for "the right of residents to be free from interference in their chosen lifestyle," among other rights (*171*).

Population figures in the area reflect this spirit of independence. With a population of 1,893 in 2000 in Denali Borough, land area shows an average of 6.7 square miles (16.5 square kilometers) per person (Table E-1). Even Healy, the highest population area near the park, has only 22 residents per square mile (8.5 residents per square kilometer).

Table E-1: Community Characteristics in the 2000 Census and Change from 1990

	Healy	Cantwell	Denali Borough[15]	Alaska	United States
Population	984 99%	244 +68%	1,893 N/A	626,932 +14%	281,421,906 +13%
Median Household Income	$60,000 +7%	$43,750 -1%	$53,654 N/A	$51,571 +25%	$41,944 +40%
Per Capita Income	$28,225 +55%	$22,615 12%	$26,251 N/A	$22,660 +29%	$21,587 +50%
Population below Poverty	4.9% +1.0 pt	2.0% -8.3 pt	7.9% N/A	9.4% +0.4 pt	12.4% -0.7 pt
Land Area in Square Miles (Square Kilometers)	44.7 (115.9)	43.7 (113.3)	12,750 (33,086)	570,373.6 (1,477,267.5)	3,537,438.4 (9,159,116.1)

Economically, Alaska does well relative to the rest of the country (Table E-1), and the oil industry partially explains why Alaskan residents fare roughly $10,000 better annually. Since 1982, the Permanent Fund Dividend Program has distributed annual checks of various amounts (Figure E-12) to Alaskan residents for living in the state to provide a population base necessary for oil drilling. The money comes from a constitutionally-mandated collection and investment of "at least 25 percent of all mineral lease rentals, royalties, royalty sales proceeds, federal mineral revenue-sharing payments and bonuses received by the state."

Specifically in the region around Denali, residents range in income from Healy residents and households earning far more than state levels to Cantwell households earning far less than the state median household income (though still $1,806 more than the median household in the United States… an amount roughly equivalent to the Permanent Fund Dividend check at the time). Census data from 1990 and 2000 indicate a

[15] Denali Borough did not exist as a political entity at the time of the 1990 United States Census; therefore, data do not exist to provide information on demographic trends.

drastic 8.3-point reduction in poverty for Cantwell, but the small population of the area makes this improvement appear unusually impressive. The figure reflects a drop from fifteen residents living below poverty to five while population increased by 99 residents. Reducing population below poverty by ten people would not create such an impressive-looking point reduction in a community with a larger population.

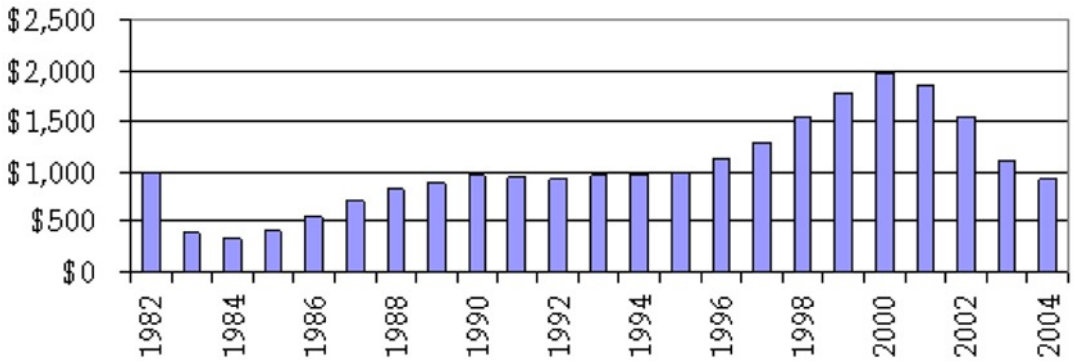


Figure E-12: Alaska's Permanent Fund Dividend Program pays state residents dividends annually (*172*).

In general, analysis has identified Denali Borough's economic opportunity lies in two areas. The borough can increase money brought from outside the region by expanding tourism and mining. To keep existing money in the area, local leaders have identified need for attracting banking, legal services, and real estate (*173*).

Without an official city or town designation, the developed area in between Healy and Cantwell on George Parks Highway and directly outside the entrance to Denali National Park centers itself entirely on the tourism industry. This area, located in Nenana Canyon, has taken the nickname, "Glitter Gulch," although some local residents consider the term

derogatory in its inaccurate implication of the bright lights of Las Vegas. The canyon rapidly developed in the nineties and the early part of the new millennium. Whereas most small gateway communities grow along road corridors and local leaders cannot imagine anything other than access solely by private vehicle, commercial development in the canyon has demonstrated that complete gateway communities can emerge where half of all tourists travel without private vehicles. The development in the gulch differs somewhat from development in other gateway communities. Local businesses provide private shuttle services to the train depot and the park visitor center. With people accessing local resources only on foot or by bus, the transit-dependent tourism base has forced businesses to cluster close to each other, making business location perhaps even more economically important than in auto-oriented communities. Business people consider this canyon so lucrative that they have developed all available land (Figure E-13). In the last two years, one lodge alone expanded from 150 rooms to 430, and just when locals believed no further development could fit in the space, another lodge appeared up the hill in a topographically unlikely place. Development up the hill has required stripping the mountain and establishing soil retention, which occurred in close proximity to the internationally treasured ecosystem of Denali National Park and Preserve (Figure E-14).

Although Glitter Gulch emerged without a premeditated public process, it bears the earmarks of what community planners call transit-oriented development. Transit-oriented development occurs where people can satisfy many of their needs on foot, and buses, trains, or other forms of transit can take them to remote destinations without need for a private vehicle. Glitter Gulch's development in Nenana Canyon has the unusual

characteristic of a major highway bisecting the transit-oriented community, but shops, restaurants, hotels, and tourist services all sit within walking distance of each other, half of the visiting population has no private vehicle in the area, and people commonly access major destinations in the park by bus.



Figure E-13: Tourism-oriented businesses developed in the nearby canyon.



Figure E-14: Development up the hill requires retaining walls on access roads.

E.3 Denali Shuttle Service

E.3.1 Current Conditions

Several bus services run various distances along the 90-mile park road in a 111-day season. Color indicates whether a bus serves for tours or transit (Figure E-15). Visitors

on tan buses pay a premium for tour service, which includes interpretation and lunch on long tours. The sled dog demonstration tour has gained prominence as one of the park's most popular attractions. Visitors who want basic transit service, which Denali calls Visitor Transportation Service (VTS), ride on green buses. Visitors need to provide their own food if they take long rides on green buses. Ticket prices ranged up to $35.75 for round trip transit to Kantishna in 2003; the park entrance fee of five dollars is hidden in that cost. Green 28-passenger buses with extra space for luggage serve as camper-VTS, which operates similarly to the regular VTS, except camper service is intended to provide transportation specifically to take people into and out of the wilderness for multi-day excursion. Diesel 52-passenger (44-passenger with wheelchair accessibility) school buses serve as both transit and tour vehicles because typical tour coaches cannot negotiate the road topography.



Figure E-15: Denali uses school buses for their ability to navigate local terrain: green for shuttle and tan for tour.

The buses travel various lengths of the park road, which has no branches (Figure E-16). Buses simply travel in and out of the park on the single road, stopping at campgrounds, viewpoints, and locations of visitor facilities. The bus route has several fixed stops, but hikers and campers can request a stop anywhere along the route and flag buses for return transportation. The longest bus route takes people from the transportation center at the park entrance to Kantishna, which requires an eleven-hour round trip.

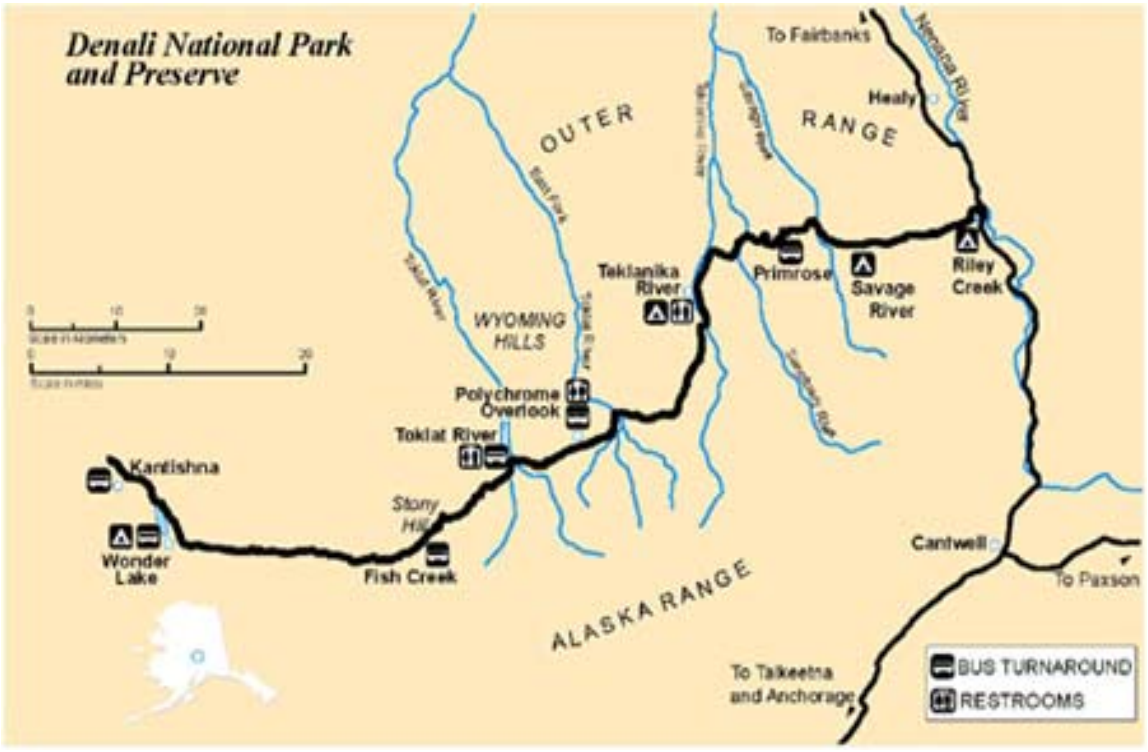


Figure E-16: The shuttle route traverses the entire park road from Riley Creek to Kantishna.

The popularity of Nenana Canyon for business owners and tourists has resulted in some unfortunate consequences. The development's location spanning the George Parks

Highway has mixed a high-speed automobile right of way with pedestrian activity, and the area earned a reputation for pedestrian fatalities. The Alaska Department of Transportation has worked with local leaders to implement the Nenana Canyon Safety and Access Improvement Project to create pedestrian and bicycle facilities (including a pedestrian bridge from the commercial area into Denali National Park and Preserve, such that pedestrians do not need to walk along the highway) and to implement new traffic controls. As the first step, speed limits on the George Parks Highway dropped from rural highway speeds of 65 miles per hour (105 kilometers per hour) to levels more appropriate to a commercial area at 45 miles per hour (72 kilometers per hour).

One concessioner, the Doyon-Aramark joint venture of a Native American corporation with a major national concession contractor, has operated both tour and transit services since 1995. Concession liaisons on the National Park Service staff work with the concessioner on transit operations. In keeping with the concept of centralized information and operations, Denali's shuttle operator publishes no schedules for public distribution, so visitors must call or appear in person to learn preliminary information needed for trip planning. Denali's transit operator limits access to shuttle information on purpose to avoid confusion with the different bus schedules used at different times of the year.[16] Denali has faced a situation where local business owners perceive that the concessioner will push visitors to choose a more expensive bus tour when they call for telephone reservations. The concessioner says it addresses this concern by offering

[16] Since the time of the site visit, Doyon-Aramark has begun listing schedules on the Internet and taking online reservations with links to the corporate partner provided from the website for Denali National Park and Preserve.
http://www.nps.gov/dena/home/visitorinfo/bus/index.html

different telephone numbers for the shuttle and tour reservations, but the local businesses either do not know about this precaution, or they do not consider it effective. The concessioner could gain more support from local businesses through better communication about the reservation system. Based on experience arranging the Denali site visit for this research, reservations operators do not ask if customers already have passes covering park entrance fees. Visitors must volunteer that they have a national pass, or they will double pay for entrance fee in the ticket cost.



Figure E-17: With private vehicle restrictions, long stretches of road see only buses.

Denali uses a controlled system for moving people through the park. The private vehicle restrictions on the park road channel almost all visitors onto buses, and visitors make reservations to ride buses. Frequency does not matter as much as on buses without reservation systems because people do not think in terms of riding any bus that arrives. Although some destinations have high capacity and probably have room for people who

choose to travel at the last minute, remote destinations like Kantishna might not be available for people to reach on a whim. The concessioner reports that most people can get a ticket to a destination of choice within a day or two, but for people visiting the area for a half day or day, such delays eliminate the opportunity to visit the attraction. The tight restrictions lead to a situation where visitors only occasionally see other vehicles on the park road (Figure E-17).



Figure E-18: The transportation center centralizes parking, ticketing, and loading.

With the tight control and coordination come centralized operations. Denali opened a transportation center near the park entrance, which has also doubled as a visitor center in the interim until construction of a new visitor center. Visitors can park in front of the transportation (if they have private vehicles), view schedules and read about offerings,

purchase tickets at an often crowded ticket counter, and board buses at the back of the building (Figure E-18). Denali is constructing a new visitor center between the transportation center and the railroad depot. This new visitor center will leave the existing facility to its original purpose as a transportation center. Deep inside the park, the Eielson Visitor Center coordinates passengers who are primarily trying to secure a seat on a bus to return to the park entrance (Figure E-19). All of these facilities have dedicated staff to manage often substantial crowds of visitors.



Figure E-19: Eielson Visitor Center coordinates passengers and buses from the middle of the park.

Denali also provides bus infrastructure as an amenity for visitors at smaller, but still important, locations. Near the park entrance, a campground provides infrastructure at its bus stop to identify where campers should wait and to offer information (Figure E-20). Interim infrastructure exists at fixed bus stops along the park road. Drivers make longer stops at locations like Polychrome Point, where visitors can use restrooms and stretch their legs on a short loop trail (Figure E-21). Other than the infrastructure at fixed bus stops, most of the park road remains unaltered by further development, just as the park has few designated and improved trails.



Figure E-20: Denali provides infrastructure and information for campers.



Figure E-21: Polychrome Point offers a bus rest area with amenities and a short walk trail.

Transit does not serve the airport in Healy, although the bus does reach the airport in Kantishna. Both airports serve only small planes and general aviation traffic (Figure E-4 and Figure E-22). With the bus reaching the airport in Kantishna, visitors can switch between transit and chartered air service for transportation in and out of the park.



Figure E-22: The local airport in Healy handles general aviation traffic.

Just as Denali acted as an early adopter of recreational transit, park administration now has set its sights on innovative application of technology and intelligent transportation systems (ITS). Denali has plans to fix cameras on wolf dens, eagle nests, and other unique areas of ecological intrigue, such that a bus arriving near a targeted area will respond to a sensor and broadcast the camera feed onto a monitor in tour buses. Denali's shuttle operator hopes that the use of technology on tour buses will lure visitors away from shuttle buses onto the more expensive tours. Private enterprise sees potential to make economic gains based on the niche of technology integrated into local transportation.

E.3.2 History: Goals and Lessons

Denali National Park administration proactively stemmed impact on the park from increased private vehicle access by implementing private vehicle restrictions and instituting bus service with the opening of the George Parks Highway in 1972. This move did not solve the problem of rising impact from increased interest in visiting the park. After Alaska opened the highway between Anchorage and Fairbanks in 1972, the Denali transit system only needed to handle 88,625 visitors in 1972. Visitation grew to

251,105 in 1979. A 1984 study concluded that increasing use of the road into the park had pushed moose and bears away from the road, and the study raised concern that migratory patterns might change if vehicle spacing became too short (*174*). In an effort to control use of the existing park road, the 1986 *General Management Plan* established policy to reduce traffic in the park in three stages. First, Denali would limit bus traffic to the monthly averages experienced in 1984 plus fifteen percent, and private vehicle use by employees, campers, and professional photographers would decrease (Table E-2). In a second stage, no private vehicles would access campgrounds beyond Savage River (the current private vehicle checkpoint depicted in Figure E-7). By stage three, Denali could raise the number of shuttle and tour buses allowed to 120 percent of 1984 levels, based on overall traffic reductions achieved through decreased private vehicle use. The staged plan would decrease traffic by a net total of seventeen percent. Notably, the *General Management Plan* cited 1984 visitation of 394,426 and an expectation of another 250,000 annual visitors within ten years (*166*). With 2003 visitation at 360,188, concerns of park demand have fallen markedly short of the projected scenario that would spur the development of a second park entrance.

Table E-2: Proposed Changes in Traffic Levels (*166*)

	1984	**Use at Full Plan Implementation**	**Net Change**
Tour and shuttle buses	4,245	5,094	+20%
Private vehicles	6,662	3,664	-45%
National Park Service vehicles	1,754	1,754	0%
Total Traffic	**12,661**	**10,512**	**-17%**

With the exception of rare occasions when park access has been opened to private vehicles, internal park roads have never seen traffic congestion, and because demand at Denali has not yet exceeded the cap specified in the 1986 *General Management Plan*, no one has yet tested the policy. In anticipation of growing demand, stakeholders in the park are considering alternatives for capacity expansion, such as changing the allotments of vehicle trips (fewer trips allocated to professional photographers to allow more trips by transit) or adding the new access roads from the north or the south.

Although Denali has successfully managed internal traffic, changes in visitation and access to the region have brought traffic to areas just beyond the primary shuttle routes, and transportation planners and engineers are working to solve major problems on the outskirts of the park. As mentioned, , a number of pedestrian fatalities outside the park where commercial development has concentrated prompted the Alaska Department of Transportation to launch the Nenana Canyon Safety and Access Improvement Project. The plan will pedestrianize the area, including building a foot bridge over the river to create direct pedestrian access to the bus depot in the park without forcing people to walk along the major thoroughfare. One could argue that until such car-free access and amenity are achieved, the transit system has displaced and changed the nature of traffic problems, rather than eliminated them.

E.4 Impacts

E.4.1 External Influences

A variety of factors influence changes in the tourism industry. At a fundamental level, tourism communities must accept the significant effects of basic factors, such as weather and wildfires. Nearby tourism venues with big events might have minor or

major impacts, and these impacts could compliment or compete with park attractions, depending on how tourists plan their time.

Two important external factors affected the overall American tourism industry late in 2001: the economic recession and the terrorist attacks of September 11th. Industry experts cite increasing and decreasing influences on tourism since the attacks. People might be staying home for fear of terrorism or to save money. On the other hand, perhaps they spend less money on vacations by driving to parks than tourists would spend if they were to travel far from home. Although foreign visitation to national parks has declined, Americans are traveling domestically and identifying with national treasures.

Many cruise ship destinations, such as Denali with half of its visitors arriving on cruise ship excursions, have seen the effects of the Norwalk virus on tourism, and interviewees reported that local appearance of the virus precipitated measures for protecting the health of tourists and local workers, such as the widespread installation of sanitary wash dispensers. Apparently, local workers have dealt quietly with their own bouts of illness because they economically rely on tourists and would rather deal with tourism-related illness than with a lack of tourists. Because cruise ships operate under a competitive private sector system, the operators do not readily provide data on passenger demand; however, as an international cruise ship destination, Denali might have seen a decrease in cruise ship passenger traffic due to fears of the virus.

The Severe Acute Respiratory Syndrome (SARS) coronavirus could also have created a negative effect on tourism, particularly for western national parks. Fears of this virus reduced travel between Asia and the United States, thereby reducing the number of Asian travelers who constitute a substantial portion of foreign visitation in many western parks.

In general, Alaska tourism has felt strong impacts from global forces in recent years. With Americans staying closer to home and people traveling globally at reduced levels, Alaska's remote location has made it particularly susceptible to the shock to the tourism industry. From Alaska's interior, 87 percent of respondents in a 2003 visitor industry survey reported a significant decline in business volume. At that time, Alaska had received 30,000 more cruise line passengers than in the previous year; however, many of those new passengers came as a result of deep discounting, and these passengers did not take land-based excursions into Alaska's interior. Additionally, the State of Alaska contributes less than most states to bolster its tourism industry, spending eighteen percent less than the average state spends on tourism marketing and allocating no emergency marketing funds in the wake of recent global events when several other states created emergency budgets between $2 million and $29 million (*175*).

E.4.2 Shuttle Impact

Overall opinion in the local area appeared to support the necessity of the bus system in the park. Stakeholders expressed that they felt the buses run smoothly. People had differing ideas on the management of information, fares, and driver wages, but notably, the community appeared to accept the multi-decade presence of transit as an inherent part of local culture.

E.4.2.1 Employment

With three decades of transit operations in the park, Denali also has a loyal staff of mechanics and 130 drivers, some with equally long tenure. These people have made a career of serving the bus system and sharing their intimate knowledge of the park with

visitors. In that sense, Denali has gained strong advantages from the longevity of its staff; however, government wages were not sustainable in perpetuity.

For operational staff, Denali maintained federal wage rates for over two decades before deciding that it needed to streamline its cost structure. The shift from government to contract operations was meant to bring some market efficiencies into the offering of transit service; however, those market efficiencies included wage rates for drivers and mechanics. When the shuttle went to private service, the wage rate fell, such that drivers starting employment in 1999 earned $13.25 per hour, and ten-year employees earned $20.75 per hour. These wages reportedly reflect a five-dollar per hour decrease from the policies of the previous management. The resulting driver discontent led to the 1997 emergence of the Denali National Park Professional Drivers Association, a Teamsters union for transit employees at Denali. Relations between management and the union remain somewhat contentious.

E.4.2.2 Visitation Patterns

Business people in gateway communities worry about a primary question related to transit: do people stop coming to parks when transit is introduced? If the number of visitors declines, then the number of people spending money in local businesses declines and the local economy suffers. Similarly, if transit causes an increase in visitation, an upswing in the local economy would likely occur.

With almost all visitors to Denali accessing the park by bus, Denali National Park calculates its visitation primarily based on bus ridership. Special private vehicle permits, aircraft permits, mountain climbers, and bicyclists also factor into the visitation

calculation (*176*). Denali's visitor methodology for counting visitors has remained stable for a number of years, which allows comparison of visitation levels trends over time.

Denali has displayed fluctuating levels of visitation in recent years (Figure E-23). The park experienced a thirteen-percent increase in visitors in the late 1990s, but in 2000, that increase dropped by 50 percent, bringing the number of visitors back to only seven percent higher than 1996 levels. Denali visitation looks surprisingly strong in 2003 in consideration of the state tourism industry analysis that indicated a substantial decrease in visitors traveling into the state's interior at the time. Increases in visitation in other parks in the Alaska Region must be viewed in perspective of size and location. Because all other parks in the region have lower visitation than Denali, a shift in travel patterns from Alaska's interior to parks along the coast will appear as a relatively large percentage increase for the Alaska Region in 2002 and 2003.

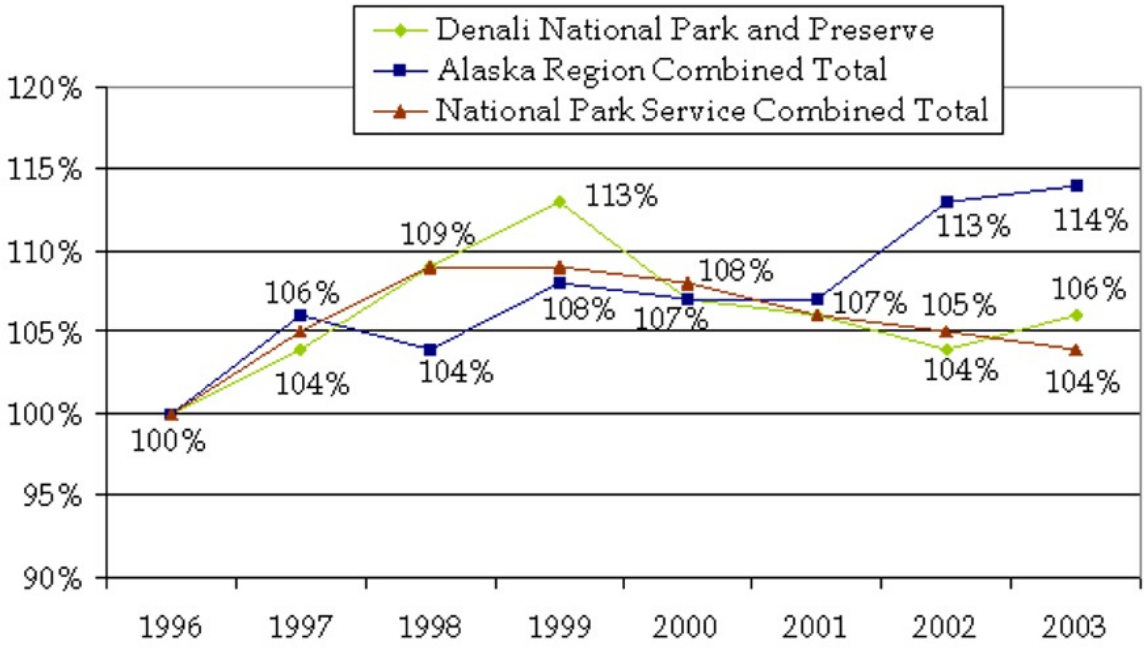


Figure E-23: Park and regional visitation relative to 1996 levels.

Environmental consequences of the shuttle system can be expected to have a long-term impact on visitation that will be difficult to isolate. Clean air improves the quality of the visitor experience. Alaska does not face the same types of air quality problems from auto emissions that most of the rest of the country faces. The bus system might have contributed to the clean air that stays with Denali because public transit has made it possible for half of its visitors to arrive without private vehicles. The buses themselves operate on low-sulphur diesel with particulate filters on the buses. These measures reduce emissions by 75 percent.



Figure E-24: Visitors on buses get close and safe wildlife viewing.

Stakeholders commonly attributed another environmental consequence of transit on visitor experience that has shaped the reputation of Denali. Several interviewees reported

that the reduced traffic associated with private vehicle restrictions make the road less intimidating to wildlife. Although no formal studies of wildlife sightings have been conducted to compare the effect of traffic levels, people consistently express that wildlife comes closer to the road with fewer cars. Locals say animals feel familiar now with the buses and sense no danger coming close to them (Figure E-24). As a result, park visitors likely see more wildlife than they would see from private vehicles in crowded traffic.

E.4.2.3 Ridership

Ridership on the green transit buses has declined in recent years from a peak in 1999 of 89,892 to 76,757 in 2003, which represents a drop of 14.6 percent over five years (Figure E-25). The camper shuttle experienced a 16.6 percent decrease in the same years. Such decreases seem unlikely in a mature system like Denali's, particularly in light of the slightly decreased visitation over the same period from 386,866 to 360,188 (only a 6.9-percent decrease). With most every bus rider buying a ticket, Denali National Park has transaction records to provide some of the most accurate ridership numbers of any park in the national park system. Even so, administrators did not provide detailed data on ridership when requested for this research. Given only annual data, variation through seasons cannot be analyzed.

Juxtaposing ridership and visitation for the public transit systems in Denali, 2003 stands out as a particularly poor year for ridership (Figure E-26). All other years nearly follow a linear model for how many transit riders Denali could expect given a certain level of visitation. What happened in 2003? The site visit for this research took place in 2003, and people not affiliated with the transit system said that with one operator for the transit and tour services, the concessioner encouraged people toward the more lucrative

tour service. When asked, people close to reservations operations discounted such assertions, stating that visitors dial different telephone numbers to make reservations for tours and shuttles.

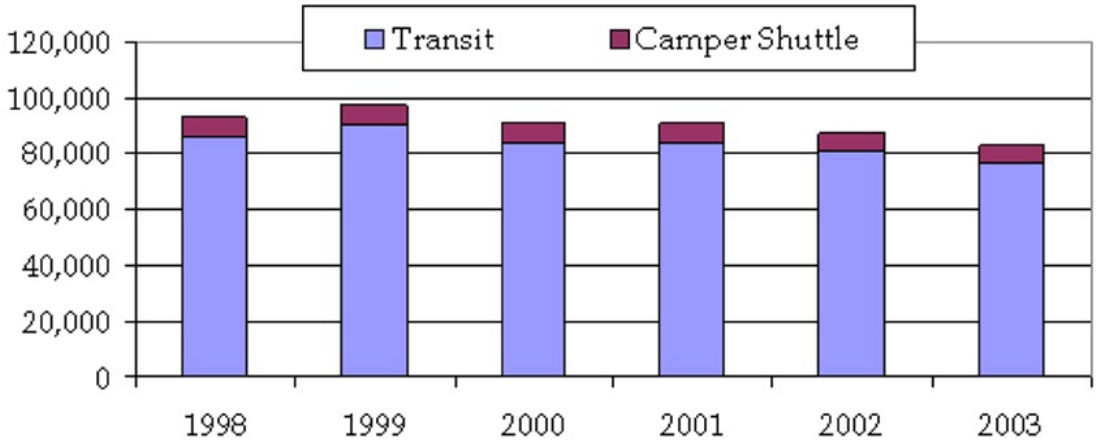


Figure E-25: Annual ridership on Denali's transit buses and the camper shuttle

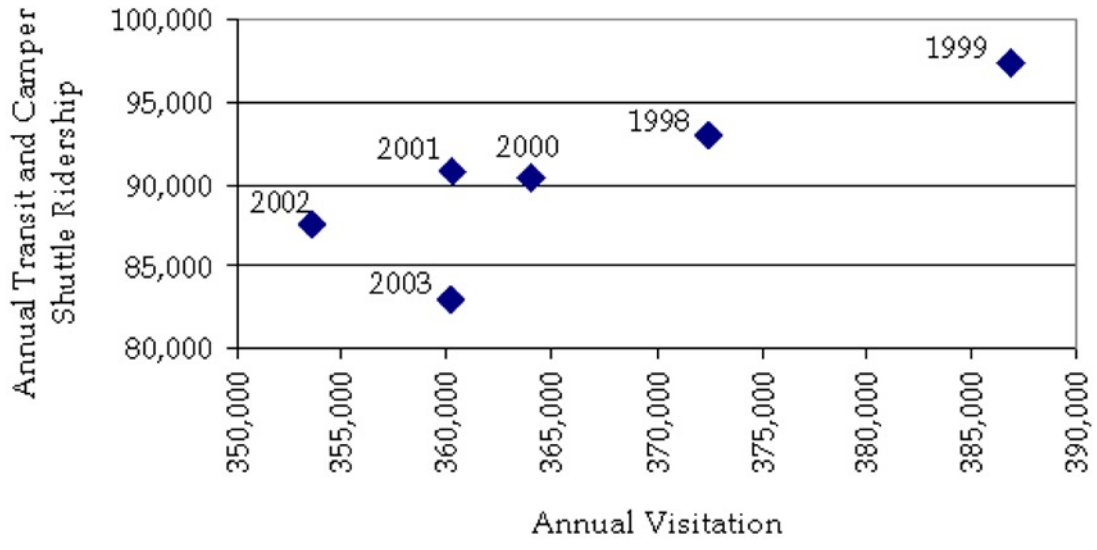


Figure E-26: Annual combined ridership (green transit buses and the camper shuttle) compared to visitation.

In terms of the composition of riders, the shuttle system in Denali appears to serve primarily visitors. Park and concessioner employees ride the shuttle to move between locations in the park, but the location entirely within the park makes it unlikely that riders use it for shopping, dining, or other trip purposes. Buses stop near an employee housing area; therefore, some people would ride to commute to work, but recreational visitors make up the majority of riders.

E.4.2.4 Parking

While most national parks face some of their greatest transportation challenges in meeting parking demand, Denali has always focused more on concerns of the way that traffic impacts wildlife. With half of the visitors to the area arriving by train, Denali has an advantage unique in the national park system: relatively minor parking problems. The park does include large parking facilities near the visitor center and campgrounds where most people arriving by private vehicle would leave their vehicles to change modes to the shuttle bus to travel into the park. Nearby overflow facilities accommodate peak season crowds (Figure E-27).



Figure E-27: The transportation depot has overflow parking facilities nearby.

E.4.2.5 Industry Sectors

The clearest example of a business benefiting from transit in Denali comes in the form of transit operations. Doyon-Aramark profits from its contract as concessioner, which means that both a national and a regional company earns financial rewards (Doyon has its headquarters in Fairbanks). Although transit represents a business venture for the concessioner, it should be noted that tour operations provide the profitable side of transportation. Denali stipulated in its contract negotiations that winning the contract to provide concessions in the park meant providing the low-fare transit service as part of the required duties.

Transit in Denali has meant that other businesses have needed to take on transportation expenses. Hotels and lodges hoping to capture rail traffic and the lodges affiliated with cruise lines have needed to create in-house bus service to move guests between lodges, the park, and the railroad station (Figure E-28). Local lodges assume all of the costs of providing their own equipment and shuttle service into the park, and people who do not stay at lodges offering service have no means of taking the bus.



Figure E-28: Large lodges outside the park provide bus transportation for guests.

The heavy use of buses in the area has led to evidence of another industry: the operation, sale, and resale of buses. Laidlaw Education Services maintains a facility and charter operations in Healy, and school buses appear in many places along roadsides either parked and apparently in use, for sale, or in a scavenged state (Figure E-29).



Figure E-29: Evidence of thriving bus commercial operations, sales, and resales appears on local roadsides.

Some small entrepreneurs have found new opportunity for car rentals coming out of the transit-oriented culture of the area. One business owner reported that initial intention to allow seasonal workers access to a spare car for weekend shopping trips grew into a full-fledged rental business as tourists expressed a desire to see more in the area than the national park where the buses would take them. Visitor demand emerges when people realize that the local area has more to offer than the national park and that people can explore the areas outside the park with less restriction (Figure E-30).

Outside of the transportation arena, the central decision-making of transit operations made an evident impact on local retailers during the site visit. On a rainy day, Denali staff reported snow on the park road. A simple snow shower on the unpaved road can

stop all operations for a day. The concessioner cancelled all bus operations. People who had purchased tickets for that day could use the tickets on a day that posed safer conditions (if visitors' schedules allowed them to stay in the area). Instead of venturing into the park, visitors meandered through the shops in Nenana Canyon, and retailers reported heavy activity.



Figure E-30: Local entrepreneurs are filling a niche for car rentals.

On a more predictable basis, the food preparation industry has a market from people anticipating long bus rides. Several businesses offer box lunches for sale because no concessions offer food in the park, despite bus rides that often take a full day.

E.4.2.6 Long Term Costs

In 1972, Denali assumed the long-term cost of transit operations with drivers receiving the federal wage level, regardless of local economic standards, but in the mid-1990s when transit reportedly cost between $2- and $3-million, the Park moved transit operations from in-house to contracted operations to reduce the operational burden. This move eliminated the federal wage standards and brought market forces to bear on labor,

which typically poses the highest expense of transit service, but it raised a level of contention with the long-standing transit staff. Along with these operational concerns, Denali also assumed responsibility to see to building and maintaining infrastructure to support bus operations (Figure E-31).



Figure E-31: Buses require special accommodation inside the park.

The 1972 policy decision of Denali National Park to create a transit culture also created need for private lodge owners to assume transportation costs to move guests without private vehicles between their businesses and access to park attractions via the park transportation center. The lodges that have emerged in the area came to the area

knowing the situation, and they willingly took on the operational, infrastructure, and financial responsibilities associated with the opportunity to serve visitors to Denali.

The 1984 decision to create a cap on the number of buses traveling the park road creates another cost: new road construction. Discussions of a new south entrance and redevelopment along the Stampede Road Alignment derive at least in part from the anticipation that visitor demand will exceed the existing park road's capacity with the established cap on buses. Arguably, both the economic cost and the environmental impact of building new entrances and facilities will exceed the effort that would be required to put more visitors and buses on the existing park road, even if increasing the capacity of the road means widening and paving. The initial North Access study alone has cost $372,000. Beyond initial project costs and capital construction, multiple entrances will require operating funds to staff facilities and to maintain the new infrastructure. If the transit orientation of the current park entrance extends to the newly constructed area, then a second park entrance will require bus facilities, a fueling station, a ticket sales center, operations control, a new fleet of vehicles, and a staff of drivers. Of course, expanding the capacity of the park road would change Denali's visitor experience from the traditional telescoping road, and the cost in terms of visitor experience must enter the discussion. Also, experts in ecology would have to determine the tradeoffs of development in one place versus development in another because undoubtedly, different species would feel impacts in different places and professional judgment would have to weigh the environmental priorities.

E.4.3 Measures Taken

Privatizing transit service and making it part of the concession contract helped to consolidate management of operations and to reduce costs. This move brought concessioner reporting requirements to transit operations, as well as private sector market-oriented efficiencies. As mentioned, these efficiencies, particularly in terms of driver wage reductions, have associated drawbacks, as well.

Another aspect of privatization that helped improve the financial situation with some cost to reputation and general good will came in the form of fares. At the start of bus service, people rode for free, and Denali experienced this problem when it introduced fares after decades of fare-free service. The local population considered passage into the park expensive at $33.75 in 2003 for a round trip to Kantishna, the innermost point on the transit route.

Understanding the reserved bus ticketing curtails the ability of state residents to make unplanned day trips to the park, Denali has attempted to offer different ways for state residents to access the park. Denali opted to allow private vehicles on the park road after the end of peak season and the cessation of seasonal transit service, but in 1989, over 1,600 vehicles arrived at the park on the first Saturday after Labor Day. In 1990, Denali National Park started offering a lottery to give 1,600 private vehicle passes access to its park interior over a four-day weekend in the fall shoulder season (400 vehicles per day). Lottery interest moved beyond the state and out to the world. The chance to win one of the 1,600 access passes available generated 18,500 lottery entries in 2002 from Alaska, the continental United States, and other participants around the world, even though the August lottery drawing leaves only a few weeks to arrange a trip to the area for a

September weekend. Road lottery passes now allow entry from the second Thursday after Labor Day, and only three lottery weekends have had no road closures from snow and adverse driving conditions (*177*).

In the frontcountry, the National Park Service is now actively considering coordinating service between the transportation center, the railroad station, and businesses in Nenana Canyon. With private lodges offering service individually now, multiple buses run essentially the same route at similar times, and buses often run with significantly less than full passenger loads. Visitors not staying at large lodges must have private vehicles or walk to access the park; some bus drivers offer transportation to these people for pedestrian safety, but the service is not advertised. Generally, the lodges currently providing private transit appear to see benefit to coordination to provide consistent and safe service in the area. Buses might have a common community service logo, which could be attached to private buses with a magnetic sign. Even though stakeholders near Denali National Park and Preserve have three decades of experience with transit, many people expressed anxiety over new discussions of creating a unified transit service between the gateway community outside the park and the transportation center. Reaction in the community appears tentative, but interested:

- Large lodges appear willing to talk, even if they do not know exactly how such coordinated service will take form and how the changes would affect existing business operations.
- Small lodges are distrustful of the larger ones.
- Recreational vehicle campgrounds, which exist north and south of the park entrance (Figure E-32), have expressed eager interest in the coordinated service

because their customers would prefer not to have to drive their oversized vehicles into the park.



Figure E-32: Recreational vehicle campgrounds to the north near Healy (left) and to the south in Cantwell (right) offer potential for a community bus system.

The coordination of private transit for the community appears to have significant potential benefit. The overabundance of capacity indicates that capital investment in buses does not pose a problem. In fact, too much money is being spent on redundant operations. Coordinating operations to reduce redundant service would save money for local businesses by taking advantage of economies of scale, and the reduction of redundant service will lower traffic levels and the associated congestion and safety hazards. Consistent transportation throughout the gateway community would also enhance the local image and reputation for the visiting public, which should result in greater interest to visit the area and stay in the area longer.

E.5 Recommendations for Denali Borough and Denali National Park and Preserve

Keep communication open. Denali faces communication problems in several areas right now:

- It faces contentious relations with a transit union full of former park employees with decades of loyalty.
- Gateway community businesses suspect that Doyon-Aramark takes advantage of its position as operator of both transit and tours by pushing people toward tours, even though the concessioner believes that its actions, if they were known, would show otherwise.
- The general public cannot easily access printed information on bus schedules and rates for trip planning.
- Local lodges are trying to analyze motivations and likely outcomes of a movement to coordinate transit in the gateway community.

All of these issues require open communication and an attitude of partnership. If Denali takes a strong-handed position in any of these situations, people will respond with mistrust. The focus in recent years for National Park Service policy has emphasized creating partnerships, and Denali should embrace partnering and open communication as a strategy in all of these relations.

Approach the coordination of a community bus system as a partner, rather than a leader. Coordination of bus service from the gateway community into Denali could provide significant benefit to visitors (who will reap the reward of simplicity), gateway community businesses (which will benefit from economies of scale), and Denali (which will experience reduced traffic and handle less visitor confusion). If the community bus system crystallizes, it will benefit many entities, and each partner will have to make its own sacrifices. Interviewees gave the impression that a heavy-handed approach will breed mistrust. All partners must gather together with a willingness to listen and to

express needs. Based on interviews for this research, serving recreational vehicle campgrounds should take a high priority because this service will bring the reward of high demand and well-received service as an early success for partner efforts.

Consider caps based on Visitor Experience and Resource Protection (VERP) capacity supply, rather than 1984 demand. Park administration had set the cap in the 1986 general management plan against a projected increase above annual visitation at the time. In theory, a cap establishes a threshold of supply: the upper bound of use the park can withstand while reasonably protecting the natural resource and the visitor experience. In practice, the cap was set according to demand at a given time period. In recent years, the National Park Service has taken innovative steps to determine the supply side of the equilibrium of supply and demand with its VERP program. Denali should examine its vehicle caps against VERP methodology as part of its consideration of alternatives for expanding access to the park.

Research the gateway community economic impacts of opening another entrance. Opening a second entrance will create significant costs for both the National Park Service and the recently developed gateway community directly outside the current park entrance in Nenana Canyon. Local stakeholders in the region do not appear alarmed at the prospect because they have an established capacity for handling visitors, but the economic realities of a shorter trip from either Anchorage or Fairbanks to see the same park will almost certainly draw visitors away from the existing gateway communities. Newer facilities and newly dedicated park resources will assist in this pull. The share of interest that the cruise ship industry holds in Denali will have a strong impact. Already, cruise ships typically send people to Denali on half-day packages. Time matters in this

business, and if passengers return to the ship early to spend more time on the ship spending money en route to another port, cruise ship managers must take note. Nenana Canyon has the advantage that major cruise ship lines have recently expanded lodging capacity locally, but by the time that the National Park Service constructs and opens a new entrance, the memory of the cost of these new facilities might not stand so prominently in cruise ship managements' minds as the financial opportunity of cutting a half day from the time needed for land excursions. A single cruise ship line deciding to move its land excursions to a new entrance will have devastating effects on the small local economy around the existing park entrance.

E.6 Possible Implications for All Parks

Denali's long history with public transit gives some indication of how transit in parks can work over time. In recent years, Denali has particularly dealt with lessons of changes in monetary policies. Federal wage rates cut heavily into budgets in communities where market forces would have substantially lower wages, but cutting wages after people have based their entire careers on park transit service breeds ill will. Similarly, introducing service without fares helps to generate ridership and get the public familiar with a transit system, but introducing fares… even deeply subsidized fares… can result in resentment from people unaccustomed to paying.

Denali also offers a strong example of what can happen over time in gateway communities with long-standing experience with transit. Glitter Gulch shows that transit-oriented development can create a strong gateway community economy. The current dialog on coordinating private bus operations between Denali and gateway community

businesses hints at the potential for how gateway communities can mature in their transportation planning.

Denali's experience shows that stakeholders will support private vehicle restrictions in situations where road safety or ecological preservation limitations could not support free flow of traffic, and the strong local belief that restrictions have increased wildlife sightings makes a strong argument for traffic limitations; however, the popularity of the lottery shows that people still cherish freedom of access. Also, the apparently expanding opportunities for experiences in the region outside the park suggests that people might need some outlet where they do not feel directed and controlled. The long distances in Denali makes it particularly difficult for people to get away from the prescribed plan for the generic Denali experience.

The pedestrian fatalities in Nenana Canyon demonstrate that transit system organizers need to consider transportation as a regional system. Transportation is a regional issue that transcends borders. The reduction or elimination of traffic in a park can lead to pedestrian deaths outside the park. Providing for the safety of people where they walk in gateway communities and access transit in parks will help realize the vision of orderly movement through alternative transportation in and around parks. All transportation decisions must consider impacts on the entire regional transportation system.

E.7 Summary

Denali National Park and Preserve pioneered transit service in national parks when it restricted private vehicles on the park road in 1972 before a newly constructed highway first started bringing throngs of vehicles and traffic. With three decades of transit service, Denali has substantial experience in handling the transportation of visitors. In the 1990s,

park administration converted in-house operations to contract operations with its concessioner. The move put both tour and transit operations under one management. Responding to market forces, rather than the federal wage rate, the concessioner substantially cut driver wages, prompting long-serving drivers to unionize under a contentious atmosphere. Changes have occurred outside the park in recent years, as well. A commercial community has developed near the park entrance with services oriented toward a visiting public that arrives without private vehicle transportation. Large lodges provide private bus service for their guests to access the train station and Denali's transportation center. With this development have come associated problems of pedestrian safety and limited resources. Denali is now looking toward handling future growth in visitation in a few ways. First, the National Park Service is actively engaging gateway community leaders in a dialog about coordinating private bus services to provide the equivalent of a public transit service for anyone moving in the community and between the community and the park. Second, in anticipation that visitor demand for access to the park road will surpass an identified capacity limit, Denali is considering creating a second primary entrance to the park. Economically, opening a second entrance will create significant costs for both the National Park Service and the recently developed gateway community directly outside the current park entrance.

(*165*) Fairbanks Daily News-Miner, *Visitors Guide*, Summer 2003.
(*166*) *Denali National Park and Preserve / Alaska General Management Plan*, Land Protection Plan, and Wilderness Suitability Plan, 1986.
(*167*) The National Park Service Organic Act (16 U.S.C. l 2 3, and 4).
(*168*) National Park Service, *Denali, Alaska, Development Concept Plan · South Side*, February 1997.
(*169*) National Park Service and the Alaska Department of Natural Resources, *Draft North Access Visitor Facilities Study*, April 2004.

(*170*) Denali National Park and Preserve, "Environmental Assessment for Construction of New Visitor Facilities in the Entrance Area of Denali National Park," December 2001.
(*171*) *Denali Borough Comprehensive Land Use Plan*, adopted July 9, 1995. Draft revised 1997.
(*172*) Permanent Fund Dividend Division of the State of Alaska web site accessed December 14, 2004. http://www.pfd.state.ak.us/dividendamounts/index.aspx
(*173*) Adams, Leslie C. "Identifying Rural Development Opportunities in the Denali Borough," a master's thesis presented to the faculty of the University of Alaska Fairbanks, December 1997.
(*174*) Singer, F. and Beattie, J. "Wildlife Viewing ad the Mandatory Public Transportation System in Denali National Park," report submitted to the National Park Service Alaska Regional Office, Anchorage, 1984.
(*175*) Alaska Travel Industry Association, "FY04 Marketing Implementation Plan."
(*176*) Denali National Park and Preserve Public Use Counting and Reporting Instructions, January 1, 1997, http://www2.nature.nps.gov/stats/pdf/denaci97.pdf.
(*177*) Denali National Park, "Road Lottery Briefing," internal document intended to consolidate information on the road lottery, undated.

APPENDIX F: CASE STUDY OF HOT SPRINGS NATIONAL PARK AND HOT SPRINGS, ARKANSAS



Figure F-1: Hot Springs National Park.

F.1 Introduction

As the National Park Service advances in its mission to address surface transportation problems in the park system, local communities around parks wonder how changing patterns of visitation will affect them. Examining the effects of transit in parks that recently have introduced transit or have made major changes to existing transit service

can offer potential insights on what gateway communities can expect to result from alternative transportation systems.

The City of Hot Springs has contracted transit for a number of years, but it recently moved operations of tourism-oriented trolley service from a private transit provider to city management with a resident transit advisor. With this change, the trolley, which has traditionally taken people between downtown and a mountain tower in Hot Springs National Park, also added Magic Springs Amusement Park to its route. The trolley provides access to some of the primary recreational destinations in the region, but few agencies and interest groups collaborate on transportation planning for this recreational region, and the case study site visit revealed that persistent problems, such as parking congestion, does not receive coordinated attention from all stakeholder agencies and groups. The Hot Springs site visit took place November 21st through 25th, 2002.

This report comes as part of a larger research project examining the impact of transit at a number of national parks and gateway communities. Field data collection here have contributed to a multiple-case study analysis, in which local stakeholders of various interests (representatives from the towns, parks, and transit operators) were interviewed to determine the overall impact of transit on segments of local communities and on local regions for each of several parks. Information for the case studies comes from a combination of interview results, public documents, direct observation of how the transit system serves the local environment, and archival data on visitation and travel patterns.

This site report does not consider this location's experience with transit in comparison with other similar locations. These analyses appear in the full report. The results of this site report will interest the park and community studied, other parks and communities

entertaining or implementing transit, and the National Park Service, as it continues to develop transit strategies at the national level. This research was made possible in part by a grant from the National Park Foundation through the support of the Ford Motor Company, a Proud Partner of America's National Parks. The National Park Service provided additional funding.

F.2 Background

F.2.1 Hot Springs National Park

Hot Springs National Park sits on 5,500 acres of land integrated within the city of Hot Springs, which has a population of 35,000 people. Both the city and the park exist due to the water flowing from the southwestern slope of Hot Springs Mountain. The park has no entrance stations because it sits alongside the cityscape and people can access the park at numerous locations (Figure F-2). With no formal entrance station, the National Park Service charges no entrance fee for use of the park.

The Midwest region has a small number of large population centers, compared to other regions in the continental United States. Most visitors to Hot Springs National Park arrive to stay for the weekend from homes within a day's drive. With large open spaces and room for parking, the culture of much of the Midwest has evolved without transit. The cultural propensity toward the private vehicle makes a study of the impact of changes to sustained transit service between a park and an associated gateway community particularly interesting.

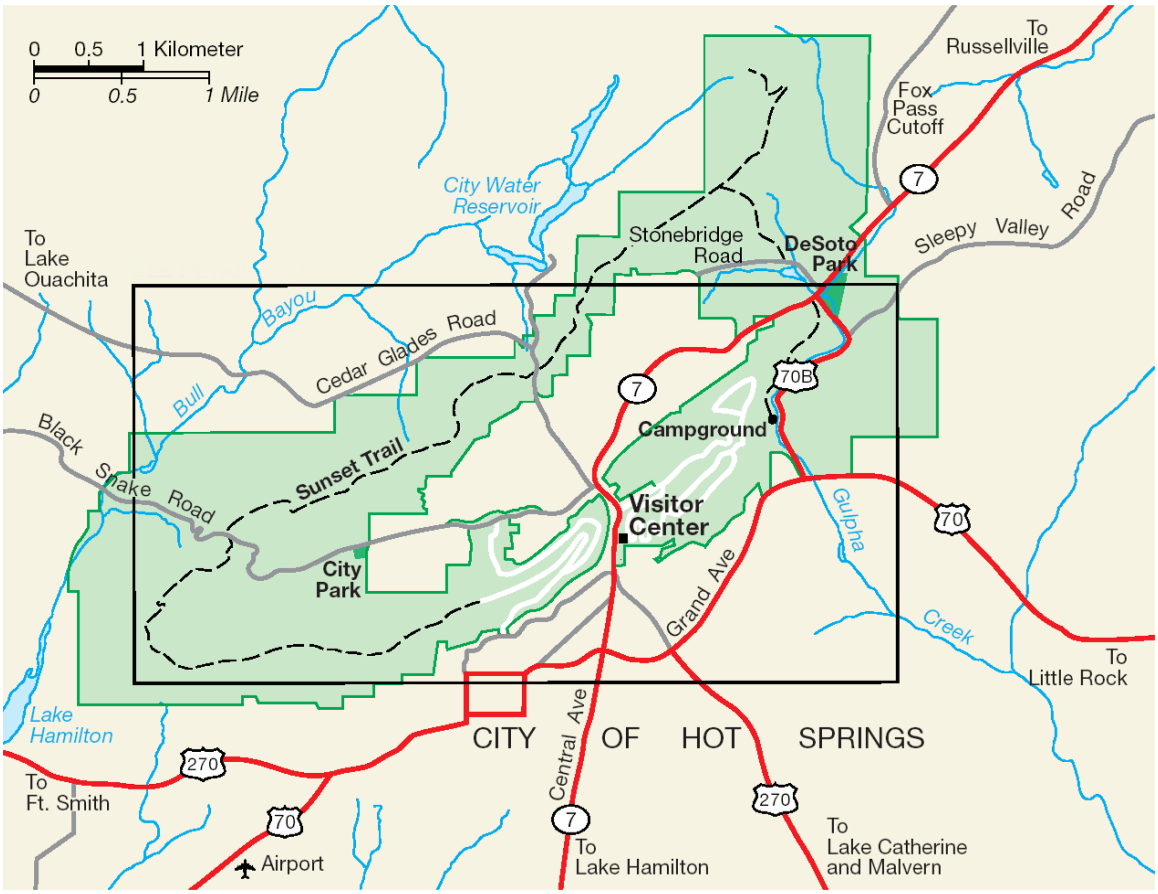


Figure F-2: The official map for Hot Springs National Park shows how park lands and city lands intermix.

The major attraction of the park is the historic Bathhouse Row (Figure F-3). One bathhouse, the Buckstaff, operates as a full-service public bathhouse (Figure F-4), and the Fordyce houses the visitor center for the national park (Figure F-5). All visitor tracking comes from estimates of the number of people who enter that visitor center. The remaining six bathhouses on Bathhouse Row stand vacant on the main strip of the recreational community for lack of funding for renovations and operation. Some serve as storage for the Park Service.



Figure F-3: The National Park Service offers tours and baths in historic bathhouses.



Figure F-4: The Buckstaff functions as the only public bathhouse in the park.



Figure F-5: The National Park Service's visitor center operates in the Fordyce.



Figure F-6: A signature fountain gives access to natural waters at Hot Springs National Park.



Figure F-7: Volunteer donations and labor recently renovated the Grand Promenade above Bathhouse Row.



Figure F-8: The tower at the top of Hot Springs Mountain offers a panoramic view of the city and landscape.

In addition to the bathhouses, Hot Springs National Park also has an improved outdoor fountain where the natural waters flow (Figure F-6), the recently renovated Grand Promenade (Figure F-7), wooded areas, and a viewpoint from a tower at the top of the highest point in the area (Figure F-8).

The road to the mountain tower has switchbacks that make it unnavigable for large vehicles, particularly in the traffic of the high season. The National Park Service prohibits vehicles over thirty feet long, and traffic now flows in only one direction on a loop road (Figure F-9).

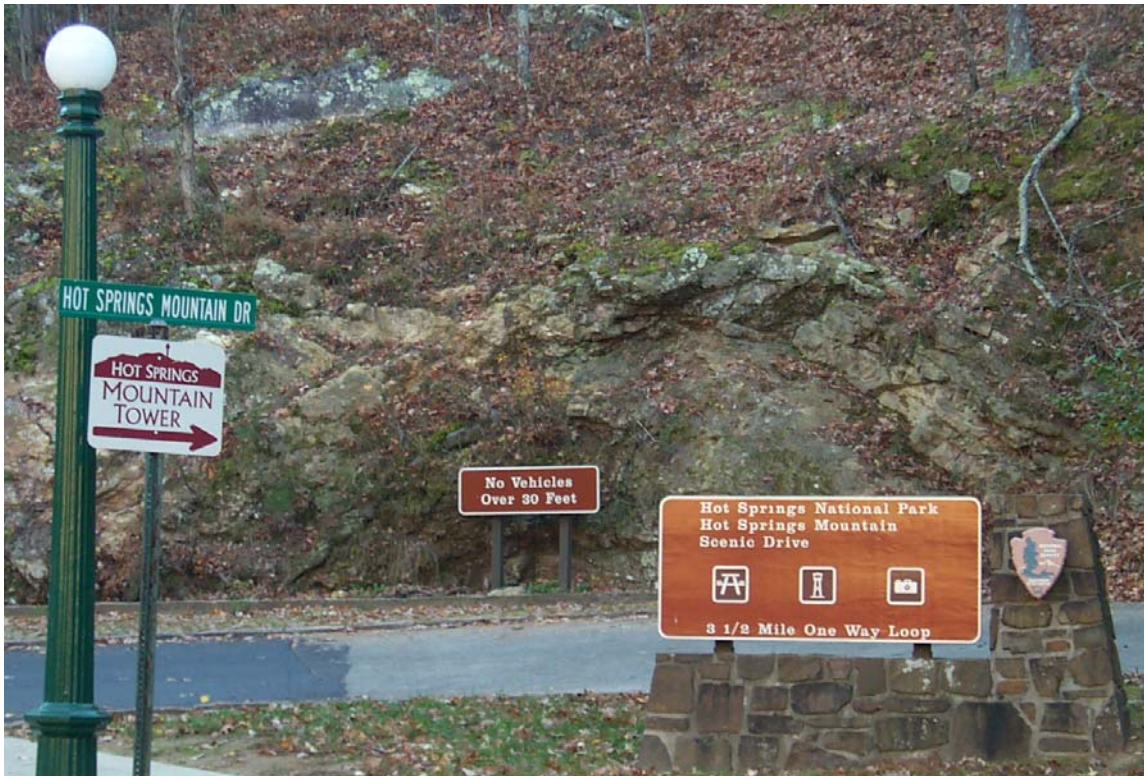


Figure F-9: Hot Springs National Park restricts oversize vehicles and manages traffic flow on Hot Springs Mountain Drive to facilitate traffic flow on the switchback loop road.

F.2.2 The Gateway Community: Hot Springs, Arkansas

The city developed around the lands of the national park. The two jurisdictions intertwine to the point that the main Bathhouse Row and promenade of the park literally sit across the street from the shops of the central downtown area, a hotel, a major rehabilitation center, and the federal building (Figure F-10 and Figure F-11). Between park and private lands, Central Avenue frequently congests with the traffic of the downtown city. The primary development of the city sits to the south of Bathhouse Row (Figure F-2). Government buildings, the convention center, a horse racetrack at Oaklawn Park, and other amenties sit in this area. Further to the south sits recreational lake areas. The city also has some commercial areas to the north of Bathhouse Row. Further to the northeast sits Hot Springs Village, which has grown into an upscale retirement area.



Figure F-10: The streetscape across the street from Hot Springs National Park bustles.

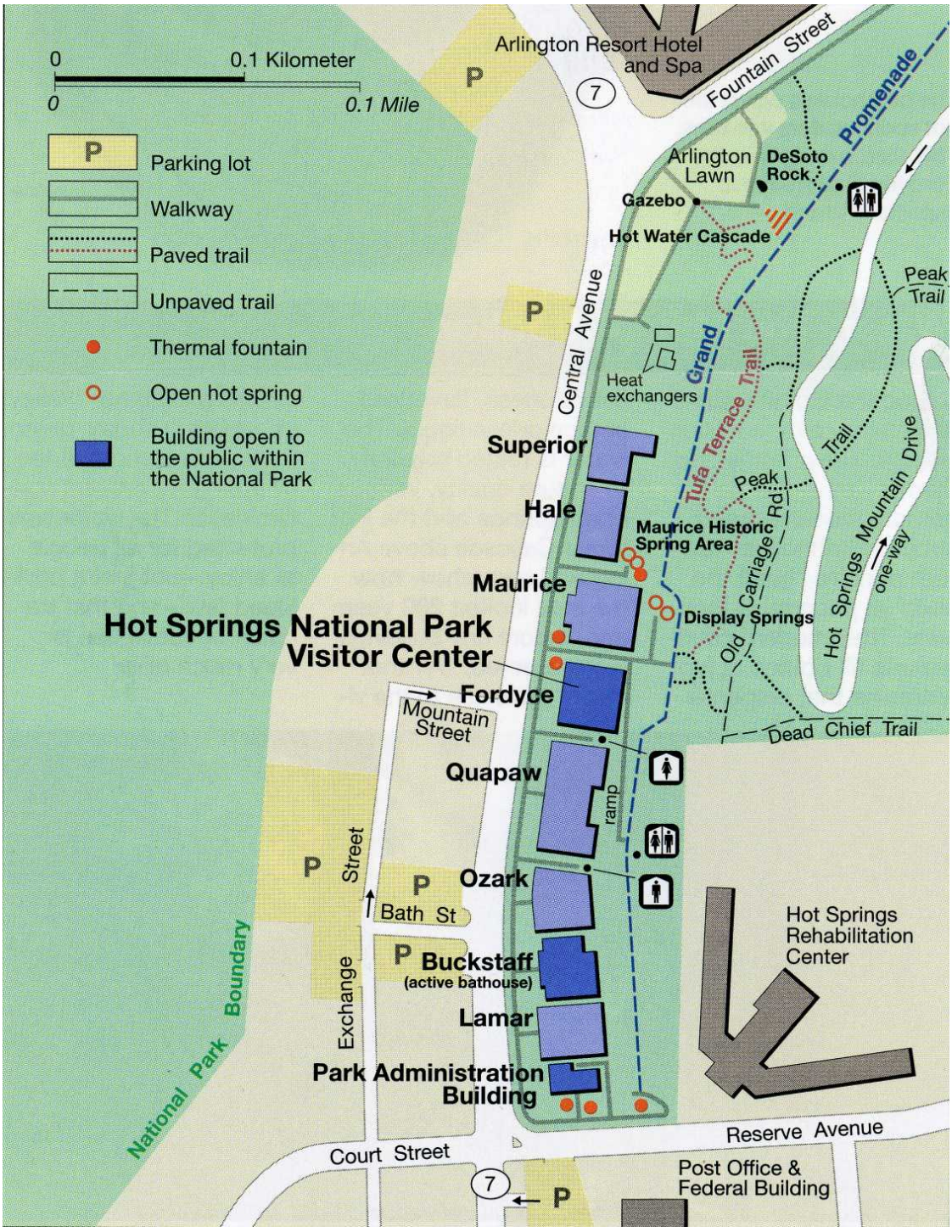


Figure F-11: Bathhouse Row sits on Central Avenue in downtown Hot Springs.

Although the city of Hot Springs had a population of only 35,613 in 2000 (Table F-1), the latest Census brought the region designation as a metropolitan area (which requires a population of greater than 50,000) because the city population combines with Hot Springs Village and surrounding areas to reach the threshold. The metropolitan designation changes the structure of transportation planning in the area with the creation of a metropolitan planning organization (MPO) and the arrival of a professional transportation planner to work with the City and the larger region.

Table F-1: Community Characteristics in the 2000 Census and Change from 1990

	Hot Springs City	Hot Springs Village	Garland County	Arkansas	United States
Population	35,613 +10%	8,472 +31%	88,068 +20%	2,673,400 +14%	281,421,906 +13%
Median Household Income	$26,040 +69%	$41,875 +30%	$31,724 +57%	$32,182 +52%	$41,944 +40%
Per Capita Income	$17,961 +57%	$24,492 +27%	$18,631 +57%	$16,904 +61%	$21,587 +50%
Population below Poverty	19.2% -5.7 pts	2.5% -1.9 pts	14.6% -3.4 pts	15.8% -3.2 pts	12.4% -0.7 pt
Land Area in Square Miles (Square Kilometers)	28.8 (74.7)	38.3 (99.1)	678.1 (1,756.2)	52,075.3 (134,875.1)	3,537,438.4 (9,159,116.1)

Notably, the people of Hot Springs have suffered a period of economic decline, such that the median household income fell 38 percent below the national average in 2000, and 19.2 percent of the population lived below poverty. Despite the low numbers, the figures reflect improvement in Hot Springs between 1990 and 2000 with growth in median household income and per capita income outstripping the national averages, even though

Hot Springs still has a greater poverty rate than the state and surrounding county. Stakeholders reported that Hot Springs experienced its worst economy in the mid-1980s.



Figure F-12: Several empty storefronts intermix with the tourism-oriented businesses of Central Avenue.

Economic development takes a high priority in Hot Springs. The city is emerging from several decades of difficult economic times with a particularly low point in the 1980s, but empty storefronts continue to indicate that the local economy has room for improvement (Figure F-12). Efforts by the local chamber of commerce and various government agencies have succeeded in attracting the Magic Springs theme park, which operates weekends from mid-April and daily from Memorial Day weekend through mid-

August; the autumn weekend schedule lasts through late September. The Arkansas governor projected Magic Springs, which opened in 1999, would bring $180 thousand in annual revenue (*178*). Magic Springs catered to 360,000 visitors in its first year of operations. As part of the deal to attract Magic Springs, the City promised to serve it with the trolley, which could provide transportation for employees and patrons. Hot Springs received further investment in its tourism sector with the development of a $35-million convention center and Embassy Suites Hotel located near Bathhouse Row. The convention center has the largest event capacity in the region. The chamber of commerce also actively pursued and succeeded in helping WalMart locate a new superstore on the outskirts of the city. Interviewees now attribute local success in weathering the recession to economic diversity that local leaders have fostered.

Economic developers in Hot Springs have targeted another economic niche: retirees. With the reputation for healing waters and major medical facilities in the area, agencies market Hot Springs as a place for people to spend their retirement years (and their retirement incomes). This strategy makes sound economic sense for young retirees who have retirement savings and the strength to enjoy them; however, very elderly people require substantial public services. For instance, aging eyes and slowed perception-reaction times make driving unsafe for many elderly. These people require public transportation for basic mobility needs.

The State of Arkansas has taken measures to bolster development of the tourism industry. Arkansas passed the Tourism Development Act (Act 1135) in 1999 to provide incentives that encourage development of tourism facilities that require investment of at least $500,000. The state focus on tourism bodes well for Hot Springs, which

interviewees reported attracts the largest portion of tourism revenue for the state; however, the Tourism Development Act reflects a desire to increase a small part of the economy, rather than strengthen a leading economic contributor in the state. Manufacturing supplies the greatest share (19 percent) of the gross state product. Services and trade are growing in importance, and agriculture has an strong role (*179*).

In terms of transportation planning, goals in Hot Springs relate to land use and development related to local residents. Goals for transit, as stated in the City's 1997 comprehensive plan, reflect a focus on local residents: "Connection to the public transportation system is especially important for low- to moderate-income neighborhoods because they typically have a lower average number of cars per household. In addition to increased ridership, coordinating residential development with the public transportation system reduces traffic congestion and allows for compact development, thus reducing infrastructure costs." Visitor mobility and specific mention of the trolley's role in local circulation does not appear in the comprehensive plan (*180*), and interviewees said they do not consider the trolley a key selling point for tourism.

Hot Springs conducted a survey to determine local perceptions of need. A pedestrian walkway at Oaklawn Park rated the top priority with 75.2 percent of respondents seeing a definite need. The rest of the transportation issues deemed definite needs by at last half of the respondents all related to road and airport improvements. Slightly more than a quarter of the respondents (28.9 percent) saw a definite need for a public awareness campaign for bus service, and only 17.6 percent of respondents put a high priority on bus route expansion (Table F-2).

Table F-2: Hot Springs Citizen Survey Ratings of Transportation Priorities (*180*)

Transportation Issue	Percent Response: "Definitely Needed"
1. Encourage Oaklawn Park to install pedestrian walkway over Central Ave.	75.2
2. Improve traffic flow along Central Ave./Hwy. 7	71.5
3. Continue construction of Martin Luther King from Hwy. 270 to Hwy. 5	63.2
4. Develop alternate routes through the area for heavy truck traffic	62.0
5. Improve traffic flow on Hwy. 70 through the City	54.0
6. Promote development of additional scheduled airlines and flights to/from Hot Springs	51.6
7. Require new developments to build sidewalks	49.3
8. Develop the Hot Springs Airport to a top notch general aviation airport	47.1
9. Widen Hwy. 70 through Hot Springs	45.6
10. Provide sidewalks along busy roadways	39.2
11. Promote public awareness of public bus system to increase use of public transit	28.9
12. Improve appearance of major roadways at entrance areas into the City (landscape, signage, fountains, lighting)	35.7
13. Expand existing public bus routes	17.6
14. Provide bike lanes along busy roadways	23.8

Within a short distance of downtown Hot Springs, Memorial Field Airport (KHOT) accommodates general aviation traffic and some airline service with two cross runways (Figure F-13). Mesa Airlines operates scheduled service with nineteen-passenger planes from Dallas-Fort Worth. The transit operator says the small flights do not create sufficient demand to serve the airport with regular transit schedules. Table F-2 shows that expanding activity at the airport has taken a place in public dialogue.



Figure F-13: Hot Springs Memorial Field Airport receives scheduled service from Dallas-Fort Worth.

F.3 The Trolley

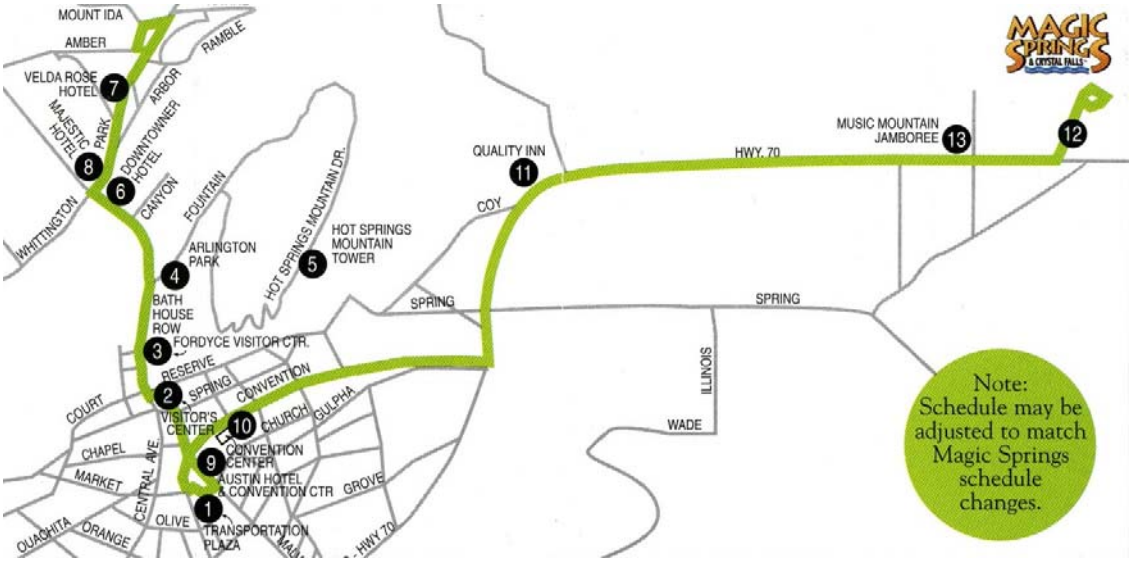
F.3.1 Current Conditions

Rubber-tire transit vehicles serving Hot Springs National Park resemble old-time trolleys (Figure F-14). They have seating for 21 passengers, and people may stand to increase capacity. The vehicles can also accommodate wheelchairs. Transit operations incorporated the full fleet of three trolleys in 2000 and 2001, but scheduling operations for two vehicles has sufficed in other years.

Trolley service serves stops in downtown Hot Springs and takes visitors to the national park up Hot Springs Mountain Drive to the Hot Springs Mountain Tower, which offers scenic views and a gift shop. The trolley route also takes people to Magic Springs Amusement Park and Magic Mountain Jamboree, which provide further recreational opportunities in the region (Figure F-15).



Figure F-14: The City of Hot Springs provides transit service to Hot Springs National Park on old-style trolleys (*181*).



1. Transportation Plaza
2. Visitors Center
3. Fordyce Bathhouse
4. Arlington Park
5. Mountain Tower
6. Downtowner
7. Velda Rose
8. Majestic
9. Austin
10. Civic Center
11. Quality Inn
12. Magic Springs
13. Music Mountain

Figure F-15: The trolley serves the city's downtown, Hot Springs Mountain Drive, and Magic Springs.[17]

Although many stops are fixed, trolley stops do not feature identifying infrastructure to provide amenity to passengers and to introduce the presence of trolley service. Passengers can also flag the trolley between stops. One primary piece of infrastructure does exist: the downtown transportation depot, a refurbished train station, harkens to the traditional style of the old-time trolleys (Figure F-16). The City intends for the depot to facilitate transfer between travel modes; to serve as headquarters for bus, taxi, limousine, and tourist vehicle operations; to provide parking for tourists and local employees; and, to alleviate some traffic congestion and parking problems downtown (*180*).

[17] This map appears in a brochure available at visitor centers and other locations. The brochure accidentally omits a green route line on Hot Springs Mountain Drive with stop five at Mountain Tower.



Figure F-16: The City of Hot Springs recently constructed a transportation depot.

Hot Springs has an unusual infrastructure characteristic: random benches (Figure F-17). Because local ordinances do not allow free-standing signs, a local entrepreneur started a business of installing benches around town and selling advertising space on them. These benches have no connection to public transportation, which deceives tourist expectation that a bench indicates a bus stop. For instance, a bench on the road at the airport receives no bus service and has no other apparent purpose to a traveler without any knowledge of local sign policies.



Figure F-17: Benches throughout the city offer advertising, not transit amenity.

For operations, trolleys run every thirty minutes on fare-free hour-long routes. The operating season starts on Memorial Day weekend and lasts through the Labor Day holiday. During the season, trolleys operate on 30-minute headways from 9:40 a.m. to 9:40 p.m. In the off-season, trolleys run on some weekends, for major public events, and to private events through rental arrangements.

In addition to the trolleys serving fixed stops at major recreation destinations, the City of Hot Springs operates scheduled bus service and paratransit across the city for local citizens and day-to-day needs (Figure F-18). Operators and citizens consider the trolley with its recreational orientation and the city bus service entirely different systems. Public perception leaves the city bus to lower-income residents, whereas people of a variety of socioeconomic backgrounds ride on the trolley. An intercity airport shuttle serves Little Rock National Airport (LIT) with five daily runs. This service, which requires 24-hour advance reservations, has the highest ridership numbers for the city's transit system.

Several stakeholders noted one area of transportation need that the trolley does not address: the recreational vehicle campground at Gulpha Gorge in the national park. The switchback turns on Hot Springs Mountain Drive make access to the mountain tower difficult for drivers of oversized recreational vehicles, such that people at the campground would benefit from having an opportunity to ride transit. Also, bus loads of campers often break out tents at the campground and need means for individual transportation. Trolley operations do not yet address the identified need for transit service at this location.

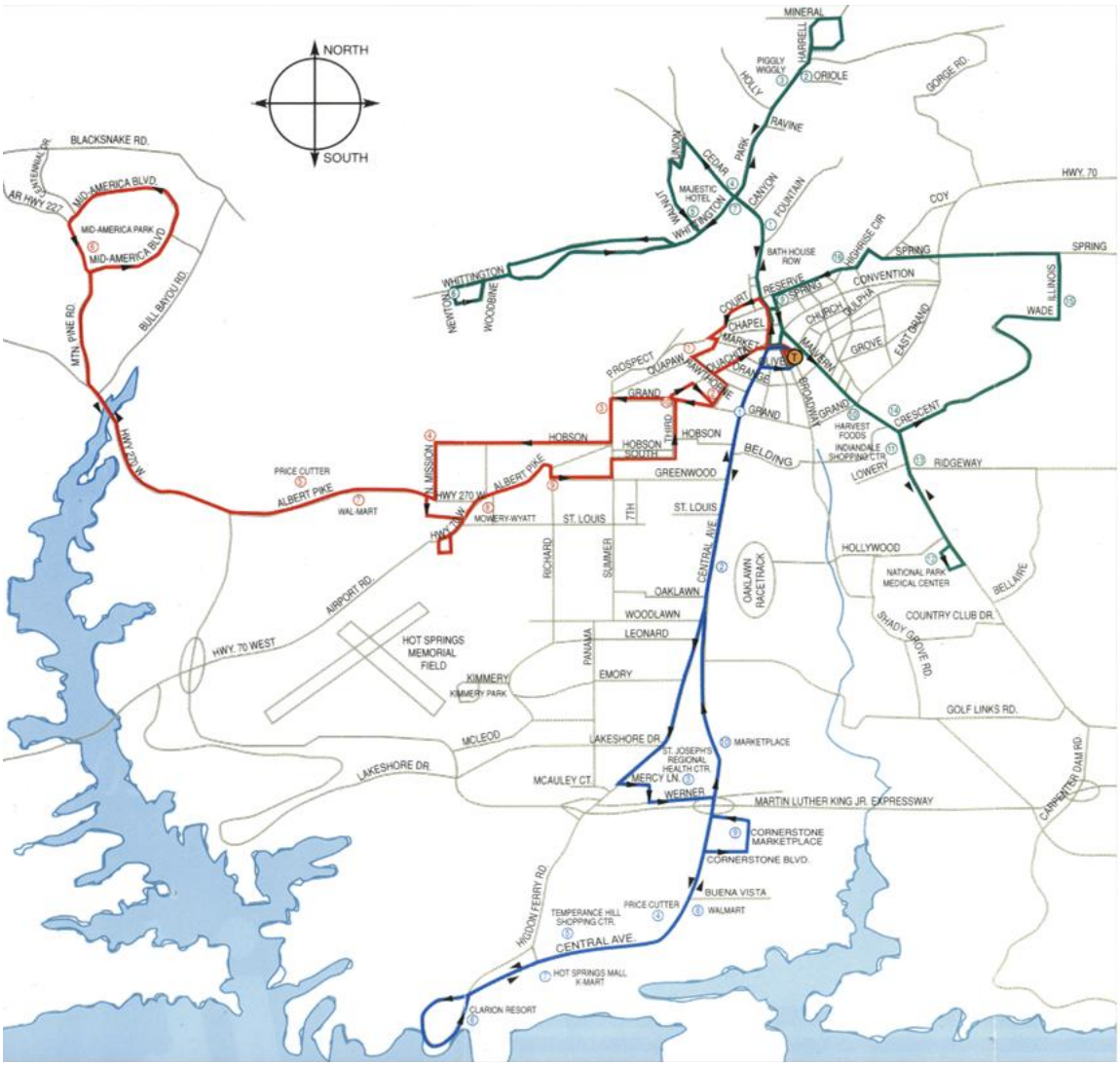


Figure F-18: City buses serve local residents with routes covering a larger part of the region. The trolley only serves the central part of this map.

F.3.2 History: Goals and Lessons

The City of Hot Springs funds the trolley system "to provide convenient, unique vehicles enhancing the mobility of shoppers and tourists within the Central Business Improvement District and offer visitors an opportunity to see the scenic gateway to Hot Springs as well as enjoy a visit to [the city's] major theme park, Magic Springs" (*182*).

Although not stated as a formal goal, the trolley can be and has been used as an economic development tool. When management for the forthcoming Magic Springs amusement park considered possible locations for a large recreational investment, the trolley at Hot Springs helped to sway them to locate in the region. Amusement park investors saw the trolley as a means of transporting both employees and customers to their site, so the agreement to locate in the region stipulated that the trolley would serve the amusement park. With the addition of the new stop when the amusement park opened in 2002, trolley ridership tripled.

In past years, the City of Hot Springs learned a lesson in the price sensitivity of the visiting public. The trolley operator formerly charged a one-dollar fare. Eliminating the fare increased ridership, so now the City offers trolley service fare-free. While the trolley fare existed, Hot Spring National Park viewed the trolley as equivalent to a for-profit tour bus, despite the need for public subsidy to cover the majority of costs for the service; therefore, the trolley operator had to pay an annual tour bus fee to gain access to park lands. When the trolley fare disappeared, Park administration reports it no longer considered the trolley a tour bus, so the trolley no longer incurred the tour bus fee for park access.

Trolleys have served Hot Springs for 25 years, but a major change in the service occurred in August of 2001 when operations shifted from contract service to management by the City of Hot Springs with a resident advisor. Further changes are occurring in local transportation since U.S. Census 2000 designated the region a metropolitan area. Based on this designation, Hot Springs now must establish a metropolitan planning organization (MPO) to conduct transportation planning and work within federal funding requirements

for the region. Increased regional transportation planning should result in greater integration of the various modes of transportation and a larger amount of attention to transportation and mobility issues.

F.4 Impacts

The integrated nature of Hot Springs National Park and the surrounding municipality make it difficult to isolate economic impacts of the park and specific functions associated with the park, such as transit.

F.4.1 External Influences

A variety of factors influence changes in the tourism industry. At a fundamental level, tourism communities must accept the significant effects of basic factors, such as weather and wildfires. Nearby tourism venues with big events might have minor or major impacts, and these impacts could compliment or compete with park attractions, depending on how tourists plan their time. As a weekend destination, Hot Springs National Park likely feels strong effects, either positive or negative, from special events in nearby cities.

Two important external factors affected the overall American tourism industry late in 2001: the economic recession and the terrorist attacks of September 11th. Industry experts cite increasing and decreasing influences on tourism since the attacks. People might be staying home for fear of terrorism or to save money. On the other hand, perhaps they spend less money on vacations by driving to parks than tourists would spend if they were to travel far from home. Although foreign visitation to national parks decreased, Americans are traveling domestically and identifying with national treasures.

F.4.2 Shuttle Impact

F.4.2.1 Employment

Because the City operates both the regular urban transit service and the recreational trolley, trolley drivers work on the same employment basis. Trolley drivers make the same wages as city bus drivers, so the only advantage or disadvantage to driving trolley routes comes in personal preference for routes and interaction with primarily local or tourist passengers. Drivers do not receive a designation specifically for the trolley route or for other city bus routes.

The trolley has brought an indirect employment benefit with the introduction of Magic Springs. Seasonal work in amusement parks might typically go to young people who might have neither private vehicles nor driver's licenses. This young population depends on other people for rides, or they can work within walking or bicycling distance of home. The trolley opens access to jobs for this disenfranchised population, and case study interviewees reported that passenger demand for the trolley rises particularly at shift-change time. Based on trolley service, Magic Springs has access to employees, and local residents have access to jobs at the amusement park.

6.1.1. Visitation Patterns

Hot Springs National Park counts its visitation with traffic counts, an electric eye count of pedestrians on the sidewalk outside the bathhouses on Central Avenue, and visitors to a medical center; 10,800 visits are added to each monthly count as a constant estimate of the number of people using thermal water jugs (*183*). With the open nature of the park and no fixed entrance stations, visitation estimations necessarily offer rough approximations of the number of people who use the park and park facilities, but the open

nature of access makes it difficult to isolate changes in visitation accurately to determine the impact of a new influence.

Based on the counting procedures in effect, visitation at Hot Springs National Park has lagged in recent years when compared with trends in the surrounding Midwest Region and the combined national total (Figure F-19). Hot Springs has had a reverse effect from national visitation: when national visitation rose, Hot Springs decreased and vice versa. The trolley changed to municipal operations in August of 2001, at which point the visitation downturn made an upswing; however, the striking revival of visitation between 2001 and 2003… an increase of 264,565 visitors… could not credibly be attributed entirely to a trolley system with 40,000 riders in 2003. More likely, another influence has attracted people to the park.

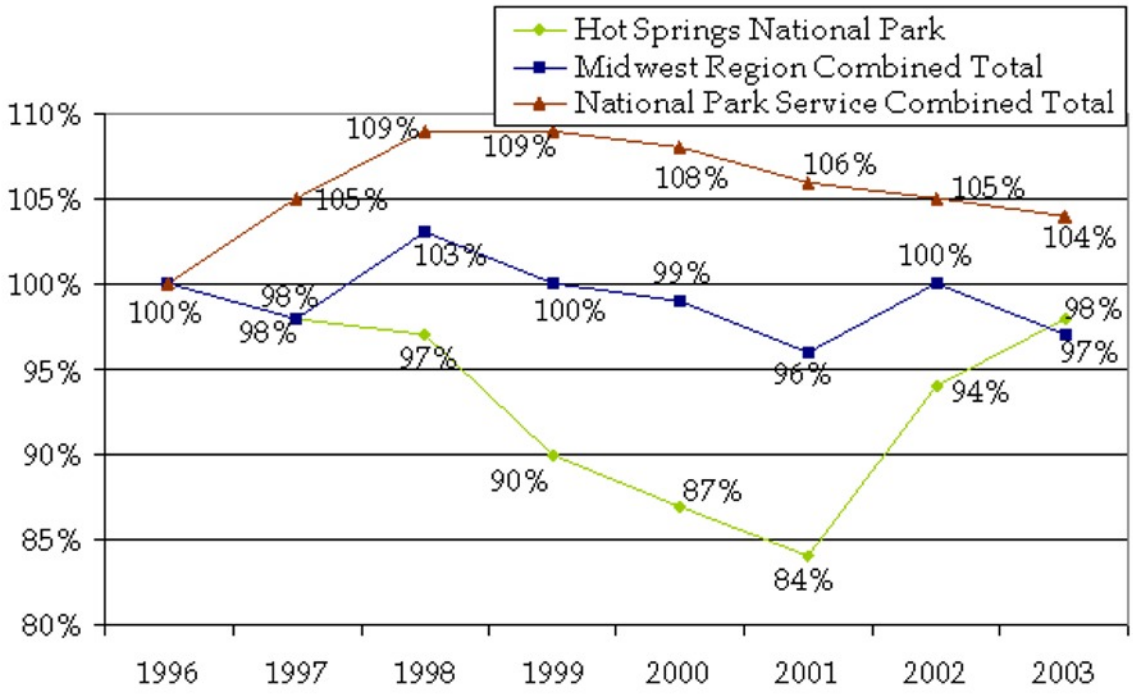


Figure F-19: Park and Regional Visitation Relative to 1996 Levels.

Stakeholders reported that visitors to Hot Springs come mostly from the local region as weekend visitors. Interviewees suspect that the fact that the national park attracts day visitors, rather than planned multi-day vacations, helped maintain visitation after the recession that started in 2001. Such a visitation pattern implies that people probably arrive in private vehicles from their homes in the region. Visiting the park will require them to find parking, and even if these visitors choose to ride the trolley, they will require a place to park and ride.

F.4.2.2 Ridership

The City of Hot Springs differentiates ridership for three distinct systems: the trolley serving tourist attractions, the fixed route city buses that largely serve the local population's day-to-day needs, and paratransit, which offers on-demand service without a fixed route or a fixed schedule (Figure F-20). Of these three systems, the fixed route system has the highest ridership, but it also has experienced some of the largest greatest fluctuations in ridership over the years. In 2001, the greatest jump in ridership on the fixed route system coincided with the greatest loss of ridership on the trolley route, which could have several implications. Perhaps some trolley riders had reason to use the fixed route system in that year instead of the trolley, or perhaps the data indicate an abnormality in ridership counting. In contrast, paratransit demand has demonstrated relatively steady growth from 1998 to 2003. As mentioned, the traveling public perceives each system to serve a different societal group. Public perception allocates city bus service to the low-income population, and people of all demographic groups ride the trolley. Some interviewees said that the Magic Springs route serves employees of the amusement park, but patrons use private vehicles.

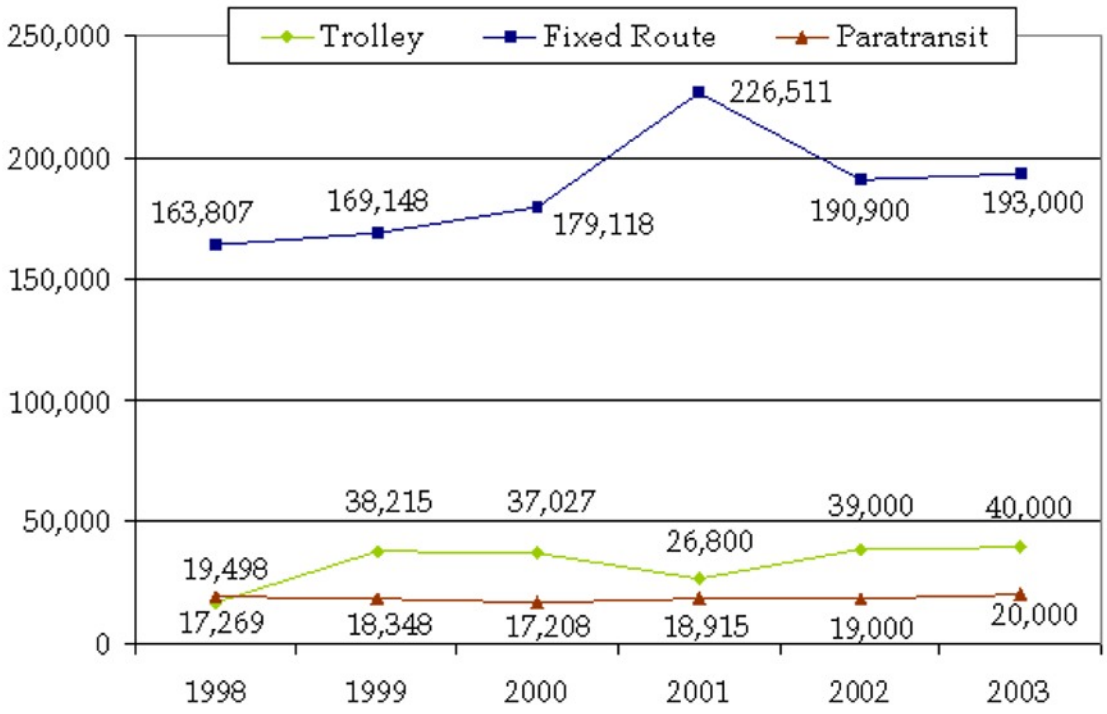


Figure F-20: Transit ridership for the City of Hot Springs.[18]

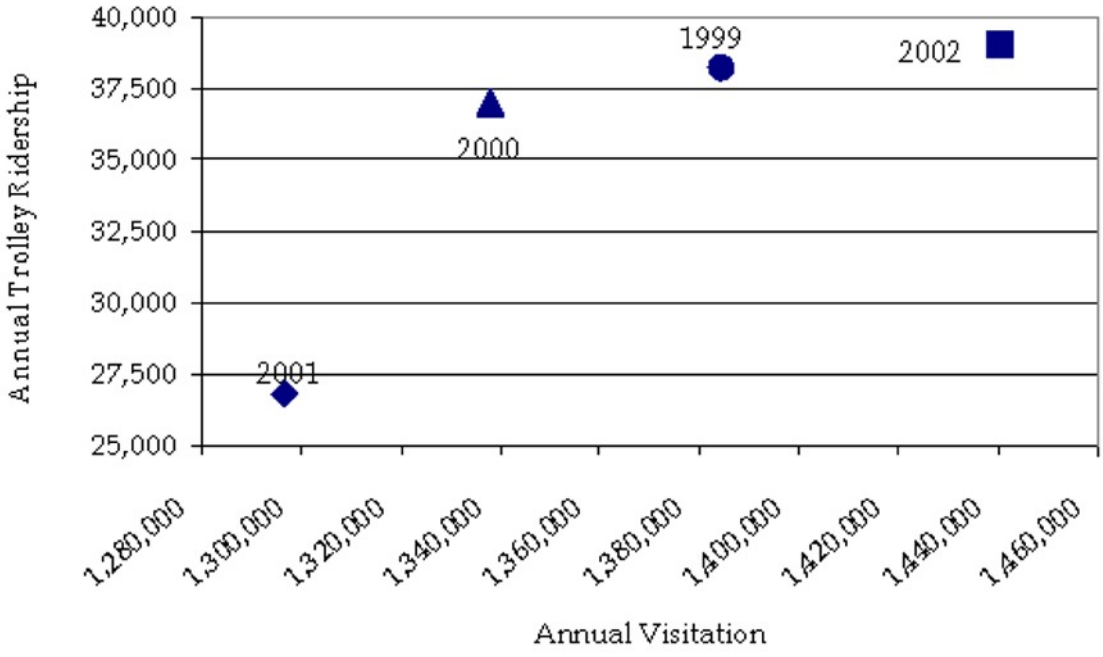


Figure F-21: Trends in the relationship between trolley ridership and visitation.

[18] This graph reflects estimated ridership for 2002 and anticipated ridership for 2003.

Comparing ridership to visitation does not indicate any clear trends in time in the four years between 1999 and 2002 (Figure F-21). The graph of the relationship does suggest a curvilinear relationship in which more people ride the trolley as visitation increases. The trolley appears to attract a disproportionately low number of riders as visitation falls down near 1.3 million, and ridership appears to level toward equilibrium near 40,000 as visitation increases. Verifying this relationship will require more data over time.

Seasonal ridership in 2002 reflected a typical recreational-area pattern of increasing numbers through the spring reaching a peak in July and dwindling into the autumn (Figure F-22). This pattern typically makes transit service difficult to operate because skilled drivers and mechanics typically require work through the full year; however, Hot Springs has a unique advantage. Because the trolley shares staff with the fixed route system for the city, peak summer season requires only an expansion of year-round staffing, rather than a purely seasonal staff.

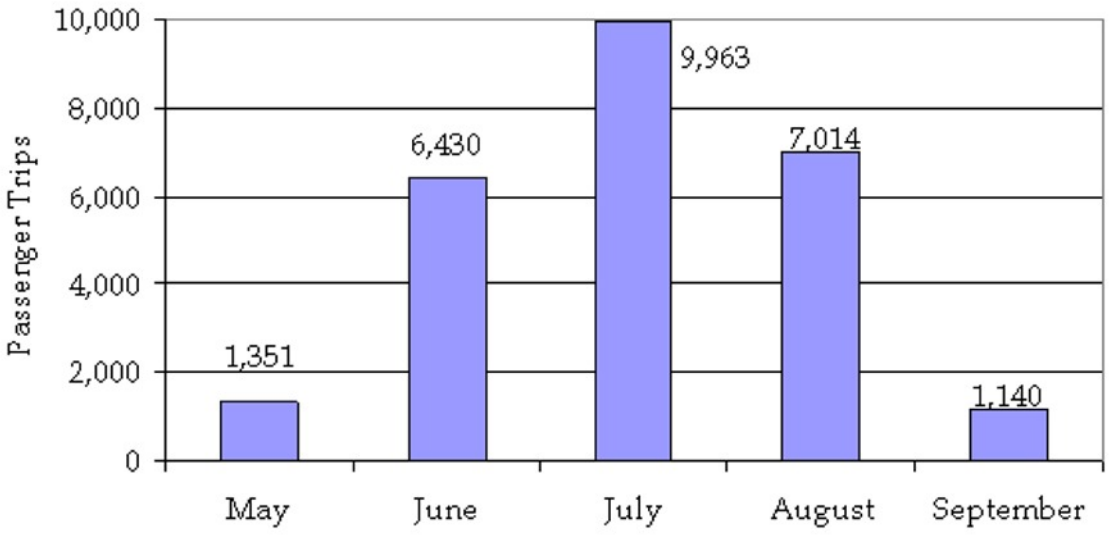


Figure F-22: Seasonal ridership on the trolley route in 2002.

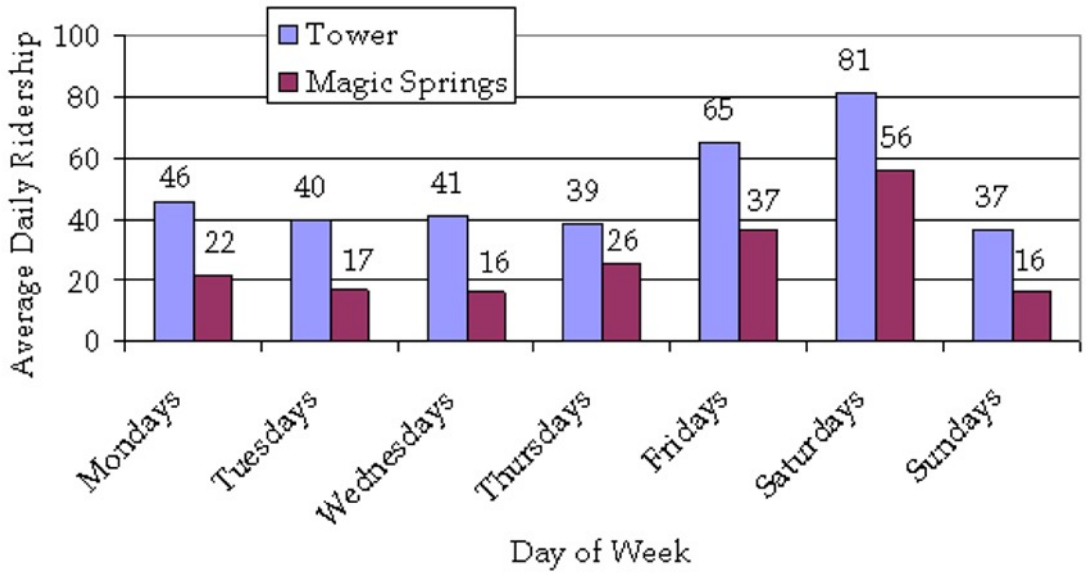


Figure F-23: Average daily ridership on the trolley in 2002.

A 2003 proposal suggested eliminating Sunday service to save money on a day with low ridership (*182*); however, average daily ridership figures do not support the proposal (Figure F-23). On Sundays in 2002, trolley service demand of 37 passengers for the mountain tower fell only slightly shy of demand on Tuesdays (40), Wednesdays (41), and Thursdays (39), and the numbers reflected roughly equivalent average daily demand for transportation to Magic Springs on Sundays (16), Tuesdays (17), and Wednesdays (16). With 81 passengers going to the mountain tower and 56 going to Magic Springs on Saturdays, the early part of the weekend has proven itself the highest demand time of the week, which supports interviewees' assertion that Hot Springs National Park largely attracts weekend visitors from the immediate region.

F.4.2.3 Parking

Park lands and city streets have an insidious parking problem. The magnitude of the problem hides itself in flowing movement of Main Street and the difficulty assigning responsibility for providing parking. When asked about parking problems for the national park, officials declared that Hot Springs National Park has no parking problem by the bathhouses and visitor center because the National Park has no parking there. Conversely, the National Park Service has also suggested that the bathhouses remain closed in part because visitors have no access to parking. To accommodate parking needs for park operations, Park Service vehicles frequently appear on the sidewalks outside the bath houses (Figure F-24). The more rural park areas have pullouts and delineated parking areas that appear to accommodate parking demand.



Figure F-24: For lack of available spaces, National Park Service vehicles regularly park on the sidewalk in front of the bathhouses. The picture on the left came from a Federal Transit Administration study in 2001 (*181*), and the picture on the right came from the site visit for this case study.

In contrast to the Park Service interpretation of the parking environment, the City of Hot Springs has undertaken constructing a 325-space multi-level parking garage directly

across the street from the bathhouses and promenade at a cost of $5 million dollars (*181*). The parking garage design includes fountains and other aesthetic landscape architecture to fit the local character of the national park (Figure F-25). This parking garage will serve both patrons of downtown businesses and visitors to the national park; many times, these two groups overlap each other. Ten-hour parking meters have also appeared on nearby streets to manage parking.



Figure F-25: The City of Hot Springs has built a large parking structure across from Bathhouse Row and the promenade to accommodate tourist parking needs.

The dichotomy of opinions on parking needs and the extremes of investment in solutions suggests a lack of willingness to work together to address mutual issues that move between the borders of municipal and federal lands. Given that visitors to the park patronize local businesses and that local businesses provide food, lodging, services, and retail support to promote the national park, a collaborative approach to the parking problems of the area seems sorely lacking. Even the major investment into constructing the downtown parking garage could fall short of meeting demand. A study of central business district redevelopment conducted by the University of Arkansas Community

Design Center showed that the downtown area required a 528-space facility, and researchers on that study concluded that if Hot Springs National Park redevelops its bathhouses, accommodating increased visitation will require 400 spaces in the immediate downtown area (*181*). Such an increase in demand would require a coordinated approach to addressing parking needs.

F.4.2.4 Industry Sectors

Given the relatively low ridership of the shuttle system, few businesses reported significant impact from the trolley generating more business. The retail concessioner at the tower did report that roughly 25 percent of its patrons arrive on the trolley when it operates. Tourism services also benefit in terms of job access for Magic Springs Amusement Park. Smaller business owners speculate on the impact of the shuttle. It might take people past their businesses rather than into them; it might help create a recreational atmosphere that benefits businesses. When the City of Hot Springs has raised the question of terminating shuttle service to cut costs, the business community has arisen to express that the old-style trolley contributes to the character of the tourism community.

F.4.2.5 Long Term Costs

Hot Springs has an advantage over many gateway communities for rural parks: this city has enough population base to merit federal transit funding under the current system that allocates funds according to residential population. Consequently, federal grants provide the largest share of funding to cover the expenses of transit. The City also represents a substantial enough population to collect revenue and provide a local match for those federal funds (Figure F-26). Although passengers ride the trolley without

paying fares, fare revenue from the City's other transit services contribute revenue to fund transit. This revenue covered 40 percent of transit expenses in the 2003 budget. In that budget, the trolley required $158,301 for capital, administration, and operating expenses; the full intracity transit system required a total of $1,498,000 (*182*).

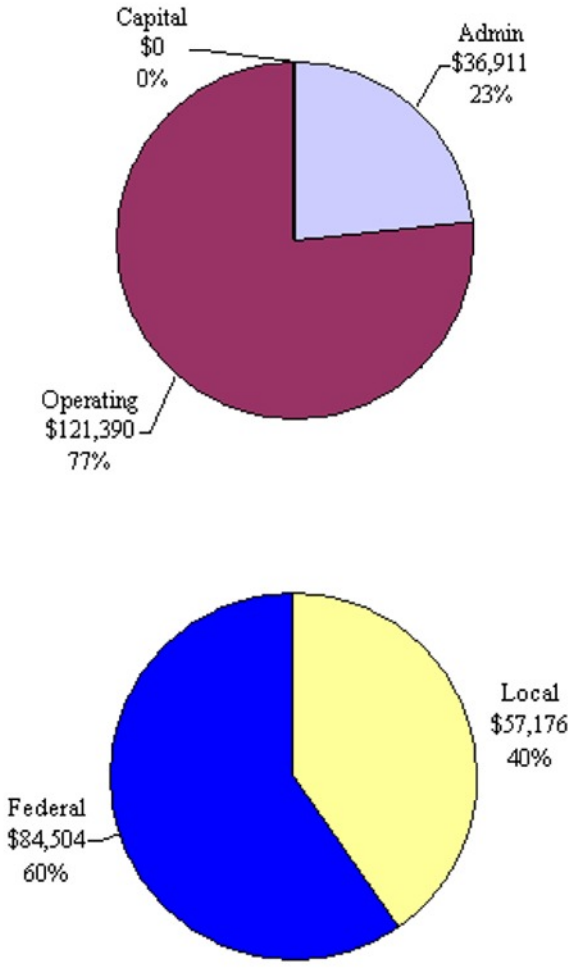


Figure F-26: Hot Springs 2003 trolley budget expenses (top) and funding (bottom).

F.5 Recommendations for Hot Springs and Hot Springs National Park

Establish clear communication and true partnering practices that acknowledge stakeholder interests and abilities to contribute to planning and solutions. Hot Springs lacks clear communication and information. Interviewees described a local culture where any meeting will have a greater number of opinions than participants attending. More so than in the other case studies for this research, case study participants for Hot Springs had different perceptions of basic facts, such as whether or not Hot Springs National Park continues to charge a tour bus fee for the trolley to access park lands. Discussions, meetings, e-mail, web sites, and all the other modern forms of communication available can help the stakeholders of Hot Springs to do more efficient transportation planning to offer high quality visitor experience to satisfy visitors, patrons, businesses and local leaders. Agencies need to come together to discuss transportation needs. The new regional approach to transportation panning that will come from the installation of a metropolitan planning organization should help facilitate communication and coordination.

Collaborate on parking. The parking issues of Central Avenue originate from both sides of the street, and parking problems affect both the municipality and Hot Springs National Park. The solutions to shared problems come through collaborative efforts. Park and city leaders should collaborate and strategize economic development and circulation among the park attractions, the visitor center, tourism-oriented businesses downtown. When considering transportation as a system of public mobility, parking and transit enter into the same discussion. For people to use the trolley to access the mountain, they will need to leave their private vehicles somewhere. Preferably, they will

explore the mountain, the bathhouses, and the city from the trolley and the sidewalk, thus collaborative provision for parking and trolley access will benefit both the park and city.

Survey the local businesses. Transit system organizers should take a survey of local businesses to find out their perceptions and ideas on local transportation. Given that the business owners have a diverse range of opinions on the trolley, documenting these opinions and understanding how widely each opinion is shared will help move transit planning away from a system of reacting to the loudest voices to a methodical proactive approach to working with the needs and resources of the business community. If Hot Springs National Park serves as the largest economic generator for tourism in the state, it makes sense to consider the local economy in park planning. Hot Springs, in turn, relies on the state for things like highway maintenance to deliver visitors to the park.

Conduct a visitor survey. The case study interviews showed that people have differing opinions on the transportation situation in Hot Springs and differing ideas on how to handle transportation. For all of the stakeholders with a voice in the area, visitors probably have the most difficult time representing their wants and needs. Specific to the trolley, this visitor survey should discern stated preferences and revealed behavior:

- Do they depend on the trolley to get past the switchbacks up the mountain, because they feel they can watch the scenery without concentrating on driving, or so they can experience the local character of the trolley?
- Would people visit the tower if the trolley did not exist?
- Where do people park? Will parking congestion deter them from returning to Hot Springs in the future?

Without a survey, transit system organizers can only speculate and debate on how visitors to transportation policy changes. A visitor survey will form the basis for sound transportation decisions affecting visitors to the area.

Serve Gulpha Gorge. Recreational vehicle drivers have demonstrated in other parks that they will readily leave their oversized vehicles parked and take transit. In doing so, transit removes from the road vehicles that create greater than average emissions, block site distances (which reduces visitor experience for others), and exacerbate traffic congestion more than lighter vehicles by nature of their size and speed.

Engage volunteers. Volunteers have substantially improved the park environment at Hot Springs through their successful efforts to restore the Grand Promenade (Figure F-7). Could they work to create a consensus opinion on the trolley? Could they coordinate needs and resources to develop a solution to parking problems that cross jurisdictional borders? Educating and engaging the volunteers who have contributed to the Promenade could yield creative solutions to transportation problems in both the park and the town.

F.6 Possible Implications for All Parks

The tripling of ridership with the addition of one stop shows that **small changes to transit service can lead to substantial changes in ridership**. Anywhere that transit exists, operators and stakeholders in that system should analyze the local situation and ridership data to determine if the system design meets local needs and goals. Ridership often correlates with the ability for transit to achieve its goals: as transit attracts more riders, this mode of transportation makes a greater impact on overall transportation in a region. Often, a careful analysis of route structures, stops, and schedules can create impacts on ridership at relatively low cost to transit operations.

With city transit service and the tourist trolley under the same management, Hot Springs offers an interesting example of **complementary systems**. The complementary systems benefit from sharing staff, and potential exists to share route coverage, such that a small number of specially designed tourist vehicles can serve primary destinations, but regular public transit vehicles can ensure that people can connect to that service from a wide area.

Image matters. In Hot Springs, the trolley serves tourists; the bus serves the poor and mentally ill. The image people have of transit system will affect who rides it. Care must go to defining and maintaining the image of transit service in parks and gateway communities.

Transit can be used as an **economic development tool**, as evidenced by Magic Springs stipulating service to locate in the Hot Springs recreational region. Local businesses have repeatedly fought proposals to terminate the trolley service because business owners have felt the trolley contributes to the historic character of the area. Economic developers and chambers of commerce can learn from these examples to market recreational transit service as an asset of recreational communities.

Despite efforts at the federal level of the National Park Service to emphasize **partnering** with gateway communities, the situation at Hot Springs stands out as an example of outdated institutional attitudes on communication. Consistently, interviewees indicated that they did not consider partnering efforts important. One interviewee indicated, “Cooperation among leadership of the City is as good as it can be.” In fact, partnering can have no relevance where it does not exist, but when it does exist, the

partners can often achieve far more with consolidated resources than the individual interests can achieve on their own.

- The National Park charging the City tour bus fees for the trolleys to enter the park illustrates a lack of partnering. In fact, if a locality is offering public transit at typical transit fares, it is not making a profit. Transit requires subsidy. Tours costing tens of dollars per passenger constitute for-profit transportation service, and parks can legitimately charge these operators tour bus fees. At a one-dollar fare, the City was only recouping a fraction of the money it was spending to provide visitors access to the national park. In other words, the City was performing a service for the visitors and the National Park Service, and in turn, the National Park Service charged a fee for the City to do that favor.
- The City of Hot Springs has likewise demonstrated its closed-door planning. The change of route to go to Magic Springs went through the Transportation Advisory Board and the Council in the City, but the National Park Service received no invitation to participate in talks about a significant change to transportation service accessing the park.

Transit system organizers need to realize that where parks and gateway communities have integrated lands, the parks and gateway communities have **shared parking problems**. Hot Springs has shown that the actions of one political entity can benefit another, as in the case of the City of Hot Springs providing transit service and building a new parking garage. Again, having all entities acting as true partners can help provide more comprehensive solutions that address needs of all stakeholders.

Perhaps as one of the biggest lessons in partnerships, the Hot Springs case shows that **transportation partnerships can emerge from different stakeholders**. In many parks, the National Park Service designs a transit system and looks for support from gateway community stakeholders, but in Hot Springs, the City originated the idea and started the service. That service has now grown into a signature piece of visitor experience and means of accessing the park. Great Smoky Mountains National Park has a similar situation where the City of Gatlinburg, Tennessee provides a small trolley service into the park while the National Park Service continues to work through internal systems to create a full-scale public transit system. Importantly, administrators in the National Park Service need to realize that innovation does not have to originate internally. If park administrators give other stakeholders the leeway to take initiative, new partnerships might fill some transportation gaps that the National Park Service has difficulty filling.

F.7 Summary

The City of Hot Springs, Arkansas operates a fare-free trolley to offer public access to Hot Springs National Park. The system changed from contracted operations to in-house management in 2001, and this change resulted in a change in routing to include another recreational destination, the amusement park Magic Springs. Ridership has increased since these changes. For visitors to the national park, the trolley offers an alternative to downtown traffic congestion and a means of accessing a mountain tower at the end of a mountain road with switchbacks unnavigable for oversize recreational vehicles. With bathhouses, the major attraction of the national park, on the opposite side of Central Avenue from downtown shopping, leaders of the city and the national park share parking problems in the same congested area. Despite the opportunities for

partnering on transportation and parking issues, park administration, city government, and representatives of other stakeholder groups do not report collaborative relationships. They report their activities to one another, but the various entities do not invite contribution to their planning processes and do not participate in each other's planning for transportation issues. The city of Hot Springs is emerging from a substantial economic downturn that peaked in the 1980s, and downtown development of the region's largest convention center shows that local leaders are conscientiously addressing development of tourism in the area. If local leaders realize their vision, visitation to the national park will increase with the city's increased prominence as a visitor destination. Local communication and collaboration on transportation issues will grow into an important public issue.

(*178*) Galiano, Amanda. "The Magic Comes Back," *Your Guide to Little Rock, Arkansas*, October 27, 1999. http://littlerock.about.com/library/weekly/aa102799.htm

(*179*) Arkansas Department of Economic Development Research, "2003 Arkansas Economic Report," December 2003. http://www.1-800-arkansas.com/data_demographics/files/2003%20Economic%20Report.pdf

(*180*) B&F Engineering, Inc. and Carter and Burgess, Inc. *Comprehensive Plan: City of Hot Springs, Arkansas,* September 1997.

(*181*) Cambridge Systematics, Inc. and BRW Group. *Federal Lands Alternative Transportation Systems Study* prepared for the U.S. Department of Transportation Federal Highway Administration and Federal Transit Administration, August 2001. http://www.fta.dot.gov/library/policy/fedland/

(*182*) "Hot Springs Intracity Transit (IT) 2003 Grant Application (49 USC § 5311) Summary," prepared for a public hearing on October 30, 2002.

(*183*) Hot Springs National Park Public Use Counting and Reporting Instructions, December 10, 1991, http://www2.nature.nps.gov/stats/pdf/hospci92.pdf.

APPENDIX G: CASE STUDY OF YOSEMITE NATIONAL PARK AND MADERA, MARIPOSA, MERCED, MONO, AND TUOLUMNE COUNTIES, CALIFORNIA



Figure G-1: Shuttles at Yosemite National Park.

G.1 Introduction

As the National Park Service advances in its mission to address surface transportation problems in the park system, local communities around parks wonder how changing patterns of visitation will affect them. Examining the effects of transit in parks that recently have introduced transit or have made major changes to existing transit service can offer potential insights on what gateway communities can expect to result from alternative transportation systems.

Yosemite National Park has recognized the problems of its popularity for decades, and a 1980 *General Management Plan* indicated an intention to remove private vehicles from Yosemite Valley. Toward this end, contracted transit service in Yosemite Valley

has operated for many years. In a more recent initiative, surrounding counties have collaborated to create transit service taking people from gateway communities into the park. Although many people see the need for such service, collaborative efforts failed to the point that two counties dropped out of the five-county process, and ridership on the new system has not made a substantial change in private vehicle demand for entrance to the park. This Yosemite case study offers insight into the challenges of pulling together multiple stakeholders with competing interests. Data collection for this report took place during a site visit to Yosemite from May 11th through 17th, 2003.

This report comes as part of a larger research project examining the impact of transit at a number of national parks and gateway communities. Field data collection here has contributed to a multiple-case study analysis, in which local stakeholders of various interests (representatives from the towns, parks, and transit operators) were interviewed to determine the overall impact of transit on segments of local communities and on local regions for each of several parks. Information for the case studies comes from a combination of interview results, public documents, direct observation of how the transit system serves the local environment, and archival data on visitation and travel patterns.

This site report does not consider this location's experience with transit in comparison with other similar locations. These analyses appear in the full report. The results of this site report will interest the park and community studied, other parks and communities entertaining or implementing transit, and the National Park Service, as it continues to develop transit strategies at the national level. This research was made possible in part by a grant from the National Park Foundation through the support of the Ford Motor

Company, a Proud Partner of America's National Parks. The National Park Service provided additional funding.

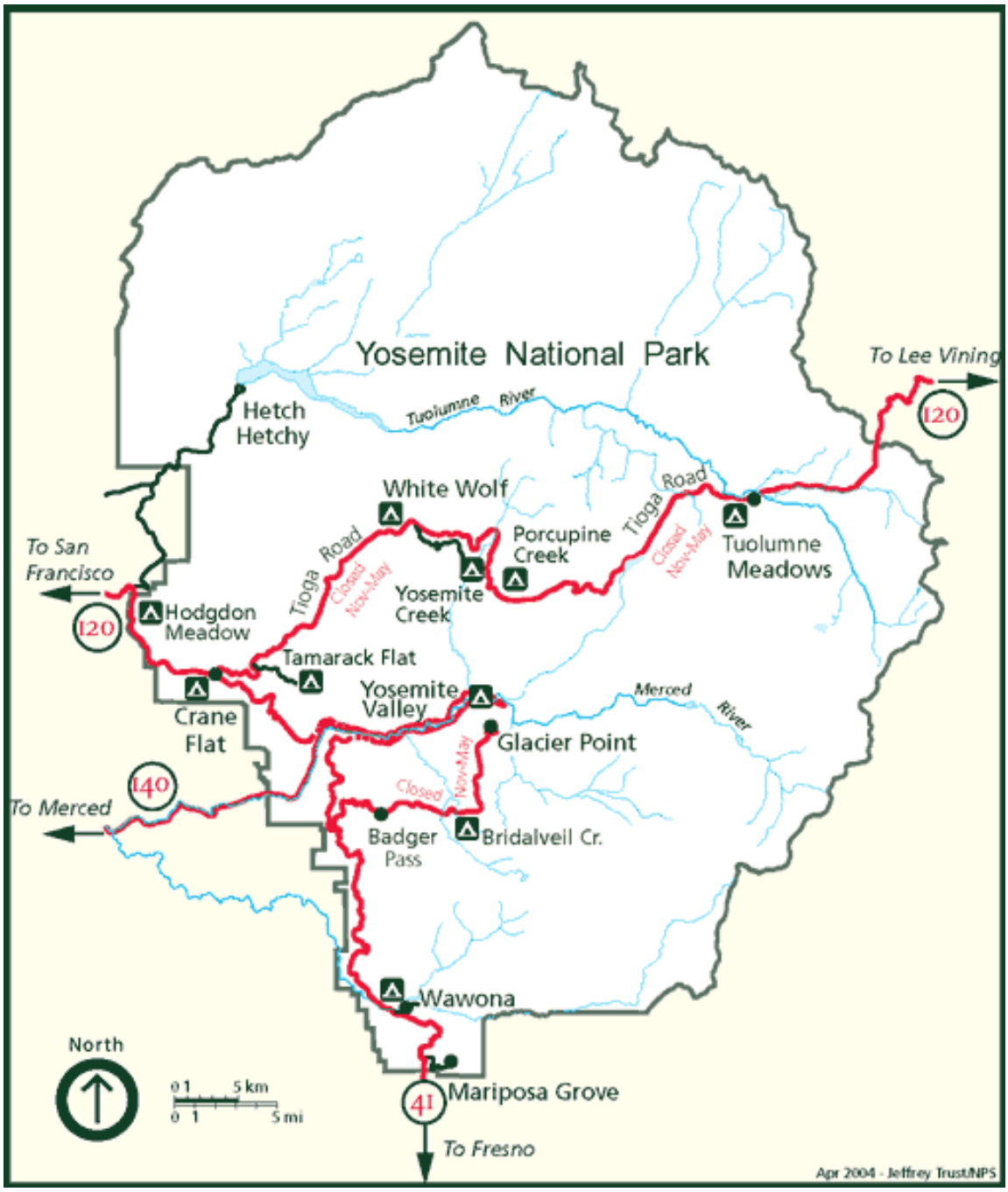


Figure G-2: Yosemite National Park map.

G.2 Background

6.2. Yosemite National Park

Yosemite National Park spreads across 761,266 California acres (3.1 square kilometers) in the Sierra Nevada Mountains with cliffs, waterfalls, meadows, and forests. The park has five entrance roads (Figure G-2), such that people can access the park from several directions. From the High Sierras in the eastern part of the park, Tioga Road traverses mountains at high altitudes; safety dictates that this road closes in the winter (Figure G-3). All highways entering the park wind through mountains down to the floor of the Yosemite Valley in the west central part of the park.

Roughly 3.4 million visitors from the surrounding region, the nation, and the world make a pilgrimage to Yosemite annually. About 70 percent of all visitors go to the Yosemite Valley (Figure G-4). This narrow space follows the Merced River for 7.5 miles (12.1 kilometers) with flat land one mile (1.6 kilometers) wide surrounded by 3,000-foot (914-meter) granite cliffs (*184*). The Yosemite Valley has a large concentration of attractions and amenities.



Figure G-3: Yosemite closes the North Tioga Road in winter due to mountain snow.

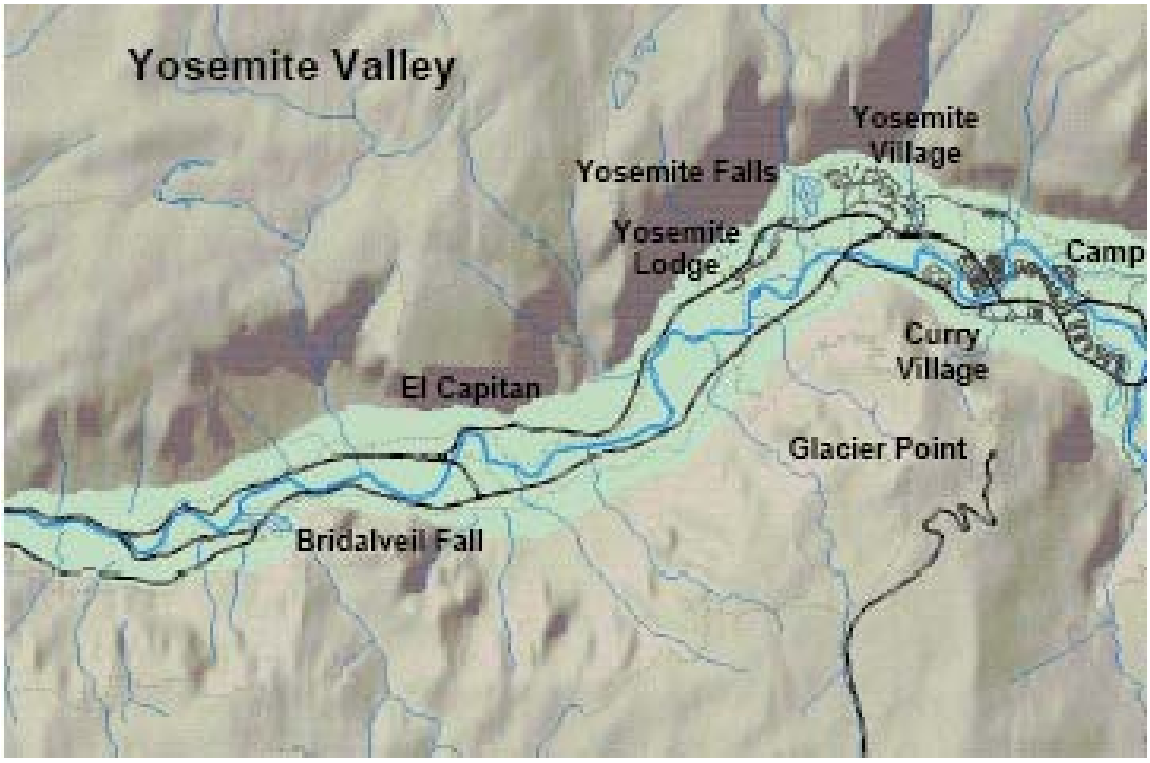


Figure G-4: The Yosemite Valley attracts 70 percent of visitors to Yosemite National Park (184).

A typical visitor to Yosemite lives in California and travels to the park with a group of mature adults. A 1999 Visitor Use Study (*185*) showed that about half (51 percent) of visitors ranged in age from 30 to 60 years, and 42 percent of the people traveled in parties of mature adults. Another 33 percent traveled in families. More than half (53 percent) of the total visitor base lived in California, and 84 percent of these Californians reported they had visited Yosemite previously. With a median number of previous visits at 9.4 for repeat visitors from California, Yosemite has a loyal base of devotees in the surrounding region. In 1999, United States residents made up 76 percent of all visitors, compared with 97.5 percent domestic visitation in 1975. Foreign visitors primarily lived in Europe in 1999 (90 percent).

Visitors can access Yosemite by a number of modes of transportation (Table G-1). The National Park Service offers seven-day passes for access to the park; these entrance fees cost $20 per car or $10 per individual arriving on bus, motorcycle, bicycle, or foot. The largest proportion of visitors arrives by private vehicle, but regional providers are working to create more options for access. Via Adventures operates the Amtrak, Via, and Yosemite Area Regional Transportation System (YARTS) bus links into the park.

Table G-1: Public Modes of Access to Yosemite

Mode	Facility	Location Relative to Yosemite	Drive Time to Yosemite
Air	Fresno-Yosemite International	South	2.5 hours
	Merced Airport	West	2 hours
	Modesto City-County Airport	West	2 hours
	Mammoth Lakes Airport	East	2.5 hours
	San Francisco International	West	5 hours
	Oakland International	West	4 hours
	Sacramento International	Northwest	4 hours
	Reno-Tahoe International	Northwest	4 hours
Train	Amtrak	Bus connection to park	None
Bus	Via	In park	None
	Yosemite Area Regional Transportation System (YARTS)	In park	None

Source: Yosemite National Park web site http://www.nps.gov/yose

By the 1970s, administrators at Yosemite National Park fully recognized that the popularity of Yosemite was creating substantial difficulties in terms of traffic congestion and vehicle emissions in the vulnerable California airshed. Shuttle service started on the

Yosemite Valley floor in the 1970s. The 1980 *General Management Plan* for Yosemite established a strong policy statement on the future of private vehicles in the park (*186*):

> The National Park Service is committed to reduce the effects of private vehicles on the park experience and resources. Private vehicles will ultimately be excluded from Yosemite Valley. The immediate steps to be taken include the removal of more than 1,000 parking spaces from the Valley and enforcement of an automobile carrying capacity. This will be accomplished through an information system at park entrance stations, with traffic controls at the Pohono and El Capitan crossovers to restrict access to the east end of the Valley when daily capacities are reached. The shuttle bus system will be improved to provide optimum service, including service to the Valley from parking areas at El Portal, Crane Flat, and Wawona. Traffic within Mariposa Grove will be restricted, and the shuttle will be extended.
>
> A study will be undertaken to find a method to totally eliminate cars and other obtrusive vehicles from Yosemite Valley. As additional bus service from outlying areas on the periphery of the park and in gateway communities becomes feasible, all day visitors and ultimately all overnight visitors will be able to enjoy the Valley without their cars. Each phase of the transportation system will be adequately planned to minimize environmental impact, solve operational problems, and promote public acceptance.
>
> *Yosemite National Park General Management Plan,* 1980

Park administration felt that voluntary shuttle service alone would not suffice. Even with shuttle buses in Yosemite Valley and greater management of campsites, the *General Management Plan* from 1980 called for "even more dramatic changes to protect what is spectacular about Yosemite and to meet the various expectations of this generation of visitors." This document established visitor use levels according to proposed capacities of development, such as reduction in overnight accommodations, particularly in Yosemite Valley (Table G-2).[19] If visitation levels continue to rise while overnight

[19] These capacities get quoted at different levels of rounding in different sources. The original numbers are available in the *General Management Plan* at <http://www.nps.gov/yose/planning/gmp/intro97.html>.

accommodations decrease, visitors must all channel daily onto the roads leading into the park, rather than walk out of their hotel rooms.

Table G-2: Overnight Capacity Standards in the *General Management Plan* (*186*)

Facility	Yosemite Valley		
	Existing	Change	Proposed
Accommodation units	1,528	-268	1,260
Camping sites	872	-116	756
Total Overnight Units	2400	-394	2006

In addition to these changes for visitors, the *General Management Plan* established goals of reducing the number of seasonal employees housed on national park lands. In the Yosemite Valley, park administration resolved to decrease the number of employee housing units from 1,510 to 480, a reduction of more than two-thirds (*186*). Moving employees out of the park or to more remote areas of the park will decrease human activity in Yosemite Valley, but it will increase vehicular activity because employees who previously walked to work will need to use motorized vehicles.

Yosemite National Park has not produced a new general management plan since 1980, but park administration tried in 2000 to amend the 1980 plan with the *Yosemite Valley Plan* and the *Merced River Plan*.

Of the five alternatives presented in the environmental impact statement of the Yosemite Valley Plan, the preferred alternative calls for the reduction of Valley day-use parking spaces to 550 from the existing 1,662 spaces, which are typically fully occupied on a busy day. A new lot at Camp 6 will provide all of these parking spaces in proximity

to a proposed transit hub requiring up to 22 bus bays with expected activity of bus departures every 2.2 minutes. When the Camp 6 lot fills, rangers at entrance gates will direct visitors to park-and-ride lots outside Yosemite Valley. Overnight visitors will have permits to park only where they are staying, losing privileges to park at other destinations and roadsides. Employees living in Yosemite Valley will park near their residences; all other employees will use employee transportation provided (*187*).

The *Yosemite Valley Plan* moves toward the goal of eliminating private vehicles in the Yosemite Valley by reducing day parking spaces. If fewer visitors stay and fewer employees live in Yosemite Valley, then more people will become day visitors, but if day parking spaces simultaneously decrease and the general population cannot reasonably cover distances and terrain by non-motorized means, people must choose to take transit or avoid the park. Vocal local activists disfavor eliminating private vehicle access.

Two nonprofit groups, the Friends of Yosemite Valley and Mariposans for Environmentally Responsible Growth, sued the National Park Service in 2001 over the *Merced River Plan* (*188*). The *Merced River Plan* was intended to work in conjunction with the *General Management Plan* and the *Yosemite Valley Plan* "to provide direction and guidance on how best to manage visitor use, development of lands and facilities, and resource protection within the river corridor" (189). Opponents felt that the *Merced River Plan* allowed too much development. In the lawsuit, the plaintiffs alleged that the *Merced River Plan* would not adequately protect the Merced River's ecology and the special values of the river that earned it official designation under the Wild and Scenic Rivers Act of 1968. Federal District Court Judge Anthony Ishii ruled against the plaintiffs on most counts in 2002, but appeals led to the invalidation of the *Merced River*

Plan in 2003 and an injunction in 2004 on five Yosemite Park projects in dispute, including a project for the Camp 6 Parking Lot and Yosemite Village Transit Center. In the original lawsuit, the plaintiffs had alleged that the transit center at Camp 6 near the river would create a "destination hub" and "the start of the regional transportation system" until the elimination of private vehicles in the valley would allow the transit center to "revert back to background zone." The District Court has ordered the National Park Service to issue a new or revised *Comprehensive Management Plan/Supplemental Environmental Impact Statement for the Merced River* (*190*).

In addition to the policies that have generated discussion among stakeholders, two major events in the mid-1990s significantly affected visitation and transportation in and around Yosemite National Park today: the activation of the Restricted Access Plan in 1995 and the flood of the Merced River in 1997. The first event came in the form of policy action, and the natural environment spawned the second event.

Activation of the Restricted Access Plan: Park officials had created a Restricted Access Plan for closing entrance gates when the number of vehicles entering Yosemite Valley exceeded the available supply of roughly 1,200 parking spaces. In the 1995, peak summer visitation exceeded the trigger point, and the park administration closed the entrance gates to additional vehicles. With travelers waiting for hours to enter the park and press coverage saying the park had closed, people stopped going to the park. Visitation declined, and local businesses dependent on the crowds of the summer tourist season suffered (*191*).

A *Transportation Alternatives Study* submitted for the National Park Service in 2000 listed several problems encountered with the implementation of restricted access (*192*):

- "Park visitors were not informed in advance when access was restricted.
- "Some visitors who had traveled long distances did not get to see the Valley scenery, especially if they had limited time to visit the park.
- "It was difficult or impossible to sort visitors who had reservations for campgrounds or lodging in the Valley from day visitors at the traffic control point.
- "The plan could have increased traffic, congestion, and crowding in areas in the western part of Yosemite Valley as vehicles circulated to and from the control point at El Capitan crossover.
- "Traffic congestion reached unacceptable levels well before the restrictions could be implemented.
- "Parking areas were usually full before roadways became highly congested. Visitor vehicles circulating in search of parking then contributed to worsening congestions.
- "The Restricted Access Plan is labor intensive. It diverts limited numbers of park staff from important safety and educational activities.
- "News of restricted access may have caused some visitors to avoid the park, resulting in impacts to the local economy."

Effects from the 1995 activation of the Restricted Access Plan still linger. Nearly a decade later, visitors still call local businesses to ask if they will have access to the park, even though visitation has never reached the same peak levels in subsequent years. Yosemite is looking for alternatives to closing its entrance gates because the park cannot accommodate the demand for private vehicle parking spaces.

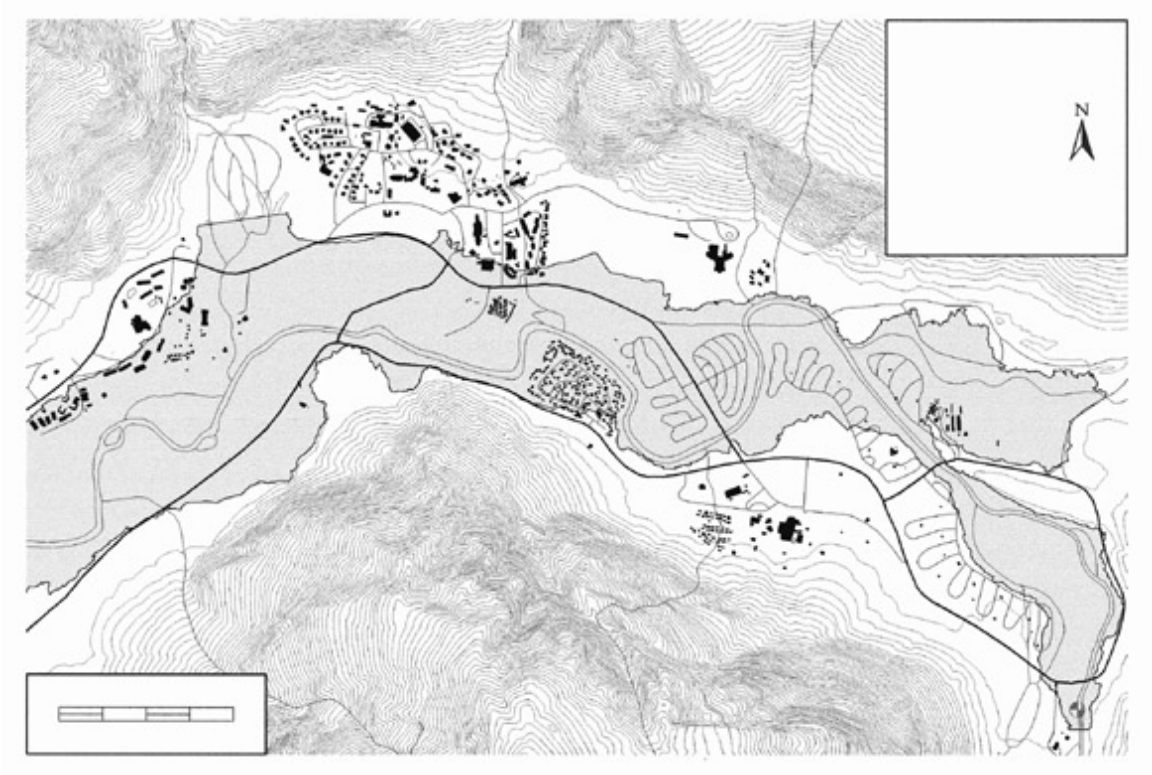


Figure G-5: Flowing east to west, the New Year's Day flood in 1997 covered the shaded area of the Yosemite Valley, including the buildings, roads, and parking lots indicated (*193*).

Flood of the Merced River: With heavy rains and warm temperatures falling on abundant snowpack on New Year's Day in 1997, the Merced River flooded its banks so extensively that Yosemite National Park closed its gates to visitors for 82 days (*194*). With the highest waters on record, the flood destroyed buildings, campgrounds, roads, sewer lines, and parking areas (Figure G-5). Standing water reached up to ten feet (three meters). Yosemite Valley lost half of its campsites (about 350), 200 concession employee housing units (439 bed spaces), 300 guest units (more than half of the accommodations) at the Yosemite Lodge, and 33 backcountry bridges (*195*). Highway 140 follows the Merced River corridor, and sections of this major access road

disappeared along 7.5 miles (12.1 kilometers) of the corridor, such that the road remained closed until Memorial Day weekend. Congress appropriated $176 million for flood recovery in June of 1997 (*196*). With complete reconstruction needed on Highway 140, engineers brought the road to modern safety standards of width and curvature, which can safely accommodate modern traffic, including large recreational vehicles. In light of the controversy of the Yosemite Valley Plan, some stakeholders question whether the improvements made in the name of safety and modern standards (Figure G-6) did not, in effect, increase the capacity of the road to accommodate a larger amount of bus traffic in the future when private vehicles are restricted from the park.



Figure G-6: Stakeholders have expressed concern that flood reconstruction has expanded capacity for vehicles entering the park along Highway 140.

The National Park Service response to these two events and the simultaneous adoption of the Yosemite Valley Plan, which some people considered was rushed in the face of flood reconstruction and the end of President Bill Clinton's term of office in January 2001, have generated controversy. U.S. House Representative George Radanovich, who represents the region and who was named head of the House subcommittee on national parks, challenges the Yosemite Valley Plan, considering it far more restrictive than necessary. He feels the public will demand private vehicle access and parking (*197*). Likewise, local stakeholders in surrounding counties and communities have questioned the efficiency with which Yosemite National Park has implemented restrictive policies.

Many people have laid claims on the lands of Yosemite since the time of American settlement, and development on park lands reflects a diversity of uses. The boundaries of the park contain such unusual operations as a commercial gas station, a golf course, and a federal court. Many such operations come from legacies prior to the formation of the national park. Even today, many stakeholders feel connected to the park and often hold opposing views about the best way to manage the park and preserve the lands. Five counties border Yosemite National Park, and stakeholders in each county consider their localities to offer the proper gateway to the park.

G.2.1 The Gateway Communities: Madera, Mariposa, Merced, Mono and Tuolumne Counties

With four adjacent counties (Madera, Mariposa, Tuolumne, and Mono) and a fifth county along a major highway accessing Yosemite, many communities consider themselves gateways to Yosemite National Park (Figure G-7). Merced County, the non-

adjacent county along an access highway, officially registered claim to call itself "Gateway to Yosemite," but localities across the region base their economies on the millions of tourists who travel through the region every year.

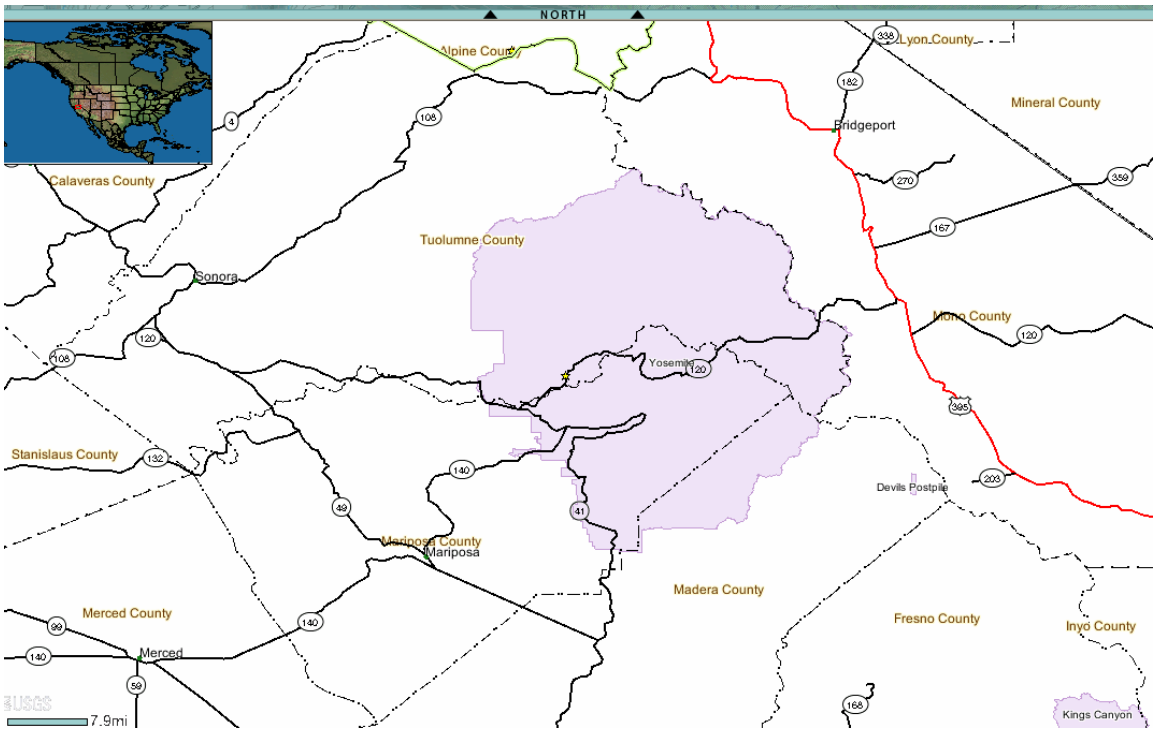


Figure G-7: Local communities surrounding Yosemite National Park.

Although Yosemite attracts millions of people each year and has international renown, all five of the contiguous counties around the national park have median household incomes below national and state averages (Table G-3). Madera, Mariposa, and Merced Counties also exceed state and national poverty rates and have seen poverty increase more rapidly in the decade between 1990 and 2000 than elsewhere. These numbers do not suggest booming local economies. While Mono and Tuolumne Counties have median household incomes lower than in the state and nation, county residents do

earn typical per capita incomes between $21,000 and $23,500, and per capita income has grown more rapidly in these counties than it has in the state and the nation. Census data suggest that these counties do not suffer from economic difficulties, but residents in these counties also do not enjoy comfortable economic advantages.

Table G-3: Community Characteristics in the 2000 Census and Change from 1990

	Madera County	Mariposa County	Merced County	Mono County	Tuolumne County	California
Population	123,109 +40%	17,130 +20%	210,554 +18%	12,853 +29%	54,501 +12%	33,841,648 +14%
Median Household Income	$36,286 +33%	$34,626 +37%	$35,532 +39%	$44,992 +41%	$38,725 +43%	$47,493 +33%
Per Capita Income	$14,682 +35%	$18,190 +39%	$14,257 +34%	$23,422 +45%	$21,015 +59%	$22,711 +38%
Population below Poverty	21.4% +3.9 pt	14.8% +2.1 pt	21.7% +1.8 pt	11.5% +1.6 pt	11.4% +2.3 pt	14.2% +1.7
Land Area sq miles (sq kilometers)	2,138.4 5,538.5	1,451.2 3,758.6	1,928.9 4,995.8	3,044.5 7,885.2	2,235.6 5,790.3	155,973.2 403,970.7

	Oakhurst	Mariposa	Merced	Mammoth Lakes	Groveland – Big Oak Flat	United States
Population	2,939 +13%	1,437 +28%	63,991 +14%	7,094 +48%	3,408 +26%	281,421,906 +13%
Median Household Income	$27,679 +10%	$18,144 +33%	$30,429 +23%	$44,570 +26%	$41,928 +26%	$41,944 +40%
Per Capita Income	$16,851 +16%	$22,436 +104%	$13,115 +28%	$24,526 +35%	$27,394 +45%	$21,587 +50%
Population below Poverty	17.3% +10.4	24.0% +10.2 pt	27.9% +2.8 pt	14.4% +5.9%	7.0% -2.1 pt	12.4% -0.7 pt
Land Area sq miles (sq kilometers)	5.9 (15.3)	3.2 (8.4)	16.1 (41.8)	24.6 (63.8)	21.8 (56.6)	3,537,438.4

6.2.1. Madera County and Oakhurst

South of Yosemite and along Highway 41, Oakhurst sits directly outside of the park in Madera County. Oakhurst has wide streets, large signs, and strip development characteristic of auto-oriented communities developed primarily in the latter half of the twentieth century (Figure G-8). With population increasing by 40 percent between 1990 and 2000, Madera County has experienced the fastest growth of any of the counties in the region, although Oakhurst itself only grew by thirteen percent.



Figure G-8: Oakhurst has an inherently auto-oriented design.

Oakhurst's original name, Fresno Flats, hints at one role that Oakhurst serves as a gateway to Yosemite: people arriving at Fresno Yosemite International Airport (FAT) pass through Oakhurst en route to the national park. Oakhurst sits 46 miles (74 kilometers) north of Fresno, and it sits just south of the entrance to Yosemite National Park with the closest access to Mariposa Grove and its giant sequoias.

6.2.2. Mariposa County and the City of Mariposa

In contrast to the auto-oriented character of Oakhurst, the city of Mariposa, which has the smallest population among Yosemite's gateway communities, markets a walking tour of its historic downtown. The County boasts the oldest weekly newspaper in continuous publication (the Mariposa Gazette, which started in January 1854), the oldest county courthouse in continuous use west of the Rocky Mountains (Mariposa County court House opened in 1854), and the oldest ski area still in use (Badger Pass was California's original ski area). The walkable downtown of Mariposa centers on Highway 140 (Figure G-9), which means that this historic area handles the modern traffic coming east from the interstate and Merced (Figure G-10). For local residents, Mariposa has established public transportation in the form of Mari-Go (Mariposa County Transit). Mari-Go offers dial-a-ride transportation on demand and serves a three-mile (4.8-kilometer) radius around Mariposa. A private business has also started taxi operations.

The city of Mariposa houses an economically disadvantaged population with a median household income of just $18,144. Household incomes in the city are growing at the same pace as in the state (33 percent growth over ten years), but per capita income grew by 104 percent. At the same time, the population living below poverty in Mariposa more than doubled in absolute numbers between the 1990 and the 2000 Censuses (Table G-3). These trends suggest the local economy is stratifying with extremely wealthy residents and a large base population living below poverty.



Figure G-9: Downtown Mariposa centers on Highway 140 en route to the park.



Figure G-10: Mariposa sees streams of private vehicles heading to Yosemite.

6.2.3. Merced County and the City of Merced

The city of Merced, by far the largest of the communities in the Yosemite region, had a population of 63,991 in 2000 and projects to grow to more than 80,000 residents by 2010. Local leaders have strategized such growth. Merced focused effort into creating and maintaining a vital downtown for decades, investing $2 million into beautification of the downtown business district in 1980 in hopes of stimulating private investment in the area, and the county has secured the official right to call itself the "gateway to Yosemite" (Figure G-11). Merced now boasts six employers providing more than 500 jobs each (Quebecor Color Press, Bianchi and Sons, Pacific Telesis, Merced College, Merced School District, and the County of Merced). Despite these successes, both the city of Merced and Merced County have the highest proportion of population living below poverty in the region (Table G-3).

Beyond the employment and population already associated with higher education at Merced College, Merced is newly opening the tenth campus of the University of California system, which is anticipated to bring a large youth population to the area with its characteristic financial need for public transit and its sense of environmental protection. The new campus buildings are emerging on formerly open land on the lake north of downtown Merced (Figure G-12).



Figure G-11: Merced has strategized and invested in downtown development.



Figure G-12: The opening of the University of California at Merced is bringing a large youth population to formerly undeveloped land.

6.2.4. Mono County, Lee Vining, and Mammoth Lakes

With a mountain range passing from north to south in Yosemite National Park, Mono County on the east side of Yosemite sits in isolation from the other counties in the region. Winter closures of Tioga Road, as well as nearby state highway passes, leave Mono County practically inaccessible from the west in the winter except by air. Conversely, Mono has the advantage of offering the only means of access to Yosemite from the east, which includes Carson City, Nevada and the Lake Tahoe region.

Lee Vining on Highway 395 sits directly outside of the Yosemite National Park's east entrance from Highway 120. Bisected by a wide highway, this small community supports, but does not have reason to pursue, the idea of transit. The community has an auto orientation (Figure G-13), and an interviewee from the area could only recall one visitor using transit to access Yosemite.



Figure G-13: Lee Vining, the closest community to Yosemite's east entrance, receives visitors in private vehicles.

Despite the apparent lack of need for transit in Lee Vining, Mono has actively advocated regional transit into Yosemite. The town of Mammoth Lakes has driven the interest. Located 35 miles (56 kilometers) south on Highway 395 from Yosemite's east entrance, Mammoth Lakes does not sit particularly close to the park, but with a population already over 7,000, the resort community has both one of the highest populations and the highest growth rate (48 percent) of the gateway communities in the region (Table G-3). Where Table G-3 numerically indicates superlative median household income and per capita income in Mono County and Mammoth Lakes, the wealth expresses itself physically in the changing streetscape of the town (Figure G-14). New pedestrian trails, reconstruction of roads, and new luxury resorts evidence themselves on the roadsides. Mammoth Lakes acquired the Mammoth Yosemite Airport (MMH) from Mono County in 1997 (*198*), and the Town is actively seeking to expand use of the airport with scheduled service (Figure G-15).



Figure G-14: Mammoth Lakes is expanding its tourism resources.



Figure G-15: Mammoth Lakes sees its airport as a resource for attracting visitors.

Local leaders in Mammoth Lakes are actively pursuing ways to plan for economic development and transportation. Local planners are engaged in a large visioning process to update the 1984 *General Plan*. In 2001, the Town Council adopted a revised transportation and circulation element of the plan that specified the following goal (*199*):

> Objectives and policies for the Town primarily focus on providing safety improvements to exiting highways and roadways, and developing a trail system for use by non-motorized methods of transportation, such as bicycling, walking, horseback riding, and cross country skiing, and promoting public transit. These objectives and policies support the Town's overall goal of minimizing the use of motor vehicles in order to improve air quality, support a pedestrian friendly community, avoid the need for significant street improvements, and enhance the mountain resort image of the Town.

Evidence of intermodal transportation initiatives appear throughout the community. Local ski resorts bring tourists to the area and offer public transit service as an amenity (Figure G-16). Inyo Mono Transit operates dial-a-ride service to provide intercity service in nearby counties, and the U.S. Forest Service funds a bus that shuttles visitors to Red's Meadow and Devil's Postpile National Monument from Mammoth Mountain Inn. Beyond local transportation, community leaders have envisioned opportunity in keeping tourists for an extra night at the resorts if transit can provide access to Yosemite.



Figure G-16: As Mammoth Lakes grows, it is establishing ways to travel without a private vehicle, such as a pedestrian path (left) and a local shuttle system (right).

6.2.5. Tuolumne County and Groveland

Tuolumne County has transitioned its economy from a base of timber and mining to a focus on service, manufacturing, tourism, and retail. Major employers providing over 500 jobs focus on public service: Sonora Community Hospital, Sierra Conservation Center, the United States Government, the State of California, Tuolumne County, and Tuolumne County Schools. Compared with the surrounding region, the Tuolumne economy has weathered its changes well. Tuolumne has the highest per capita and median household income of any of the counties west of Yosemite, and both measures of income grew at a faster rate in Tuolumne than in the other western counties between the 1990 and 2000 Censuses (Table G-3).

Tuolumne County attracts tourists with Yosemite National Park to the south and Gold Country's heritage of the 1849 California Gold Rush in the northern part of the county. County officials report that the diversity of attractions have helped the local economy. Despite low visitation at Yosemite in recent years, tourist interest in Gold Country has soared. Cities in southern Tuolumne have suffered from Yosemite's lag, but on the whole, the county has done well in the tourism industry.

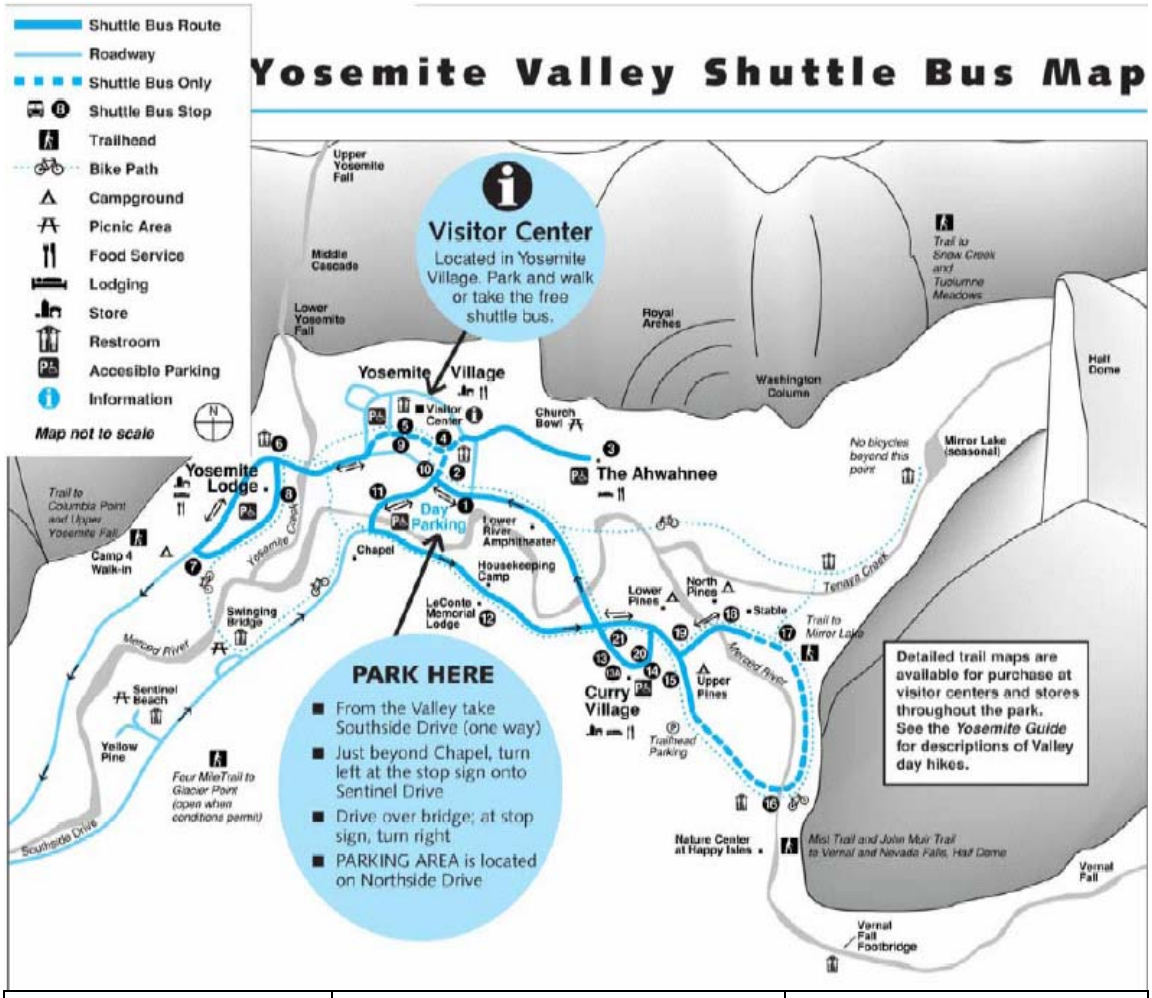
Tuolumne's primary gateway to Yosemite, Groveland, sits in the mountains near the park entrance off of Highway 120. As the fastest access route from San Francisco, Highway 120 receives visitors from the major metropolitan area 142 miles (229 kilometers) from Groveland. Per capita income in Groveland surpasses even the state average, and all other gateway communities in the region have poverty rates multiples higher than Groveland's.

G.3 The Yosemite Valley Visitor Shuttle

Inside Yosemite National Park, the park's concessioner operates a shuttle service for internal circulation, served 2.7 million passenger trips in 2002. On the floor of Yosemite Valley where parking is scarce and traffic is heavy, the Yosemite Valley Visitor Shuttle Service operates throughout the year from 7:00 am to 10:00 pm every day with buses departing every 15 minutes. A single bus route circles the valley floor on a 60-minute roundtrip loop, crossing its own path in a figure eight that reportedly confuses some visitors. Along the easternmost section of this bus route, private vehicle restrictions mean that the internal shuttle offers the only motorized access for visitors (

Figure G-17). Free shuttle buses also operate seasonally in Tuolumne Meadows and between Wawona and the Mariposa Grove. For a fee, visitors can begin long hikes by taking a one-way shuttle along the Tioga Road or out to Glacier Point.

The 1999 visitor survey reviewed passenger response to the Yosemite Valley shuttle route (*185*). It found that the majority (60 percent) of shuttle passengers stayed as overnight guests, 31 percent of riders were visiting for the day, and employees comprised nine percent of passengers. Exit surveys showed that thirteen percent of visitors who used the Valley shuttle experienced problems with it in terms of crowding, inadequate information, or insufficient frequency of service. Compared to transit surveys in other national parks, this service receives a substantially large percentage of complaints.



1. Yosemite Village/Day Parking 2. Yosemite Village 3. The Ahwahnee Hotel 4. Yosemite Village / Degnam's Complex 5. Visitor Center 6. Lower Yosemite Fall 7. Camp 4 / Upper Yosemite Fall Trailhead	8. Yosemite Lodge 9. Visitor Center 10. Yosemite Village 11. Sentinel Bridge / Yosemite Chapel 12. Housekeeping Camp / LeConte Memorial Lodge 13. Curry Village Rental Center a. Curry Village Registration	14. Curry Village Parking 15. Upper Pines Campground 16. Happy Isles/John Muir Trailhead 17. Mirror Lake Junction 18. Stable 19. Lower Pines Campground 20. Curry Village Parking 21. Curry Village Rental Center

Figure G-17: Yosemite Valley Visitor Shuttle route.

Internal park shuttle service operates on a fleet of 1986 diesel buses (Figure G-18). This fleet recently replaced a fleet of 1983 diesel buses, and several stakeholders question the choice of vehicle for the replacement fleet, especially given that Yosemite National Park cites air quality as a motivation for transit in and around the park. These buses visibly exhaust diesel particles into the air, and stakeholders report that the smell of diesel pollution characteristically hangs in the air through the peak summer months. With talk of eliminating private vehicles from the Yosemite Valley, some stakeholders question whether the National Park Service has demonstrated that it can protect air quality better than the private vehicle fleet of California, which must adhere to the most stringent emissions standards in the nation. In response to these concerns, Yosemite is currently acquiring a new fleet of cleaner fuel buses.



Figure G-18: The Yosemite Valley Visitor Shuttle runs with a 1986 diesel fleet.

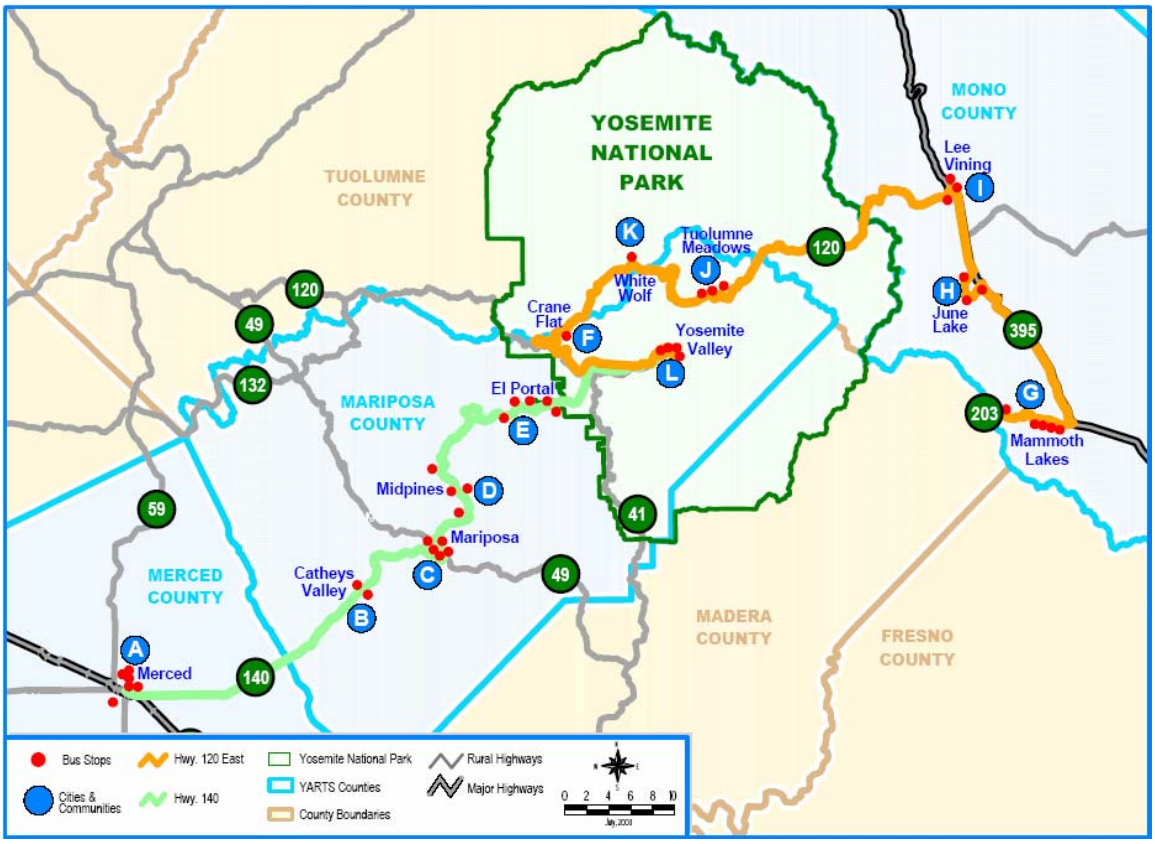
G.4 The Yosemite Area Regional Transportation System (YARTS)

G.4.1 Current Conditions

Throughout the year, the Yosemite Area Regional Transportation System (YARTS) sends 40-passenger buses into Yosemite National Park from the gateway communities. YARTS operates two routes (Figure G-19). From the west, buses travel from downtown Merced, which includes an airport and an Amtrak passenger train station (Figure G-20). These buses travel eastward through Mariposa and El Portal into the park. On the east side of the park, the route starts at Mammoth Lakes south of Yosemite National Park, comes north on Highway 395 through Lee Vining, and travels the Tioga Road through the mountains to reach Yosemite Valley. With the Tioga Road closed in winter, YARTS runs east along Highway 120 only in the summer season.

YARTS operates a low-frequency service with six round runs into the park daily from the west (Table G-4); visitors hoping to spend a half day in the park only have one chance to leave the park before 4:15 p.m.. Such low frequency requires visitors to plan their schedules carefully and watch the time closely when engaged in park activities. Even so, two major factors cause people to change their plans unvoluntarily, and people frequently must wait more than two hours for the next bus:

- Buses fill in the evening when employees commute home. Because the buses travel winding mountain roads, YARTS cannot safely allow people to stand on the bus, and drivers tell people to wait for the next bus.
- Sometimes visitors get confused making bus connections, particularly with the figure-eight route on the Yosemite Valley Shuttle. The low frequency leaves little forgiveness for mistakes in planning.



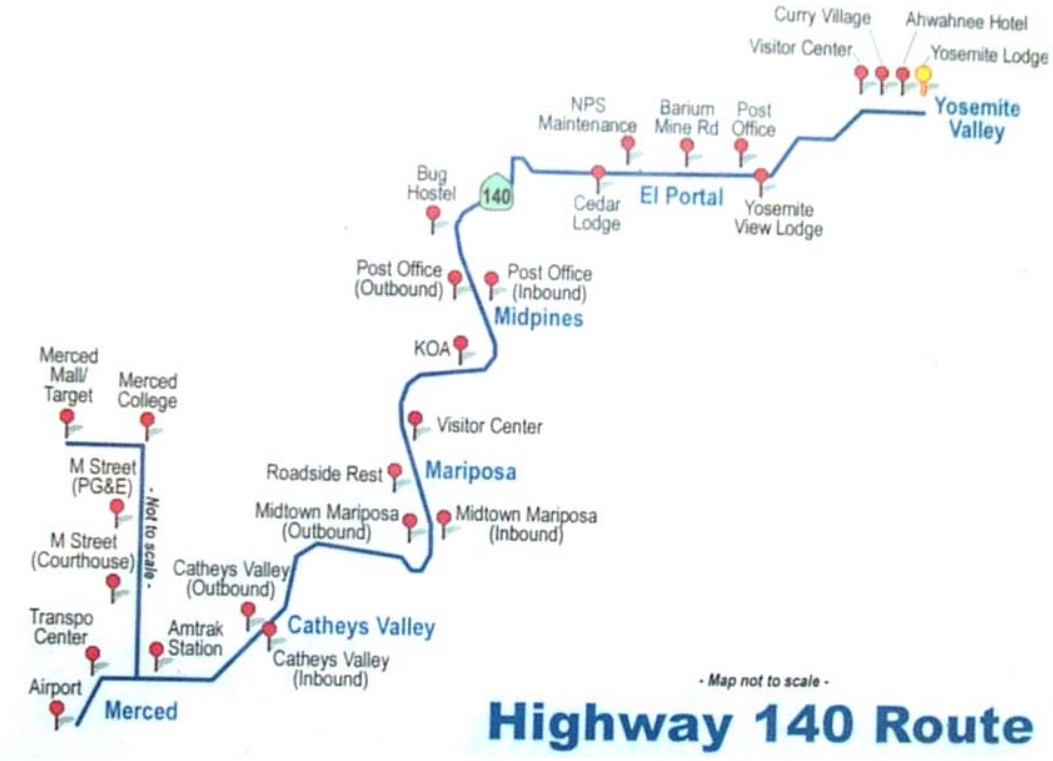


Figure G-19: YARTS routes in the region (top) and in detail along Highway 140 (bottom).

Table G-4: Arrival and Departure in 2003 at the Yosemite Lodge from Highway 140

Arrival	Departure
7:38 a.m.	10:00 a.m.
8:11 a.m.*	
9:45 a.m.	4:15 p.m.
11:48 a.m.	4:35 p.m.
1:10 p.m.	5:20 p.m.
8:00 p.m.**	8:15 p.m.

* does not operate weekends or holidays.
** summer only



Figure G-20: YARTS starts routes from the transportation center in Merced.

Research and experience with transit has shown that the long wait times, as at Yosemite, act as a strong deterrent to riding transit. When deciding how to travel, potential transit passengers consider both the time spent waiting at a bus stop and the travel time accessing or riding the bus to travel time by car. Researchers studying travel behavior have determined that people perceive a greater burden for out-of-vehicle wait time, as opposed to time spent sitting on a bus or going to the bus stop. If, at Yosemite, a person must wait for a bus for some time and then wait an extra two hours and twenty

minutes for the next bus because the first had too many passengers, that person will evaluate that wait time harshly when deciding whether to use the YARTS service again or recommend it to a friend.

In addition to infrequent service, passengers must consider long travel times (Table G-5 and Table G-6). Travel from Merced College to Yosemite Lodge takes three hours from end to end on an 80-mile (129-km) route. With nearly four hours required each way from the east, YARTS runs only once daily over Tioga Road. It departs at 7:00 a.m. from Mammoth Mountain Inn, and the return trip begins at 5:00 p.m. from Yosemite Lodge.

YARTS depends on contributions from participating counties and from fare revenue. People can buy tickets in a number of ticket options. Table G-7 shows basic round-trip fares for 2003. Beyond these fares, one child less than sixteen years old can ride for free with a paying adult, unaccompanied children under sixteen pay special child fares, and people at least 62 years of age pay a special senior fare. People can purchase a multi-use ticket, which will allow three days of travel for the cost of two, or three people can travel on one day for the cost of two. YARTS allows some retailers to offer additional discount options, but other retailers choose not to offer multiple discount options because the options add retail complexity. The official YARTS ticket policy published on the Internet advises people to "see ticket sellers for complete details," and no information shows which retail outlets will offer better discounts. None of the interviewees reported problems arising from visitors discovering inconsistency in the availability of discounts.

Table G-5: Travel Times on YARTS along Highway 140 West of Yosemite

	Yosemite Park				El Portal					Mariposa/Midpines						Merced/Cathey's Valley						
	Yosemite Lodge	Ahwahnee Hotel	Curry Village	Valley Visitors Center	Yosemite View Lodge	El Portal Post Office	Barium Mine Road	NPS Maintenance	Cedar Lodge	Bug Hostel	Midpines Post Office	KOA	Visitors Center	Roadside Rest	Midtown Mariposa	Cathey's Valley	Courthouse (M St.)	Merced AMTRAK	Merced Transpo	M Street (PG&E)	Merced Mall/Target	Merced College
Yosemite Lodge		0:05	0:10	0:15	0:48	0:51	0:54	0:57	1:01	1:25	1:29	1:32	1:42	1:45	1:48	2:05	2:35	2:42	2:45	2:53	2:55	3:00
Ahwahnee Hotel	0:05		0:05	0:10	0:43	0:46	0:49	0:52	0:56	1:20	1:24	1:27	1:37	1:40	1:43	2:00	2:30	2:37	2:40	2:48	2:50	2:55
Curry Village	0:10	0:05		0:05	0:38	0:41	0:44	0:47	0:51	1:15	1:19	1:22	1:32	1:35	1:38	1:55	2:25	2:32	2:35	2:43	2:45	2:50
Valley Visitors Center	0:15	0:10	0:05		0:33	0:36	0:39	0:42	0:46	1:10	1:14	1:17	1:27	1:30	1:33	1:50	2:20	2:27	2:30	2:38	2:40	2:45
Yosemite View Lodge	0:48	0:43	0:38	0:33		0:03	0:06	0:09	0:13	0:37	0:41	0:44	0:54	0:57	1:00	1:17	1:47	1:54	1:57	2:05	2:07	2:12
El Portal Post Office	0:51	0:46	0:41	0:36	0:03		0:03	0:06	0:10	0:34	0:38	0:41	0:51	0:54	0:57	1:14	1:44	1:51	1:54	2:02	2:04	2:09
Barium Mine Road	0:54	0:49	0:44	0:39	0:06	0:03		0:03	0:07	0:31	0:35	0:38	0:48	0:51	0:54	1:11	1:41	1:48	1:51	1:59	2:01	2:06
NPS Maintenance	0:57	0:52	0:47	0:42	0:09	0:06	0:03		0:04	0:28	0:32	0:35	0:45	0:48	0:51	1:08	1:38	1:45	1:48	1:56	1:58	2:03
Cedar Lodge	1:01	0:56	0:51	0:46	0:13	0:10	0:07	0:04		0:24	0:28	0:31	0:41	0:44	0:47	1:04	1:34	1:41	1:44	1:52	1:54	1:59
Bug Hostel	1:25	1:20	1:15	1:10	0:37	0:34	0:31	0:28	0:24		0:04	0:07	0:17	0:20	0:23	0:40	1:10	1:17	1:20	1:28	1:30	1:35
Midpines Post Office	1:29	1:24	1:19	1:14	0:41	0:38	0:35	0:32	0:28	0:04		0:03	0:13	0:16	0:19	0:36	1:06	1:13	1:16	1:24	1:26	1:31
KOA	1:32	1:27	1:22	1:17	0:44	0:41	0:38	0:35	0:31	0:07	0:03		0:10	0:13	0:16	0:33	1:03	1:10	1:13	1:21	1:23	1:28
Visitors Center	1:42	1:37	1:32	1:27	0:54	0:51	0:48	0:45	0:41	0:17	0:13	0:10		0:03	0:06	0:23	0:53	1:00	1:03	1:11	1:13	1:18
Roadside Rest	1:45	1:40	1:35	1:30	0:57	0:54	0:51	0:48	0:44	0:20	0:16	0:13	0:03		0:03	0:20	0:50	0:57	1:00	1:08	1:10	1:15
Midtown Mariposa	1:48	1:43	1:38	1:33	1:00	0:57	0:54	0:51	0:47	0:23	0:19	0:16	0:06	0:03		0:17	0:47	0:54	0:57	1:05	1:07	1:12
Cathey's Valley	2:05	2:00	1:55	1:50	1:17	1:14	1:11	1:08	1:04	0:40	0:36	0:33	0:23	0:20	0:17		0:30	0:37	0:40	0:48	0:50	0:55
Courthouse (M St.)	2:35	2:30	2:25	2:20	1:47	1:44	1:41	1:38	1:34	1:10	1:06	1:03	0:53	0:50	0:47	0:30		0:07	0:10	0:18	0:20	0:25
Merced AMTRAK	2:42	2:37	2:32	2:27	1:54	1:51	1:48	1:45	1:41	1:17	1:13	1:10	1:00	0:57	0:54	0:37	0:07		0:03	0:11	0:13	0:18
Merced Transpo	2:45	2:40	2:35	2:30	1:57	1:54	1:51	1:48	1:44	1:20	1:16	1:13	1:03	1:00	0:57	0:40	0:10	0:03		0:08	0:10	0:15
M Street (PG&E)	2:53	2:48	2:43	2:38	2:05	2:02	1:59	1:56	1:52	1:28	1:24	1:21	1:11	1:08	1:05	0:48	0:18	0:11	0:08		0:02	0:07
Merced Mall/ Target	2:55	2:50	2:45	2:40	2:07	2:04	2:01	1:58	1:54	1:30	1:26	1:23	1:13	1:10	1:07	0:50	0:20	0:13	0:10	0:02		0:05
Merced College	3:00	2:55	2:50	2:45	2:12	2:09	2:06	2:03	1:59	1:35	1:31	1:28	1:18	1:15	1:12	0:55	0:25	0:18	0:15	0:07	0:05	

Table G-6: Travel Times on YARTS along Highway 120 East of Yosemite

	Mammoth Lakes					June Lake			Lee Vining			Tuolumne Meadows			Yosemite		
	Mammoth Mountain Inn	Juniper Springs Summit	Old Mammoth Road	HWY 203, Shilo Inn	HWY 203, Mammoth Mtn RV Park	Scenic Byway Kiosk	June Mountain Ski Parking	Silver Lake Parking Lot	Best Western Motel	Forest Service Visitor Center	Tioga Mobil Gas Mart	Tuolumne Meadows Store	Tuolumne Meadows Visitor Ctr	Cathedral Trailhead	White Wolf Lodge	Crane Flat Gas Station	Yosemite Visitor Center
Mammoth Mountain Inn		0:08	0:13	0:15	0:17	0:30	0:40	0:55	1:10	1:13	1:18	2:00	2:05	2:10	2:50	3:20	3:50
Juniper Springs Summit	0:08		0:05	0:07	0:09	0:22	0:32	0:47	1:02	1:05	1:10	1:52	1:57	2:02	2:42	3:12	3:42
Old Mammoth Road	0:13	0:05		0:02	0:04	0:17	0:27	0:42	0:57	1:00	1:05	1:47	1:52	1:57	2:37	3:07	3:37
HWY 203, Shilo Inn	0:15	0:07	0:02		0:02	0:15	0:25	0:40	0:55	0:58	1:03	1:45	1:50	1:55	2:35	3:05	3:35
HWY 203, Mammoth Mountain RV Park	0:17	0:09	0:04	0:02		0:13	0:23	0:38	0:53	0:56	1:01	1:43	1:48	1:53	2:33	3:03	3:33
Scenic Byway Kiosk	0:30	0:22	0:17	0:15	0:13		0:10	0:25	0:40	0:43	0:48	1:30	1:35	1:40	2:20	2:50	3:20
June Mountain Ski Area Parking Lot	0:40	0:32	0:27	0:25	0:23	0:10		0:15	0:30	0:33	0:38	1:20	1:25	1:30	2:10	2:40	3:10
Silver Lake Parking Lot	0:55	0:47	0:42	0:40	0:38	0:25	0:15		0:15	0:18	0:23	1:05	1:10	1:15	1:55	2:25	2:55
Best Western Motel	1:10	1:02	0:57	0:55	0:53	0:40	0:30	0:15		0:03	0:08	0:50	0:55	1:00	1:40	2:10	2:40
Forest Service Visitor Center	1:13	1:05	1:00	0:58	0:56	0:43	0:33	0:18	0:03		0:05	0:47	0:52	0:57	1:37	2:07	2:37
Tioga Mobil Gas Mart	1:18	1:10	1:05	1:03	1:01	0:48	0:38	0:23	0:08	0:05		0:42	0:47	0:52	1:32	2:02	2:32
Tuolumne Meadows Store	2:00	1:52	1:47	1:45	1:43	1:30	1:20	1:05	0:50	0:47	0:42		0:05	0:10	0:50	1:20	1:50
Tuolumne Meadows Visitor Center	2:05	1:57	1:52	1:50	1:48	1:35	1:25	1:10	0:55	0:52	0:47	0:05		0:05	0:45	1:15	1:45
Cathedral Trailhead	2:10	2:02	1:57	1:55	1:53	1:40	1:30	1:15	1:00	0:57	0:52	0:10	0:05		0:40	1:10	1:40
White Wolf Lodge	2:50	2:42	2:37	2:35	2:33	2:20	2:10	1:55	1:40	1:37	1:32	0:50	0:45	0:40		0:30	1:00
Crane Flat Gas Station	3:20	3:12	3:07	3:05	3:03	2:50	2:40	2:25	2:10	2:07	2:02	1:20	1:15	1:10	0:30		0:30
Yosemite Visitor Center	3:50	3:42	3:37	3:35	3:33	3:20	3:10	2:55	2:40	2:37	2:32	1:50	1:45	1:40	1:00	0:30	

Some stakeholders see these individual ticket prices as a deterrent for families, but partners in YARTS are trying to address that issue in a few ways. At first glace, a family of four traveling from Merced or Mammoth Lake to Yosemite must pay four times the ticket price of twenty dollars… a total of $80. Tangibly, children, seniors, and groups of three get discounts, so people have several discounting options available to them. Pragmatically, YARTS supporters point out that private vehicle travel costs come comparably close. Passengers on YARTS need not pay entrance fees to Yosemite National Park (although people discuss the possibility of a one-dollar entrance fee or more), and most people do not consider the cost of operating a private vehicle.

Table G-7: Round-Trip Single-Passenger Fares on YARTS for 2003

Highway 140 West of Yosemite	Merced	Cathey's Valley	Mariposa	Midpines	El Portal	Yosemite
Merced		(2) $3	(6) $7	(6) $7	(9) $10	(14) $20
Cathey's Valley	(2) $3		(5) $6	(5) $6	(6) $7	(14) $15
Mariposa	(6) $7	(5) $6		$1	(6) $7	(9) $10
Midpines	(6) $7	(5) $6	$1		(6) $7	(9) $10
El Portal	(9) $10	(6) $7	(6) $7	(6) $7		(6) $7
Yosemite	(14) $20	(14)$15	(9) $10	(9) $10	(6) $7	

Highway 120 East of Yosemite	Mammoth Lake	June Lake	Lee Vining	Tuolumne Meadows	White Wolf	Crane Flat	Yosemite Valley
Mammoth Lake		(3) $5	(5) $10	(10) $20	(10) $20	(10) $20	(10) $20
June Lake	(3) $5		(3) $5	(8) $15	(10) $20	(10) $20	(10) $20
Lee Vining	(5) $10	(3) $5		(5) $10	(10) $20	(10) $20	(10) $20
Tuolumne Meadows	(10) $20	(8) $15	(5) $10		(5) $10	(10) $20	(10) $20
White Wolf	(10) $20	(10) $20	(10) $20	(5) $10		(5) $10	(5) $10
Crane Flat	(10) $20	(10) $20	(10) $20	(10) $20	(5) $10		(3) $5
Yosemite Valley	(10) $20	(10) $20	(10) $20	(10) $20	(5) $10	(3) $5	

Fares for children and seniors are indicated within parentheses

Several interviewees said the prices of tickets on YARTS deter potential passengers, but whereas people notice out-of-pocket expenses, people do not notice hidden expenses. YARTS runs routes of 80 miles (129 km), which means that riding the bus saves people the cost of mileage on their private vehicles. A round-trip ticket on the bus from Merced to Yosemite costs $20 for a single person. Roundtrip mileage corresponds at the federal government rate of reimbursement for mileage ($0.365/mile in 2002 and $0.375/mile in 2004) to a 2004 trip cost of $60 plus a $20 total entrance fee for as many people as a car carries. Many stakeholders in the local area complain about the expense of fares for the system, but few recognize the comparable cost of private vehicle transportation because those costs do not come directly from people's pockets on the day of the trip.

Uncertain dedication of financial resources to the system has manifested in a lack of investment in rolling stock, so the system's vehicles do not portray the same presence found with transit systems serving other parks. The transit operator, Via Transportation, operates several styles of buses on the routes (Figure G-21). Some have the YARTS logo painted clearly on them, whereas some only have the logo posted over the Via logo and some drivers merely post the YARTS logo as a sign in the window of a bus painted with the Via designation. Sometimes, the poster does not even appear, leaving visitors unfamiliar with the area without the sense of presence of YARTS. To Via's credit, part of the confusion in appearance arises out of generosity. Via runs buses into the park as a service arrangement with Amtrak, and Via management allows YARTS passengers to ride on these buses, rather than wait for the next official YARTS bus. In effect, this un-contracted arrangement increases YARTS capacity and frequency substantially.



Figure G-21: Yosemite's YARTS buses have an identity crisis with several different appearances.

The lack of presence of the system manifests in other ways, as well. Substantial infrastructure appears only at some stops. A small sign offers the only indication of many fixed stops (Figure G-22), and where infrastructure does exist, it does not have a consistent appearance to capture the attention of visitors (Figure G-23). While schedule flyers appear at many hotels, visitors cannot pick up system maps to get a graphic indication of the routes.



Figure G-22: YARTS infrastructure in Mariposa appears as single signs.

Another important piece of infrastructure exists, but is not well advertised: lockers. People spending the day in the park without a private vehicle trunk cannot conveniently pack food supplies, buy souvenirs, and hike on trails without some means of personal storage. Stakeholders reported lockers available to visitors, but this service did not make itself evident in tourist information.



Figure G-23: The quality of infrastructure and passenger amenity supporting YARTS varies from standing in the grass to sheltered seating.

G.4.2 History: Goals and Lessons

The 1980 *General Management Plan* envisioned increased public transportation both within the park and accessing park lands. Yosemite's planners encouraged regional and statewide cooperative planning to promote public transportation with scheduled routes from Lee Vining, Merced, Fresno, Oakhurst, Mariposa, and Groveland (*186*). This regional transportation required a regional collaboration. The National Park Service, the five surrounding counties, Caltrans (the California State Highway Department), California's Department of Travel and Tourism, the U.S. Forest Service, and eventually

the Federal Highway Administration (FHWA) came together through a 1992 Memorandum of Understanding to address regional circulation. The Memorandum of Understanding identified four primary goals (*200*):

- "Improve transportation service within the Yosemite region;
- "Reduce dependence on the single family vehicle within the Yosemite region;
- "Reduce air quality impacts in the Yosemite region; and,
- "Improve economic viability compatible with the character of the Yosemite region."

As the first tangible result of the collaboration, YARTS introduced intelligent transportation systems (ITS) to the Yosemite region in 1996 with the Yosemite Area Traveler's Information System (YATI). The Yosemite Area Traveler's Information System (YATI) introduced changeable message signs, highway radio information, a website, and information kiosks to provide real time messaging to support a regional transit network (*191*). After the initial trial installation of the system, transportation agencies discontinued support for many of the systems introduced. In an effort to save operational costs, changeable message signs now remain dark even in high season (Figure G-24), but ITS infrastructure remains in place for the day when visitation returns or surpasses the peak years of the mid-1990s. The YATI experience potentially indicates several lessons. On the most pragmatic level, the operational expense of transportation technology requires a minimum threshold of congestion to make the system worth supporting. Conversely, YATI has shown a unique flexibility of ITS: when low demand renders the system a luxury, rather than a necessity, transportation organizers can cut operating costs by turning off the technology until the traveling public needs it again.

This argument ignores the need to justify the up-front capital cost of installing the equipment by using the system beyond initial project evaluation. Politically, the situation might also demonstrate what happens when local leaders have not fully bought into the usefulness of the technology. In such cases, local decision makers can quickly allocate resources needed to maintain the technology to other projects deemed a higher priority.



Figure G-24: The Yosemite Area Traveler's Information System (YATI) signs have darkened since the demonstration project's funding ended.

A 1999 Joint Powers Agreement between Counties of Merced, Mariposa, and Mono launched transit as YARTS, and contracted service began in 2000. Partners in YARTS explicitly stated in the collaboration's mission that the regional transit service would not facilitate the removal of private vehicles from Yosemite Valley:

> YARTS will provide a positive alternative method of access to Yosemite National Park, carrying visitors, employees and residents. YARTS service is not intended to replace auto access or trans-Sierra travel, but is intended to provide a viable alternative that offers a positive experience, emphasizing comfort and convenience for riders, while guaranteeing access into the Park.

Local governments cover the entire operational subsidy needed beyond fare revenue, which suggests that YARTS depends on the success of regional collaboration; however, YARTS began as a five-county partnership and ended as a three-county partnership with limited resources. Madera County left the YARTS management board in 1999 because local residents believed Yosemite National Park wanted to use YARTS to facilitate the removal of private vehicles from Yosemite Valley, which would lead to negative impact on the local economy (*201*). Tuolumne County subsequently left the process, as well.

YARTS partners identified challenges to establishing regional transit service (*191*):

- Day visitors, who make up a large portion of park visitors, are far less likely to use transit than people who stay the night in gateway communities.
- A large number of visitors to parks will travel one-way through the park on an ongoing journey on the Tioga Road. Transit suits people who start and end their visits from the same location.
- Most Americans travel to parks in private vehicles.
- While international visitors are accustomed to using transit, accommodating language needs for the service and interpretation creates a challenge.
- Park visitors typically come from a high economic bracket, which implies that they have time sensitivity. Though they might support transit in principle, they might not plan to ride it themselves.

- Few people visit national parks alone. At Yosemite, nearly half of the visitors arrive in pairs and another 30 percent arrive in groups of three or four; only five percent travel by themselves. Implementing transit in this environment means replacing high occupancy vehicles with higher occupancy vehicles.[20] One bus can replace fewer private vehicles than transportation planners in non-recreational contexts typically expect.
- Yosemite's entrance fee structure favors private vehicles admitting each vehicle for $20, regardless of the number of people in it.
- No ongoing funding source exists. Governments typically allocate funds on the basis of population, which rural gateway communities cannot justify. Visitation should fall under consideration for allocation, as well. Until recently, the federal government prohibited the National Park Service from spending money on service outside the boundaries of federal land. The government made exception for Zion National Park to operate a new regional transit service.

Beyond these general problems identified early, opponents of YARTS who worked closely with the partnership have a variety of arguments against the service. These arguments address the intentions and the management of the regional collaboration.

- **Freedom of access:** Is the administration of Yosemite National Park using YARTS to get one step closer to eliminating private vehicles in Yosemite Valley? National Park Service representatives deny a hidden agenda, but the currently-active *General Management Plan* of 1980 still declares in writing the intention to

[20] The 1999 Visitor Use Study showed average vehicle occupancy between 2.8 and 2.9 passengers.

remove private vehicles from the valley. Interviewees said statements made during the planning stages of YARTS echoed the 1980 agenda. Opponents of YARTS feel that Yosemite National Park spokespeople would say in public that YARTS is not intended to eliminate private vehicle access, but written documents and management actions indicate the contrary.

- **Pragmatism:** The simple topography of the area (winding mountain roads eliminating the possibility for standees at peak demand and raising the specter of motion sickness) makes the park less conducive to vehicle restrictions. Imposing bus rides on visitors over long distances and difficult terrain could create difficult conditions for families with tired children and other situations. Interviewees mentioned specific examples of families dealing with dirty diapers or sick children, as well as general travelers with a headache facing a long bus ride on winding roads. Personal freight (picnic baskets and hiking gear) also require space to reduce the capacity benefits of buses.
- **Unbalanced service allocation:** One of the two counties that dropped out of the five-county partnership cited an imbalance of service allocation to other counties in disproportion to the support (financial and otherwise) requested from all counties. The Merced County Association of Governments took responsibility for organizing YARTS, which, in effect, gave Merced the strongest role in making decisions. Tuolumne and Madera County felt that disproportionate service allocation was going to the east-west corridor, but with three counties on that corridor, board votes consistently went with the majority (three to two) in favor of east-west service.

- **Cost to visitors:** Middle class families cannot afford to pay the high fares of YARTS, and the long bus rides and dwell times to collect passengers will reduce the amount of time they can spend in the park.
- **Safety and disaster recovery:** Does the rural area around the park have sufficient emergency resources to handle the situation if a bus goes off the side of a mountain? Recovering a single passenger vehicle and airlifting a few injured occupants to a hospital is much more manageable than recovering a bus and large numbers of people needing emergency medical attention. Ironically, a bus carrying the park superintendent and his wife lost control and went off the road in the month following the site visit for this research project. No serious injuries occurred (*202*).
- **Hidden costs of the system:** Making local contributions worries one of the counties that dropped out of YARTS. Tuolumne County says that if it demonstrates a need for transit in order to receive transit funding for YARTS, but YARTS fails, the county will lose eligibility for some road improvement money until it provides transit service.

Harsh feelings, contention, and mistrust now cross county lines, although some of the counties have pulled together behind the transit service. In losing two county partners, YARTS also lost the financial support of those counties that could have helped shuttle service develop. For all of the arguments for and against the YARTS system, the most evident problems relate to long-standing difficulties with communication, trust, and truly inclusive participation. Consistently in interviews, research participants second-guessed motivations of other stakeholders and described scenarios of political gains and losses for

various interests. Fortunately, stakeholders expressed a general sense of improving communication now, particularly with the new superintendent at Yosemite National Park and his personal orientation toward interacting with the community.

G.5 Impacts

G.5.1 External Influences

A variety of factors influence changes in the tourism industry. At a fundamental level, tourism communities must accept the significant effects of basic factors, such as weather and wildfires. Nearby tourism venues with big events might have minor or major impacts, and these impacts could compliment or compete with park attractions, depending on how tourists plan their time.

Two important external factors affected the overall American tourism industry late in 2001: the economic recession and the terrorist attacks of September 11th. Industry experts cite increasing and decreasing influences on tourism since the attacks. People might be staying home for fear of terrorism or to save money. On the other hand, perhaps they are spending less money on vacations by driving to parks than tourists would spend if they were to travel far from home. Although foreign visitation to national parks is down, Americans are traveling domestically and identifying with national treasures.

The Severe Acute Respiratory Syndrome (SARS) coronavirus could also have created a negative effect on overall tourism, particularly for western national parks. Fears of this virus reduced travel between Asia and the United States, thereby reducing Asian travelers, who make a substantial portion of foreign visitation in many western parks.

California, as a whole, has invested in its travel industry and has established itself as the number one travel destination in the United States with $75 billion in direct spending annually. Tourism also contributes to the California economy as the state's third largest employer, but the state lost 24,000 tourism jobs between 1996 and 1998 (*203*). California saw a sharp drop in non-resident domestic travel between 2000 and 2001, but these figures improved each subsequent year to regain 2000 levels in 2003. Conversely, resident leisure trips in the state spiked from 174.8 million trips in 2000 to 195.6 million trips in 2001, but resident leisure travel declined slightly in subsequent years. Overall, leisure travel in California has remained relatively stable since 2001 (Figure G-25).

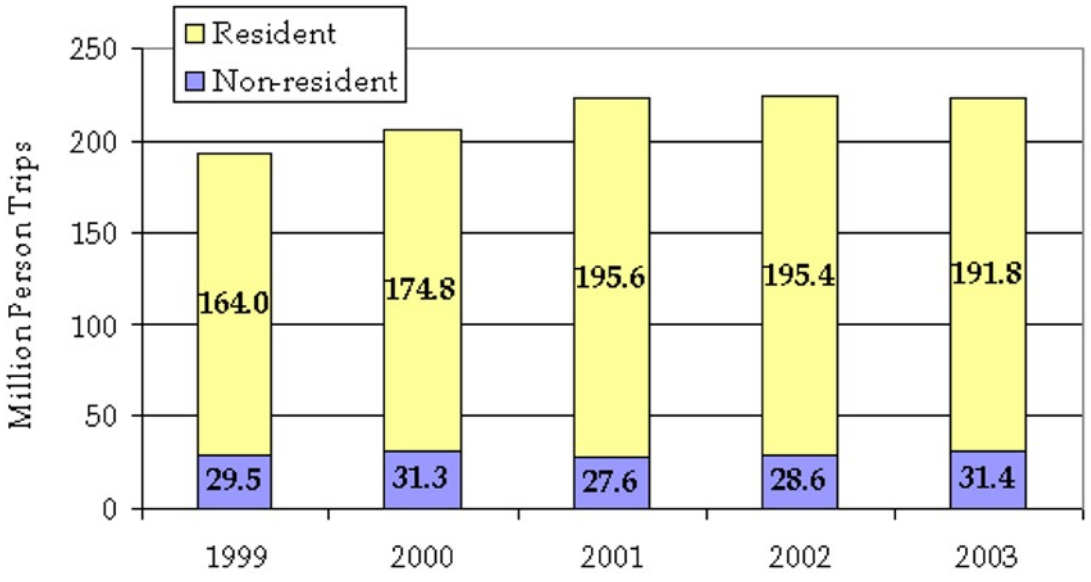


Figure G-25: Leisure travel in California has remained stable since 2001 (*204*).

G.5.2 Shuttle Impact

G.5.2.1 Employment

Yosemite's YARTS operate in conjunction with Via's own private operations, and the transit operator uses drivers between the two systems interchangeably. Because of this arrangement, YARTS did not introduce a new type of job or new skills to a fledgling workforce, but it did increase the number of jobs available for drivers and mechanics at Via and offer more options for existing employees. Via has 25 drivers total. All but four of those drivers perform for YARTS some of the time, and Via has three drivers dedicated to YARTS. Drivers work year-round for between $9 and $12 per hour from clock-in to clock-out, which includes pay for sitting in the park for five hours every day, whereas the YARTS contract with Via only pays for service hours.

Commuters form a large portion of total ridership. Why would commuting employees find transit in parks and gateway communities appealing? They see the traffic on a daily basis, so they know to expect traffic problems in central locations where they need to go. Commuting employees also have familiarity with the system and understand the predictability of schedules, whereas visitors might feel intimidated with an unfamiliar system and a limited number of days to spend in a recreational area. The YARTS system offers seasonal passes for commuters. In the first year, National Park Service and park concessioner employees received free passes on YARTS; in subsequent years, only National Park Service employees have received free passes.

G.5.2.2 Visitation Patterns

Business people in gateway communities worry about a primary question related to transit: do people stop coming to parks when transit is introduced? If the number of

visitors declines, then the number of people spending money in local businesses declines and the local economy suffers. Similarly, if transit causes an increase in visitation, an upswing in the local economy would likely occur. After the activation of the Restricted Access Plan and the subsequent loss of visitors in the region, Yosemite's gateway communities feel sensitive to this question.

A recent study of the economic opportunities of YARTS discussed potential changes in visitation and related the impacts on visitation to the convenience of the service (*205*):

> If YARTS is perceived as making access more inconvenient, it may cause some visitors to decrease their demand, at least in the near term. But, given the apparently very strong underlying and unserved demand for Yosemite visitation, and the voluntary nature of the Phased Transit System, it seems likely that, over the long term, some negative changes to the Yosemite visitation experience can be imposed without reducing overall park visitation.

This text implies that unattractive service can be imposed on visitors where some proportion of visitors is, in essence, disposable. Ideally, transit for parks will represent an attractive transportation option, rather than "imposed negative changes." Appealing transit service that people choose to ride would attract visitors, rather than require a replacement audience for people dissuaded from visiting. Such appealing service requires sufficient funding for relatively frequent service, infrastructure, and amenities.

Yosemite has experienced sharp declines in visitation since its peak years in the mid-1990s against the backdrop of stronger visitation performance in the Pacific Region (Figure G-26). The decline in visitation began before YARTS service started, and many stakeholders attributed declines in visitation to negative media messages about traffic congestion in Yosemite following the activation of the Restricted Access Plan. Yosemite

National Park bases its visitation estimates on five traffic count locations and a count of bus traffic (*206*). Given the low capacity of the YARTS bus system, the introduction of the transit service did not likely shift enough people from one mode to another substantially enough to compromise the ability of this methodology to provide comparable data

Visitor counts by entrance station can help address the question of service allocation in the surrounding counties. Data from 2002 (Figure G-27) show that consistently high numbers of visitors arrived from the south entrance and Madera County, and the east entrance gate received heavy demand late in the season when the Tioga Road was nearly guaranteed to be open. The lowest number of visitors arrived at Arch Rock on Highway 140 from Mariposa and Merced Counties, where YARTS has provided the majority of its service and where Madera and Tuolumne Counties felt resources were unfairly allocated. Service allocation needs to consider both supply and demand, and if the Arch Rock entrance received twice the funding support because it served two counties, then the county contributions and the returns that they should expect must factor into the decision of where to allocate service. As another consideration, the buses can more easily ascend the relatively gentle grades of Highway 140 than the steeper entrances from Tuolumne and Madera Counties. Visitor demand, when taken by itself, suggests that entrances other than Highway 140 from Merced need to have a strong transit presence.

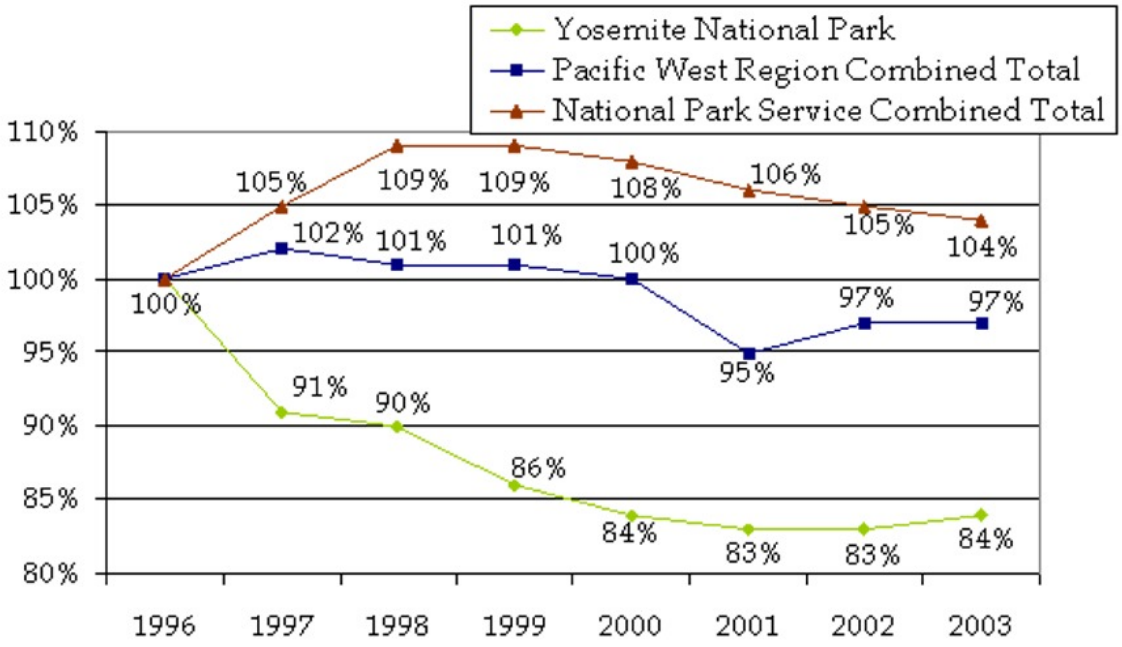


Figure G-26: Park and Regional Visitation Relative to 1996 Levels.

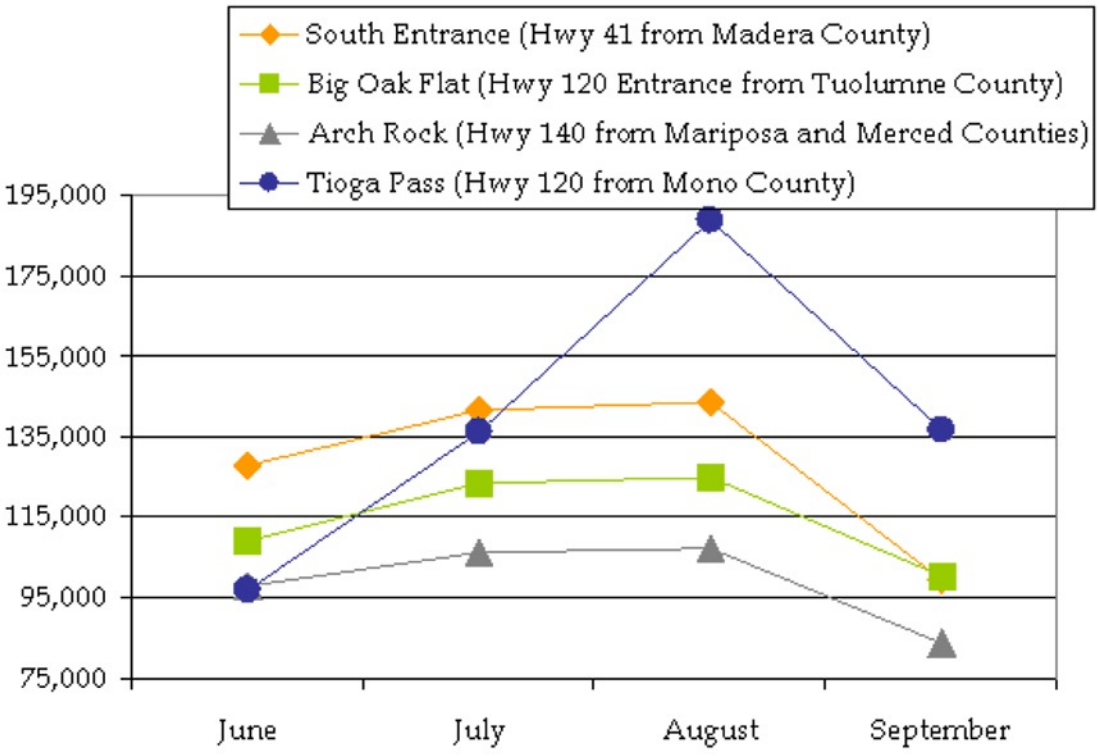


Figure G-27: Yosemite National Park Visitation by Gate in 2002.

G.5.2.3 Ridership

Ridership relative to visitation at Yosemite has remained miniscule over three years (Figure G-28). This miniscule number indicates that people take an infinitesimal number of trips to the park by bus, as compared to private vehicles. Transit has not created a substantial impact on travel patterns, so the shuttle service could not have greatly impacted local economies in terms of visitor spending behavior; however, local communities would have incurred the expense of contributing to service costs.

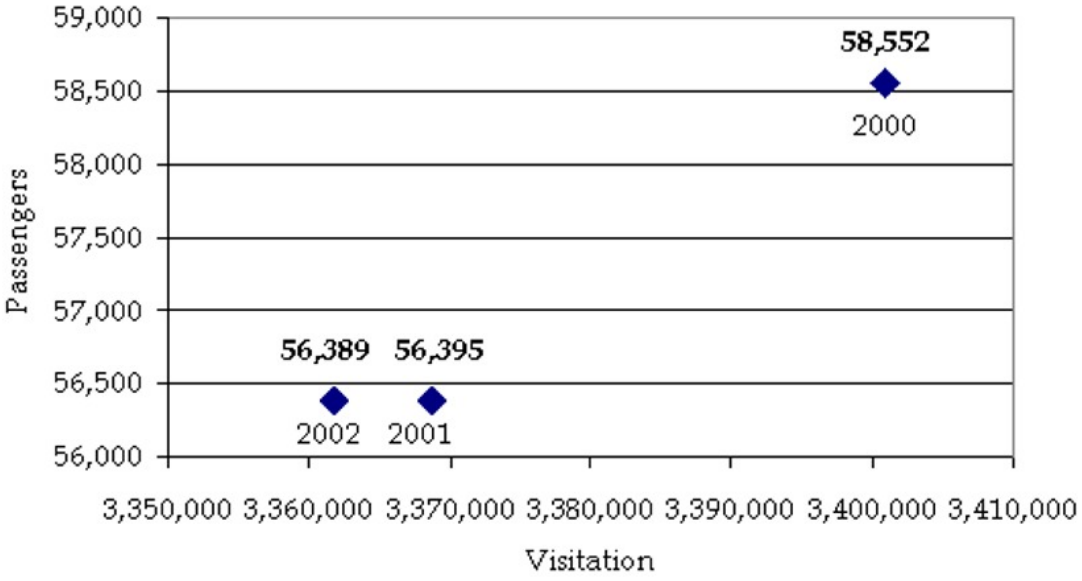


Figure G-28: Annual ridership compared to visitation.[21]

Ridership remained relatively stable between 2001 and 2002 after a 3.7-percent reduction in ridership (from 58,552 to 56,395) between 2000 and 2001. As the primary

[21] Ridership is calculated based on years from May through April, based on the start of operations and annual reporting of YARTS. Visitation is counted based on calendar years, consistent with National Park Service tabulations.

factor affecting the change in ridership between 2000 and 2001, park concessioner employees lost their free passes to ride, and commuter ridership dropped by 24 percent. Charging fares to people who have grown accustomed to riding for free or reduced costs often causes a sharp drop in ridership. From that point, a steady base of commuter ridership dropped, even as visitor ridership showed a modest increase in the peak season of 2002. Commuters provide a small, but steady, base of ridership, while visitor demand cycles through visitor seasons (Figure G-29). Foreign and backpacking visitors form a large portion of visitor ridership. YARTS advocates anticipate an increase in both commuter and visitor ridership with the opening of the University of California at Merced in the fall of 2005.

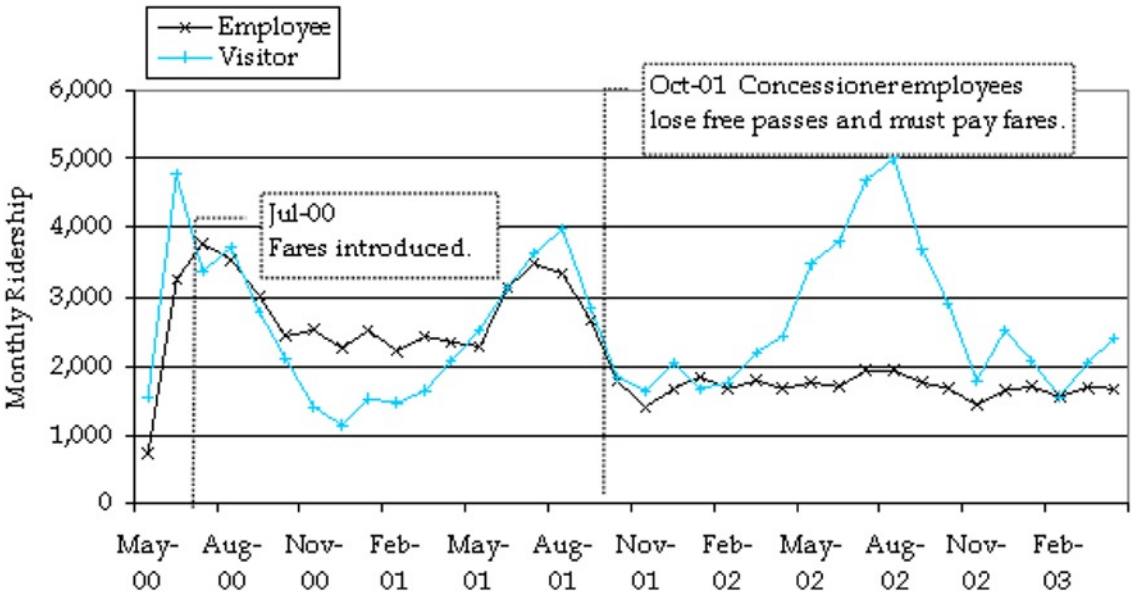


Figure G-29: For YARTS service at Yosemite, commuters comprise a substantial portion of total ridership (*207*).

Whereas the operator of Yosemite's YARTS system reports strong and loyal ridership on this small transit system, local residents perceive the buses always run empty of passengers. Several factors might contribute to this perception. The physical design of the buses does not allow easy viewing of passengers from the streets. With tinted windows and seats high off the ground, passengers might not be easy to see, particularly physically small passengers like children. Furthermore, the depot for the YARTS system is located in Merced at the furthest location from Yosemite National Park, whereas some of the bus runs start or end in Mariposa, roughly halfway between Yosemite and Merced. Drivers routinely drive empty buses... a practice called deadheading… between the start or end point of their routes and the depot. From the street, these deadheading buses look like a failure of the system to attract riders, so the general public holds the negative opinion that the bus system attracts no riders.

G.5.2.4 Parking

The subject of parking stands central to discussions of transit policy related to Yosemite National Park. Yosemite is removing parking spaces. The 1980 General Management Plan proposed eliminating half of the parking spaces available at that time, even anticipating growth in the number of visitors to the park. Visitation has risen from its 1980 level of 2,490,282 annual visitors to 3,378,664 in 2003, and peak annual visitation in 1996 exceeded 4 million visitors.

How many parking spaces does Yosemite have? The nature of attractions in national parks confounds efforts to establish a precise number of spaces. Vehicles park in formal designated parking spaces, at roadside pull-offs with no demarcation, and in less formal areas. An independent consultant said in a 1994 report that the National Park Service

estimated a total of 5,055 parking spaces in Yosemite Valley, but the consultant documented 2,247 well-defined and usable spaces (*208*). The consultant count comes closer to the estimate in the 1980 *General Management Plan*, which claimed 2,513 existing parking spaces and proposed to reduce parking by 1,242 spaces to result in a proposed parking capacity of 1,271 spaces (*186)*. The Yosemite Valley Plan, which estimated Yosemite Valley parking inventory at 1,662, takes the reductions even further by proposing to construct a new parking lot at Camp 6 to replace all day-use parking in Yosemite Valley with a single lot capable of accommodating 550 vehicles. The 1997 flood destroyed some parking areas, leading to some changes of infrastructure intended in the *Yosemite Valley Plan* (Figure G-30).



Figure G-30: Visitors are seeing parking areas disappear.

If Yosemite National Park proceeds with its parking infrastructure plan, the conditions created will necessitate private vehicle restrictions and the realization of the vision of eliminating private vehicles in Yosemite Valley. Zion National Park found that with 2,000 vehicles per day vying for 300 parking spaces, children running for picnic baskets combined with drivers searching for parking resulted in unsatisfactory safety problems. Driver frustration resulted in a compromised visitor experience, and people resorting to parking on the sides of roads led to ecological damage (*209*). Zion National Park did not have space in Zion Canyon to offer sufficient parking capacity.

Yosemite National Park is creating the same situation by reducing existing parking capacity. Yosemite has numbers comparable to Zion's situation. The 1999 *Visitor Use Study* showed that in peak season, an average of 2,084 vehicles parked in Yosemite Valley daily with peak period (1:00 to 3:00 p.m.) parking demand ranging over three days from 2,215 to 2,681 vehicles in Yosemite Valley and from 3,289 to 3,851 in the entire park (*185*). A reduction of parking capacity to 550 will exactly replicate the conditions that forced private vehicle restrictions in the Zion Canyon; however, YARTS infrastructure, operational capacity, and public support do not currently satisfy needs for providing access. With YARTS ridership in peak season below 8,000 trips monthly (one visitor could be expected to take a total of two trips daily to go into and out of the park), YARTS does not have a substantial impact on reducing the number of vehicles entering the park in search of parking.

G.5.2.5 Industry Sectors

In the most direct sense, transit offers economic opportunity to transit operators. The concessioner at Yosemite operates the Yosemite Valley Visitor Shuttle without fares

because the revenue comes through the concession contract. Via Adventures similarly runs itself as a business with the private market expectation that providing the service offers financial reward

Indirectly, local businesses should stand to reap benefits from transit because the improvements in transportation should enhance visitor experience and make the region more appealing to visitors. Local businesses say that ever since the media reported that Yosemite had closed when traffic congestion triggered implementation of the Restricted Access Plan in 1995, visitors have expressed concern that they would not have access to the park. The regional business community reflects the low visitation indicated in Figure D-22 in the form of low revenue and poor business performance.

Understanding that traffic deters visitors and that transit offers an alternative to traffic, how does YARTS affect regional business performance? Local businesses did not report any impact. Mariposa businesses see a need for regional transit and believe in the concept, as evidence by a youth hostel that actively creates its own advertising for YARTS on its premises (Figure G-31), but these beliefs have not appeared as tangible rewards. Businesses report they still lose business from the reputation of bad traffic from 1995, and even guaranteed access promised to YARTS riders has not recovered visitors.

On the east side of Yosemite National Park, Mammoth Lakes acts as a tourism destination of its own, but local entrepreneurs have connected with the YARTS system as a potential means of extending the amount of time visitors spend in the area. The trip from Mammoth Lakes to Yosemite takes four hours in one direction, but resort community marketers are selling the idea of a day trip to the park on the shuttle with a return to Mammoth Lakes for another night at a local lodge and meal in local restaurants.

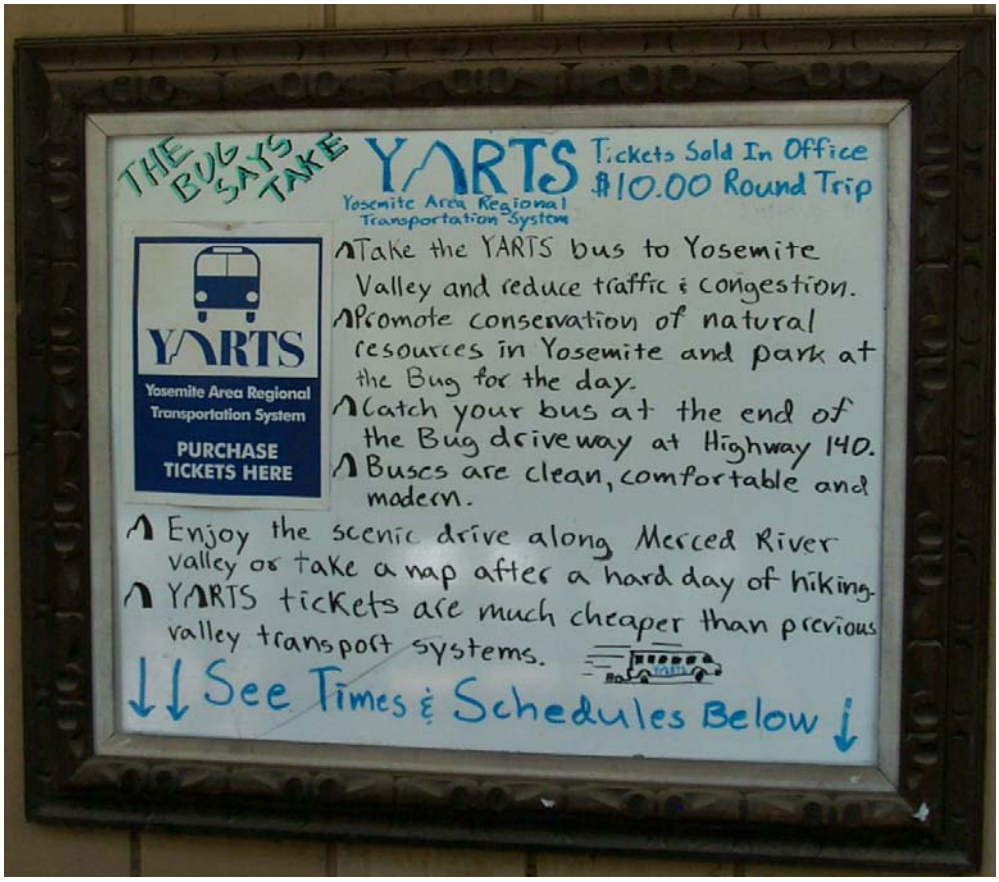


Figure G-31: A local youth hostel actively encourages guests to ride YARTS.

G.5.2.6 Long Term Costs

Financing for YARTS currently comes through grants. Yosemite National Park contributes nothing to YARTS except waived entrance fees for YARTS riders. Tuolumne County expressed concern about contributing transit money due to the procedures required to obtain transit money. The County would have to demonstrate a need for transit. With the need demonstrated, the County can contribute to YARTS, but if YARTS fails, then the demonstrated need still binds the County to spending money on transit.

The County cannot reallocate the money to roadway improvements, despite the failure of a transit initiative.

Hesitation to commit resources to YARTS manifests in manifold ways. For example:

- A small number of buses run routes on infrequent schedules.
- Transit infrastructure has consistency in neither form nor quality (Figure G-23).
- Few people ride the bus.
- Traffic and parking problems remain due to no viable alternatives to the private vehicle.

No commitment to providing financing leads to low long-term costs in the financial sense, but this lack of commitment also leads to an inability to attain the goals of transit.

6.3. Measures Taken

Unlike many other new transit systems that have started in and around national parks in recent years, YARTS faces more political challenge than financial ones. Local leaders have addressed some of the issues in the area in several ways (Table G-8).

Table G-8: Responses to Issues

Concern	Response
Yosemite National Park is not considering all factors, including stakeholder input, in its management intentions for the park.	The National Park Service brought into Yosemite a new superintendent with skills to handle delicate political situations. Community leaders outside Yosemite have commented on the newfound respect they had for the current administration.
Visitors who plan their vacations at Yosemite might not gain access to the park because of the Restricted Access Plan	The National Park Service has guaranteed access to Yosemite for riders on the YARTS shuttle, regardless of levels of demand on any given day.
Fares on YARTS deter people traveling in groups from taking the shuttle.	Yosemite charges no entrance fee to YARTS riders; future riders will potentially pay a one-dollar entrance fee in addition to their fares.
Diesel fumes from the Yosemite Valley Shuttle compromise air quality in the Valley.	The shuttle will soon switch operations to a new fleet of cleaner fuel buses. Also, the National Park Service is using alternative fuel in its fleet of vehicles for internal operations (Figure G-32).



Figure G-32: Yosemite National Park is acquiring a fleet of alternative fuel vehicles.

G.6 Recommendations for Yosemite National Park and Regional Counties

Stakeholders in the YARTS system and mobility in the region need to focus attention on two primary priorities: improving interaction among stakeholders and developing communication with the general public. A number of strategies will facilitate progress in either of these areas.

Improving relationships with regional stakeholders, particularly the five counties initially associated with YARTS, will help in numerous ways. Working in cooperation means that partners will try to assist each other. Mutual goals with mutually agreeable objectives will receive the benefit of pooled and complementary resources, such that YARTS could potentially operate at a frequency sufficient to attract people who freely choose to ride because they consider transit an attractive option. Some methods of improving regional relationships include:

- **Seriously examine the equity of service allocation.** Service allocation needs to consider both the resource supply (in terms of management and financial contribution) and visitor demand (in terms of how many visitors currently arrive at the park and by which routes. Supply and demand interact. In this case, supply refers both to county participation and to transit resource allocation. A segment of visitors can be expected to react to the geographic allocation of transportation resources by planning their visits near those resources; therefore, the allocation of YARTS capacity has implications on which counties will attract visitors and reap economic benefits.
- **Write a new general management plan.** The current *General Management Plan* dates back to 1980, and people who hold an interest and stake in the

management of the park today probably had no part in the public process that created that document. Since 1980, the National Park Service has created plans in pieces addressing specific areas of the park or specific issues, but administrators have not updated the overarching vision for the park. The vision should represent modern thought and reflect a vision that considers modern conditions in terms of demand, technology, and cultural attitudes. At the most fundamental level, the National Park Service needs to address private vehicle restrictions and the potential elimination of private vehicles in Yosemite Valley in writing, such that all of the stakeholders can have a clear understanding of the situation, the plan, and the direction of where the momentum of transportation policies and actions is leading.

- **Consider evolving the vision for elimination of private vehicles in Yosemite Valley.** The plan for pushing parking to the outskirts of Yosemite Valley can create a peaceful atmosphere in the Valley, but people consider convenient access to park attractions vitally important. Experience with private vehicle restrictions at Denali National Park and Preserve over the last thirty years and at Zion National Park in the last five years has shown that visitors respond positively to the peace of the environment, increased opportunity to view wildlife that ventures closer to quiet roads, and lack of need to battle traffic and hunt for parking. Experience at these parks has also shown that people continue to crave freedom of personal access.
    - In 2002, Denali received 18,500 entries vying for 1,600 passes to drive private vehicles into the park in the fall shoulder season; the annual lottery

receives entries from around the globe even though snow and adverse road conditions frequently bring road closures.

- Local leaders around Zion talk about the necessity and benefit of private vehicle restrictions in peak season, but the same people say how they look forward to the season's end allowing them private access to the park.
- Great Smoky Mountains National Park struck a compromise with high vehicle demand and the ideal of a peaceful experience on the 11-mile (18-kilometer) Cade's Cove Loop Road. Park administration established private vehicle restrictions for one morning each week to allow bicycle, pedestrian, and other non-motorized access to the loop road. The public enthusiastically accepted the arrangement, and non-motorized access extended to two mornings per week in peak season.

Yosemite National Park might find particular guidance with the Cade's Cove Loop Road example. The public, nonprofit groups, and elected leaders around Yosemite have expressed negative views on a complete ban of private vehicle access to the valley, but perhaps rather than strictly considering vehicle numbers, stakeholders should consider the time dimension. Restricting private vehicles one day per week outside the peak season would offer the idyllic visitor experience for people who want to experience it, while preserving private vehicle access for people who value it highly. Choosing one day per week in the spring shoulder season will offer benefit to natural resources by reducing vehicle presence at an ecologically fragile time of year, and that time of year brings a low number of

visitors, which means that the National Park Service would not need to provide service capacity and infrastructure sufficient to accommodate peak crowds.

Of paramount importance if local stakeholders choose to pursue this option, Yosemite National Park must make a written policy statement expressing the long-range intentions of this experiment. If limited use of private vehicle restrictions serves as a demonstration to lead to a total ban on private vehicles, the public needs to know it. If the use of a limited number of days dedicated to transit and non-motorized circulation will last in perpetuity, stakeholders might willingly agree to the concept when they see the policy established in writing.

- **Find mutual ground with the Friends of Yosemite Valley.** As mentioned, the Friends of Yosemite Valley has sued over the Merced River Plan, which suggests a non-collaborative relationship, even though nonprofit groups in different places have contributed to transit initiatives in national parks. The Friends of Acadia secured a one-million dollar donation for the Island Explorer shuttle serving Acadia National Park and Mount Desert Island in Maine, and the National Park Foundation has secured corporate funding from Ford Motor Company to fund transportation scholars to work in parks on term assignments to contribute their academic and professional expertise to finding solutions to park transportation problems. Yosemite itself experienced the benefit of such philanthropy when private capital first built the Tioga Road across the park. YARTS will benefit if Yosemite National Park and Friends of Yosemite Valley can come together in efforts to increase transit opportunity.

Without clear and consistent communication with the general public, visitors cannot know how YARTS can fill their needs and how to take advantage of the service. Many measures of varying complexity and expense can help communicate information about YARTS to the public:

- **Take operational measures to reduce the perception of empty buses.** If people perceive empty buses, they will assume the service does not attract riders because it is unattractive. Limiting deadheading, displaying "out-of-service" signs, or advertising bus load factors can help correct incorrect perceptions.
- **Publish and distribute maps of the YARTS route on the Internet and on paper.** When visitors have information on transportation options and see that different options will meet their needs, they can respond by choosing different options. Maps graphically depict the different locations visitors can access by bus, but for this report, the Highway 140 Route Map at the bottom of Figure C-13 came from an enhanced photograph of a map at a bus stop because this map had appeared neither on the Internet nor in print. Visitors can see from the detail of this route map how YARTS fits their needs and make their travel decisions accordingly.
- **Establish consistent fares and advertise them.** People like to know what discounts are available to them, and they do not like to learn that they paid more than they should have. The differential pricing and special offers at certain locations will hurt the reputation of YARTS as the system grows. Advertising discounts will help attract riders, and consistency in pricing and discounting will establish a stable reputation for the system.

- **Advertise the comparative cost of driving a private vehicle.** YARTS advocates defend the fare structure by saying that people do not realize the cost of driving a private vehicle into the park. On the fare sheet and fare Internet page, YARTS should post the comparative cost for taking a private vehicle from that location, the means of deriving that cost, and the non-monetized benefits of taking YARTS, such as the ability to watch scenery and avoid driving in traffic. If people have this information in front of them, they can make an informed decision about the cost of fares.
- **Introduce intelligent transportation systems (ITS).** Acadia National Park has pioneered development of intelligent transportation systems to facilitate visitor circulation. An extensive survey study has shown that 80 percent of bus riders at Acadia decide to ride the bus there partially because they see changeable message signs with real-time arrival information, and 80 percent of those riders feel the real-time information saves them time (*210*). Real-time information at Yosemite would greatly help people feel confident that the shuttle can deliver them to their destinations when they need to arrive, and it will help people make decisions to engage in other activities if they have time to wait until the next bus arrives.
- **Develop consistent infrastructure.** YARTS needs to establish its presence both in the park and in gateway communities. Infrastructure serves many different purposes. It physically comforts people with sore feet and allows the elderly (or simply the tired) a chance to rest while waiting for the bus. Modern infrastructure designs consider wheelchair accessibility under the Americans with Disabilities Act. If the infrastructure design includes a telephone, it provides emergency

communication. As an intangible but highly important benefit, infrastructure provides tasteful visibility for the shuttle system in the park and in communities. The visibility makes visitors aware of the system, instills confidence that the bus will take people where they want if they see infrastructure everywhere they go, and reminds people searching for parking that they could consider another alternative on their next trip. Although infrastructure on federal land in the park and municipal right of way in the towns must go through separate procurement processes, local communities should work with park infrastructure designers to achieve a consistent design and amenity at all YARTS stops. Visitors do not (and should not) recognize the difference in agencies influencing different stops.

From a transportation perspective, YARTS has the benefit of management through a professional bus operator. The expertise inherent in this management situation lends itself to informed transportation decisions. The partners involved in YARTS could enhance the environment for regional transportation in a few ways:

- **Place a priority on finding ways to increase the frequency of YARTS service.** Frequency has a strong correlation with convenience and the ability of transit to attract riders. People will consider YARTS more appealing if they feel that they can ride the bus without drastically altering their schedules and without fear that they will have to wait 2.5 hours if the returning bus fills before they board.
- **Reconsider the policy of removing housing for seasonal workers from the park.** From a transportation perspective, this policy does not make sense. It forces employees into a motorized commute, whereas they might walk or bicycle to work if they live near their summer jobs. Furthermore, an employee who

expects to live a long distance from work might more likely bring a private vehicle for the season. Someone living close to work and outdoor activities might prefer to avoid the expense of keeping a private vehicle. Of course, Yosemite National Park administration needs to consider this recommendation in light of the National Park Service's stated policy of moving employee housing outside of park boundaries, but this policy conflicts with the Park Service goal of easing traffic congestion in and around parks. Particularly if housing already exists within Yosemite, park administration should consider offering seasonal workers in-park housing, contingent on them bringing no private vehicle with them for the season.

G.7 Possible Implications for All Parks

To keep a collaborative process viable, partners need to think about the needs of all stakeholders and address them. Basic principles of negotiation dictate addressing stakeholder interests, rather than positions (*211*). As a simplification of an aspect of Tuolumne County's situation:

Position: Tuolumne will not participate in YARTS.

Interest: If other counties receive more service than Tuolumne does, Tuolumne's contribution to YARTS will work toward building a greater economic advantage in other counties.

As long as Tuolumne holds onto this position and other counties treat the position as the problem, the negotiation process and regional collaboration can only stalemate. If

Tuolumne can state its interest succinctly and other counties in the collaborative process will recognize this interest, rather than ignoring it or denying its importance, discussions can continue and the opportunity for creative solutions remains open.

Position: Madera will not participate in YARTS.

Interest: The basic precept of majority vote determining decisions fails to serve the needs of the minority of counties without locations on the east-west corridor. Minority interests always fall in the 3-to-2 vote structure.

The existing voting structure will never meet the needs of minority counties off of the east-west corridor. If YARTS wants to include Madera and Tuolumne as partners, the fundamental decision-structure of the organization needs to find ways to accommodate minority interests. Depending on the interests that Madera and Tuolumne can articulate and the types of creative solutions proposed, some means of addressing minority interests might not need to come at the expense of majority stakeholders.

Overall, the YARTS story shows the need to consider and address stakeholder interests in partnering processes, rather than dictate the greater good by majority or authority. The controversy surrounding the proposed elimination of private vehicles in Yosemite Valley appears to illustrate another aspect of this principle: people need to feel that their needs will be met before something is taken from them. For nearly all 3.4 million annual visitors to Yosemite, YARTS has not yet proven itself a viable and attractive alternative to private vehicle access, yet planning documents for Yosemite

National Park indicate that the National Park Service will impose public transportation on visitors. Prohibitive policies and strict enforcement do not make good substitutes for providing the resources needed to create viable alternatives. Friction and unrest grow in many different corners when people feel forced into disfavored situations.

Finally, the controversy over the elimination of private vehicles in Yosemite Valley shows how people can start reacting when they see plans taking form, not necessarily when the ideas appear on paper. The controversy appears to have started a couple of decades late. How did the strong language of the 1980 *General Management Plan* pass through the public process into adoption? Why are people reacting now? When directly asked in interviews, stakeholders indicated that they did not believe that the National Park Service would carry through with the plan because the agency did not have the resources. The flood brought resources in the form of reconstruction funds and designs, and people started reacting even though the changes had existed in public record for nearly two decades. What was the opposition during the initial public process? Perhaps other battles took precedence at the time when the strong language appeared and unrealizable threat. In any event, people involved in other public processes can see from Yosemite's situation that people react differently to plans than they do to action. Before implementing transportation plans with such far-reaching impact, parks and park partners need to strategize for a public dialog and address concerns, recognizing that people will fear change most when change starts to appear.

G.8 Summary

Traffic and auto emissions have taken a toll on visitor experience at Yosemite National Park for decades to the point that Yosemite's 1980 *General Management Plan*

called for severe reductions in private vehicles allowed in Yosemite Valley. On the valley floor, the Yosemite Valley Visitor Shuttle has operated as a fare-free means of moving visitors; in 2000, a collaboration of counties adjacent to the park brought forth the Yosemite Area Regional Transportation System (YARTS) to bus people into the park, such that people never need to bring private vehicles into the park. The system started, but the collaborative process that launched operations failed. Two of five counties dropped out of the partnership. Conversations with stakeholders indicate a strong sense of mistrust of motivations and actions. Stakeholders who do not agree with the idea of eliminating private vehicles in Yosemite Valley feel that YARTS could be intended to make that vision a reality. Counties that dropped out of the partnership felt that the other three counties were hoarding prime shuttle resources for themselves. What had started as collaboration to pool resources to achieve mutual goals has deteriorated into a situation where individual members mistrust the other members and try to advance individual goals. As a result, YARTS has resources only to offer infrequent service used mostly by subsidized park employees. YARTS has not realized the vision of visitors traveling car-free; therefore, local communities have seen little change in terms of traffic improvements and economic opportunities for local businesses. The YARTS experience underscores the need to approach collaborative processes with attention to the details of the art of negotiation. Without honest consideration of this public process, the objectives of YARTS have been realized in the sense that the service operates, but the service has not satisfied the goal of substantially reducing private vehicle traffic and providing visitors with a viable transportation alternative.

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APPENDIX H: CASE STUDY OF ZION NATIONAL PARK AND SPRINGDALE, UTAH



Figure H-1: Zion National Park.

H.1 Introduction

Zion National Park stands as an example of a park that needed transit to solve a substantial traffic congestion problem. With the introduction of transit in the most heavily traveled part of the park, the National Park Service implemented private vehicle restrictions in the park and offered bus service in the gateway community of Springdale, Utah. Zion's experience shows the effects of both private vehicle restrictions and coordination with the gateway community. This case study occurs in the context of a

"pass-through" park, meaning that people will typically visit this park as one attraction on a vacation with multiple destinations or as a stop on a longer journey. Information on Zion National Park comes from a site visit conducted October 3rd through 8th, 2002.

H.2 Background

H.2.1 Zion National Park

Zion National Park, encompassing 229 square miles (593 km^2) of canyons and cliffs at the junction of the Colorado Plateau, the Great Basin, and the Mojave Desert provinces in southern Utah, served 2.1 million visitors in 2001 and 2.6 million in 2002. This park, which features the largest sandstone mountains in the world, has internationally renowned rock climbing opportunities and a variety of easy and strenuous hiking trails. Located in the southern part of the Intermountain Region of the National Park Service, this park forms one component of the Grand Circle tour (Figure H-2), which also includes Bryce Canyon National Park (86 miles/138 km north), Lake Powell, the north rim of Grand Canyon National Park (120 miles/193 km south), Antelope Canyon in Arizona, Mesa Verde in Colorado, Monument Valley Navajo Tribal Park, Canyonlands National Park, Arches National Park, and Capital Reef National Park, and the Bureau of Land Management's Grand Staircase – Escalante National Monument.

Zion National Park released its last visitor use study in 1992. It indicated that 67 percent of the people visiting the park were in family groups, and 69 percent of visitors were coming to the park for the first time. Foreign visitors made up 21 percent of study respondents, primarily from Germany. Two thirds of the visitors spent less than one day at the park, and the final third spent between one and four days there. Visitor groups averaged $42 for each visit with a per capita expenditure averaging $14. Outside the

park, within a one hour drive, groups spent an average of $106, with a $37 expenditure per capita (*212*).

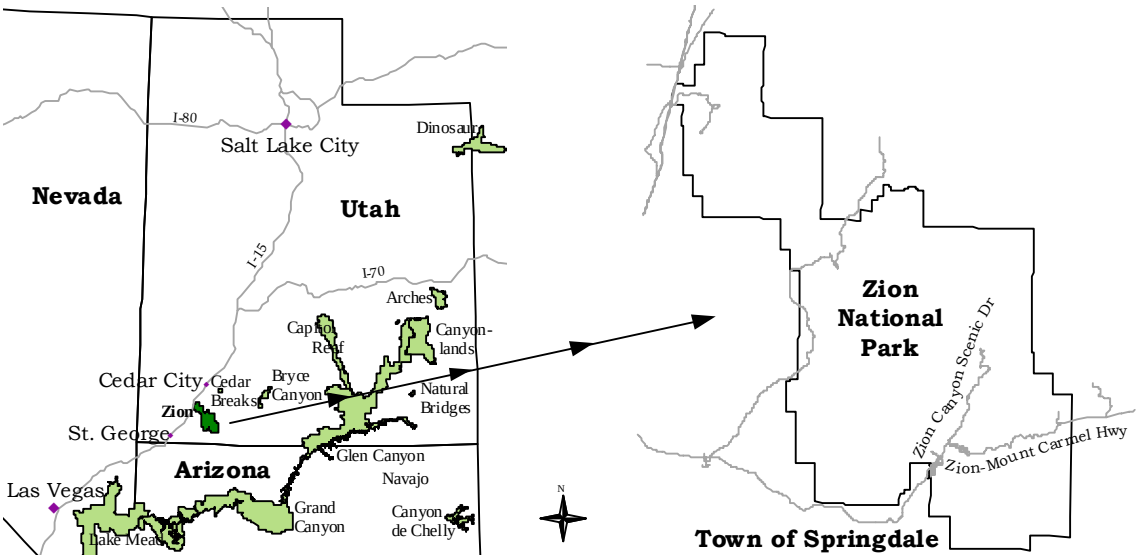


Figure H-2: Zion National Park in relation to national parks in the region.

The park draws regular visitors from several population centers in the west. With a location between Las Vegas (158 miles/254 km west on I-15) and Salt Lake City (325 miles/523 km north on I-15), the park attracts many visitors from these metropolitan areas in particular. The park also sees a number of visitors from the population centers of southern California. Visitors coming to the area are typically oriented toward windshield touring in private vehicles. Many people visiting from outside the region have traditionally landed at the Las Vegas airport, driven three hours in a rental car to Zion National Park for the afternoon, then driven north to Bryce Canyon National Park for the evening. With the introduction of shuttle service, which attempts to get visitors out of

private vehicles in Zion, some people might stay the night in Springdale after spending the afternoon on the shuttle and on the trails.

H.2.2 The Gateway Community: Springdale, Utah

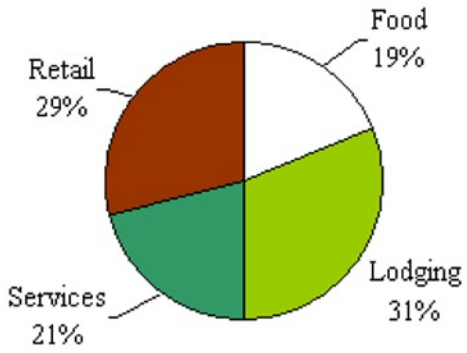
Located in Utah's Washington County on the southern border of Zion National Park, Springdale is largely a linear community with its commercial district running the length of State Route 9 through the center of town. With 391 people living on 4.6 square miles (11.9 km^2), the town has a small population and a low population density; population growth of 64 percent has occurred in the last decade. The surrounding county's population has grown at an even faster pace of 86 percent between 1990 and 2000 (Table H-1). Springdale has shown moderate turnover with 52 percent of the community living in the same house between 1995 and 2000 and 73 percent living in the same county. With a population 85 percent white, the balance of residents comes from a mix of ethnic groups with no dominant minority. Growth is expected to continue in Springdale. The town planning commission is working with plans to build 130 new hotel rooms in town.

Table H-1: Community Characteristics in Census 2000 and Change from 1990

	Springdale	Washington County	Utah	United States
Population	391 +64%	90,354 +86%	2,233,169 +30%	281,421,906 +13%
Median Household Income	$41,607 +49%	$37,212 +51%	$45,726 +55%	$41,944 +40%
Per Capita Income	$25,593 94%	$15,873 68%	$18,185 +65%	$21,587 +50%
Population below Poverty	9.0% +1.1 pt	11.2% -2.1 pt	9.4% -2.0 pt	12.4% -0.7
Land Area in Square Miles (Square Kilometers)	4.6 (11.9)	2,427.2 (6,286.4)	82,168.1 (212,815.5)	3,537,438.4 (9,159,116.1)

As a characteristic of many gateway communities, much of Springdale's employment comes from a number of small local employers. Small shops, restaurants, hotels, and service businesses serve the tourism crowds. Zoning ordinances of the town of Springdale restrict national or regional chains trying to enter the area. Based on the number of establishments in Springdale with active business licenses registered in the State of Utah, a roughly even balance exists between businesses providing lodging, shopping, dining, and services (Figure H-3). The chamber of commerce for Springdale has such an emphasis on tourism that it calls itself the Zion Canyon Visitors Bureau.

Total: 48 establishments



Data Source: State of Utah Department of Commerce
Division of Corporations and Commercial Code

Figure H-3: Springdale tourism business establishments.

Springdale's planning commission has established a tourism-oriented planning code. The town's mission statement emphasizes the need to maintain the character of the community, to develop new expressions of that character (Figure H-4), to continue the partnering strategies that have integrated the park and the community, and to assist local

businesses (Figure H-5). Springdale's current general plan, which was adopted in 1992, anticipates the possibility of the Zion transit system, but makes no specific plans for how the town will interact with it. The town is currently going through a public process to develop a general plan for 2003. The planning commission comprises seven Springdale voting members, one non-voting member from the Town of Rockville (southwest of Springdale on State Route 9), and one from Zion National Park.



Figure H-4: The design of bus stops in town matches the design themes of the park.

Our mission is to create a year-round destination community known for:

- Our friendly, safe and rural lifestyle;
- Our commitment to protecting the natural beauty around us;
- Creating opportunities for artistic, cultural and historical expression;
- Providing infrastructure, services, facilities, amenities and alternate modes of transportation to enhance the lives of our residents and the experience of our guests;
- Being pioneers in the techniques we use and partnerships we form to achieve our goals; and
- Working with local businesses to develop marketing strategies and events to reach local and world-wide visitors, ensuring our success as a society that matches our scenery.

Figure H-5: Mission statement for the Town of Springdale.

More aggressive development is happening outside Springdale in Washington County. With winter skiing in the Rocky Mountains and the plethora of national parks and monuments in southern Utah for summer vacation crowds, the State of Utah has dedicated many resources to encourage tourism. The chamber of commerce for the Washington County seat (Saint George), the county regional tourism board, and the economic development department for Washington County have all encouraged the 86 percent increase in population in the county in the last decade (Table H-1).

The county's Economic Development Council sees a need for more high tech jobs, requiring an institution of higher education, state-of-the-art telecommunications, and an airport that provides large jet service. Saint George and Washington County leaders are pushing plans for a new airport to replace the existing mesa-top airport, which has runways too short to accommodate jet traffic safely. Approximately 30 percent of the companies interacting with the Council and considering moving into the area feel that the current airport falls short of the community's air service needs, so construction of a new airport at a new location scheduled for 2008 forms a cornerstone of the regional economic development plan.

Springdale leaders do not feel they will realize the same benefits from the airport. The current airport plan includes a runway angled such that flight tracks cross directly over Zion, which raises concerns.

H.3 The Zion Canyon Shuttle

H.3.1 Current Conditions

The Zion Canyon Shuttle System opened in May 2000. It now operates seasonally from late March through late October. In the 2001 season, the system served 2.1 million

passengers, which is comparable to the total number of visitors to the park for that full year. Passengers pay no fares.

Park Transportation, Inc., the subsidiary of MacDonald Transit operating the system in Zion National Park, runs shuttle service on two loops: a park loop with nine stops in Zion Canyon (Figure H-6) and a town loop with seven fixed stops and two flag stops along Main Street in Springdale. In Zion Canyon, which is the main tourist attraction for the park, buses run every 6-10 minutes during peak hours (from 9:00 in the morning to 10:00 at night). In Springdale, buses run on 10-15 minute headways at peak periods.

When the shuttle is operating, private vehicles are largely prohibited on the canyon road. Currently, only people staying in the Zion Lodge, which is located halfway up the canyon, are permitted to drive their private vehicles to the lodge. Tour bus companies with arrangements at the lodge are also permitted to operate up to that point. The upper canyon road is open only to the Zion Canyon Shuttle System.

The system runs 30 propane buses and 21 trailers. Inside the park, a bus tows a trailer in tandem, seating up to 68 passengers. Outside the park, the buses run without the trailers. Standees are allowed on both loops, and all buses are accessible in accordance with the Americans with Disabilities Act.

Public opinion largely supports the shuttle service. The park reports that 90 percent of visitor comments on the service are positive. The two biggest complaints about the shuttle regard vehicle design. Visitors looking up at the canyon walls find views obstructed by the closed opaque roof of the vehicle (Figure H-7 and Figure H-8). Also, when the summer heat of the southern Utah desert reaches average high temperatures in July of 102 degrees, many passengers find the lack of air conditioning uncomfortable.

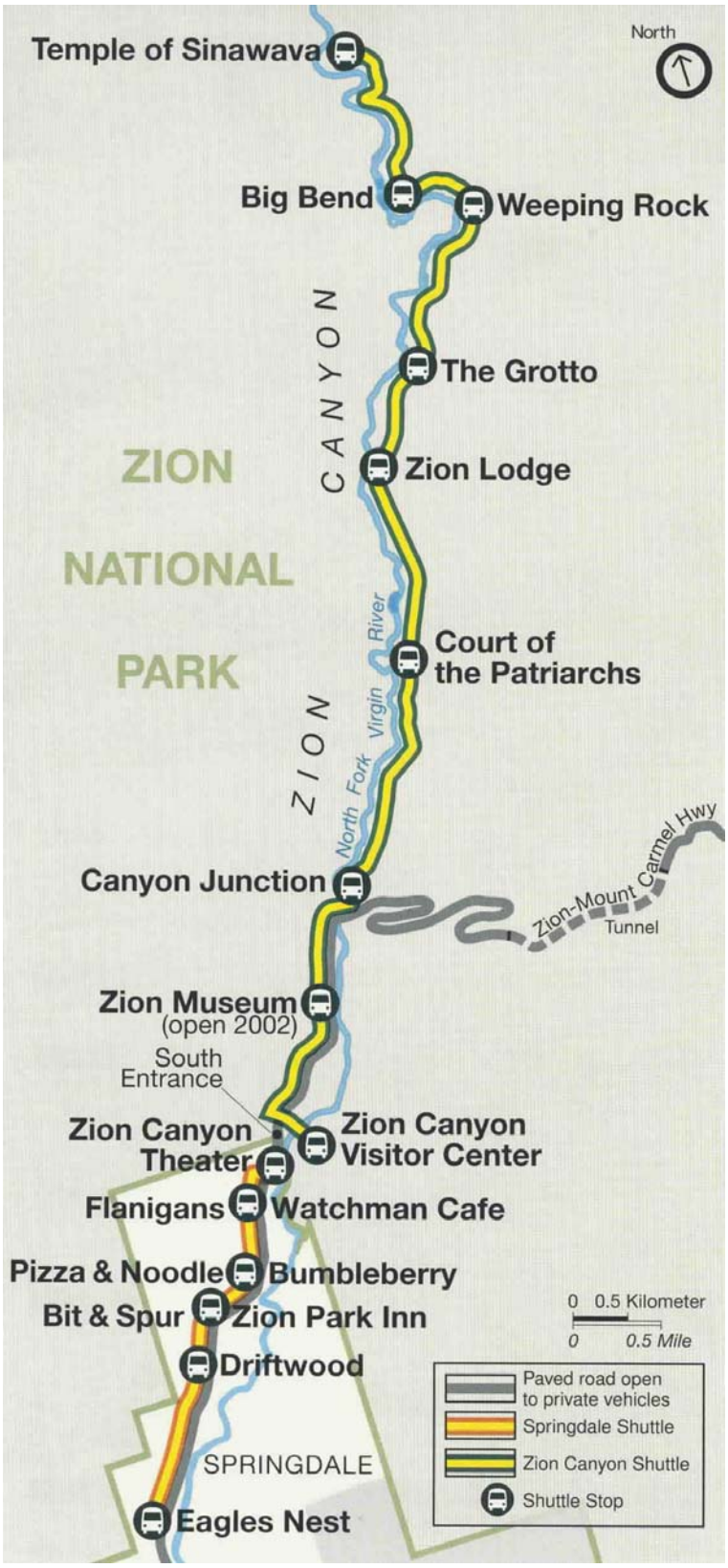


Figure H-6: Shuttle routes in town and in the park.



Figure H-7: Inside the park, the shuttle runs along the Zion Canyon Scenic Drive, where canyon walls tower in views above the bus.



Figure H-8: Shuttle bus interior.

H.3.2 History: Goals and Lessons

The Zion National Park General Management Plan targets the shuttle system to eliminate vehicle congestion and parking problems. It is also intended as means to control existing and potential land-based noise sources. Before shuttle service started, 2,000 vehicles vied for 300 parking spaces in the park on an average summer day (*213*).

Discussion of the idea for the shuttle system arose in the 1970s, and planning began in earnest in the 1990s. Stakeholders in Springdale approached the National Park Service and indicated they wanted to be involved in the planning process. The subsequent collaborative effort included participation from Zion National Park, the National Park Service Denver Service Center, the City of Springdale, the Utah Department of Transportation, and local business leaders. Based on the process, key lessons in partnering and communication emerged. The system required buy-in and participation from Park staff, communities, other governmental agencies and congressional staff. The Park found that the process could move forward best by keeping all parties informed at all times; honesty about potential negative impacts, as well as expected benefits, was necessary. Communicating with the public was equally important. Park administrators found that they needed to insure signs and public information stayed consistent and comprehensive.

Notably, transit companies and industry expertise were not brought into the process until one year prior to implementation. One primary lesson learned from this experience was that the Park should have involved these professionals earlier in the planning process, well ahead of service inception. Administrators at Zion felt it had been important to decide early in the planning process whether to use a concession or a service

contract for operations. Taking the time to find a good contractor made implementation go smoothly.

With the system in operation, several lessons in design emerged. Visitors got confused when they had to read signs to tell them the direction in which a bus is headed. Bus stops where the bus points in the direction of travel gave visitors a better orientation, which was important in a setting where 69 percent of passengers are visiting the park for the first time. As another design lesson, observers found that buses and other uses conflicted on narrow roadways. Restrictions on private vehicles have reduced such conflicts, but the transit operator must train drivers to be aware of bicyclists, pedestrians, and others.

Participants found that bringing the shuttle into operation took more time and money than expected, and future costs continue to mount. Replacement of rolling stock after buses reach the end of their service lives will require another infusion of capital. Also, the weight of the buses causes more road wear than administrators anticipated. No transit systems in America sustain themselves on fares, so parks must establish long-range funding sources for continuing subsidy.

For other parks designing transit systems, Zion National Park identified several more key lessons. Administrators recommended maximizing the consistency of services from park to park, so visitors know what to expect as they travel through the system; however, even with that guideline, system designers found that one size does not fit all. Transit systems must satisfy the needs of individual parks and gateway communities. When time comes to start the system, service introduction should not occur during peak visitation.

Zion National Park chose to start Zion Canyon Shuttle operations shortly before Memorial Day in 2000.

H.4 Impacts

H.4.1 External Influences

A variety of factors influence changes in the tourism industry in Springdale and visitation in Zion National Park. At a fundamental level, tourism communities must accept the significant effects of basic factors, such as weather and wildfires. Nearby tourism venues with big events, such as the Olympics in Salt Lake City, might have minor or major impacts, and these impacts could compliment or compete with park attractions, depending on how tourists plan their time.

Two important external factors affected the overall American tourism industry late in 2001: the economic recession and the terrorist attacks of September 11th. Industry experts disagree about whether these factors have had a positive or negative impact. People might be staying home for fear of terrorism or to save money. On the other hand, perhaps they are spending less money on vacations by driving to parks than tourists would spend if they were to travel far from home. Although foreign visitation to national parks is down, Americans are traveling domestically and identifying with national treasures. Zion reports that visitation dropped after September 11th, but after the initial shock to the nation, the park saw its busiest Thanksgiving ever in 2001.

The travel industry in Utah is experiencing some slightly inconsistent dynamics. Visits to national parks in Utah and Utah's state parks peaked in 1996, and visitation has declined fairly steadily since then. Traveler spending in Utah continued to increase for most of those years, but decreased in 2001 for the first time in at least 20 years. With

fewer visitors and higher expenditures, visitors were spending more during the booming economy. Travel-related employment continued its upward trend in the state even through 2001 (*214*).

In the region around Zion National Park, fast-paced growth can be expected to influence local tourism. As mentioned, the City of Saint George, which is the county seat of Washington County, has encouraged rapid economic development, and local leaders in Saint George see the planned new airport as a catalyst for opening southern Utah for growth in business. Substantial population growth in Las Vegas also affects visitation.

H.4.2 Shuttle Impact

Generally, local opinion favors the shuttle system. People who were originally worried about losing the convenience of private vehicle access now feel that the shuttle has brought benefits. Many locals feel they can access the park's attractions more easily with the shuttle system. Most suggestions from the public now relate to factors that are difficult to change in the short term, namely limited views out the windows, the lack of air conditioning on buses, and the difficulties finding accommodation for pets, which are not permitted on the shuttle.

H.4.2.1 Employment

To run the shuttle service, Parks Transportation, Inc. employs 60 people, including drivers, mechanics, and office personnel. Despite the seasonal nature of most of these jobs, 60 positions in a town of 377 people make a substantial impact on local employment. All but three of the current employees came from the local area. Most drivers obtained Commercial Driver's Licenses (CDL) after training with the company, so the shuttle operator is bringing new skills and credentials to the Springdale workforce.

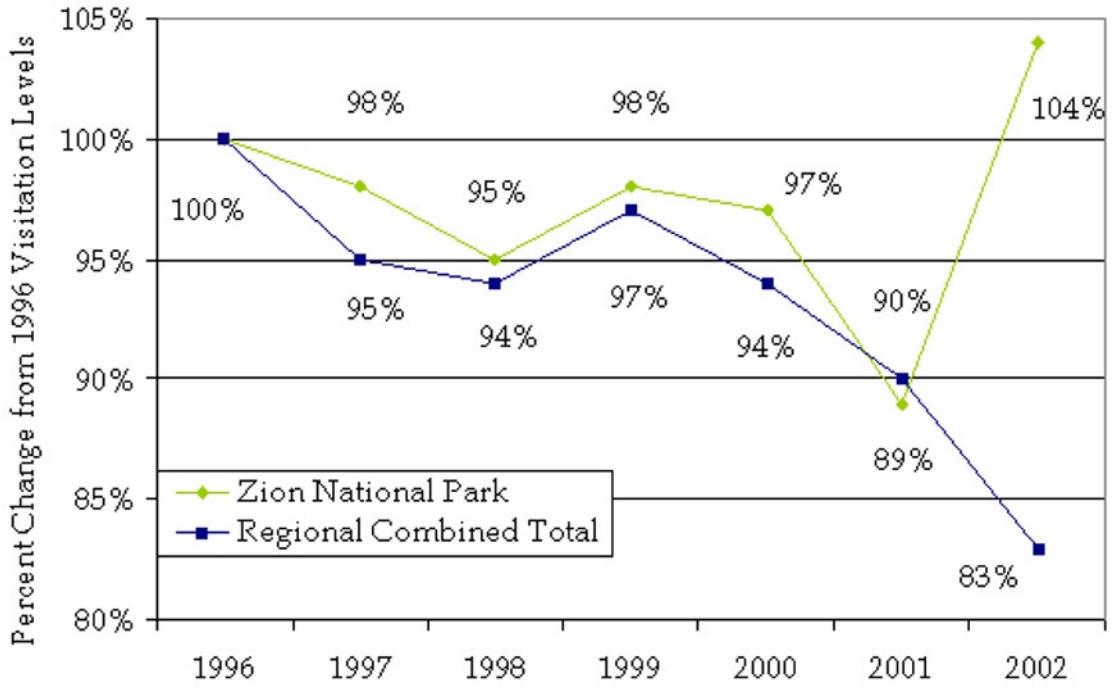
Entry-level drivers earn $14/hour, which is above the $10.55 average hourly wage for Washington County[22] (*215*). Parks Transportation, Inc. reports minimal turnover: between four and eight people per year with tight competition for positions.

H.4.2.2 Visitation Patterns

Business people in gateway communities worry about a primary question related to transit: do people stop coming to parks when transit is introduced? If the number of visitors declines, then the number of people spending money in local businesses declines and the local economy suffers. Similarly, if transit causes an increase in visitation, an upswing in the local economy would likely occur. Given that Zion visitors reported spending an average of $37 per person in 1992 at establishments in local communities during the course of their visits (*212*) and 2.6 million people visited the park in 2002, the gateway community can expect to feel strong economic impacts if transit contributes to either attracting or repelling visitors.

Visitation at parks in the region surrounding Zion has decreased in recent years while visitation in Zion has not followed a predictable pattern (Figure H-9). The new shuttle might have affected the number of people visiting Zion National Park. The local lodging association reports that the first year of shuttle service brought fewer visitors because, in its opinion, people had concerns about the new system; the association perceives that subsequent years have brought a resumption of demand. Visitation impacts lodging businesses because fewer visitors mean fewer guests.

[22] Hourly wage = ($1,830 reported monthly nonfarm wage × 12 months) ÷ (52 weeks × 40 hours/week)



The regional combined total includes changes in visitation from 1996 for Bryce Canyon National Park, Capitol Reef National Park, Cedar Breaks National Monument, Grand Canyon National Park, Lake Mead National Recreation Area, Pipe Spring National Monument, and Rainbow Bridge National Monument.

Figure H-9: Park and Regional Visitation Relative to 1996 Levels.

Speculation on transit's impact on visitation numbers is difficult to verify because the National Park Service has changed the way it counts visitors. Historically, total visitation was derived from the product of the number of vehicles passing an entrance station multiplied by persons per vehicle (*216*). With the shuttle connection at an entrance gate, walk-in visitors now make the majority of the count. Changing counting methods makes comparisons of visitation over time difficult.

Even if the count of people entering the park could have been perfect before and after the introduction of transit, comparison would be imperfect: local businesses have observed that people riding transit prefer to spend the whole day in the park, rather than exiting at lunchtime and re-entering. With this change in patterns, people who might have

been counted twice in a day in their private vehicles are only counted once entering on foot to take transit. Entrance crossings before and after transit introduction are thus different units of analysis.

Before arriving in Springdale and at Zion National Park, many people who call business or tourism agencies have concerns about the shuttle system because tourists are accustomed to driving their cars to see sights. Tourism professionals reply with the positive advantages of the shuttle service. The message and attitude conveyed in these pre-trip discussions could contribute to the decision for a tourist to come or not to come. This decision has strong implications on visitation and the local economy. As a general rule, foreign visitors find nothing unusual in the concept of the shuttle system, but American vacationers find the idea new and unsettling at first.

Environmental consequences of the shuttle system can be expected to have a long-term impact on visitation that will be difficult to isolate. Reduction in vehicle noise improves the quality of the visitor experience. As Zion National Park gains a greater reputation as a place of peace and natural sound, visitors seeking such an experience will be attracted to the park. Although future surveys might assist in identifying general trends, many visitors might not realize that the absence of a sound is what makes the place special for them. Similarly, stifling the trends of increasing vehicle emissions will protect the park from air quality problems that might have repulsed visitors in future years. How do you isolate the lack of an impact that never happened?

The shuttle has changed visitation patterns of the park. People now travel into the park in the morning and stay for the day, rather than driving into the canyon for one or two hours at a time. Because it now takes longer than ten minutes to get in and out of the

park, people prefer to make the trip only once a day. Trail use has increased, which might portend higher visitation from avid hikers in the future. The Park reports increases in backcountry use, and people who use backcountry permits stay in the area longer than other visitors do. Picnic use has decreased because carrying coolers can be cumbersome on the buses and hikers have no car trunks to store picnic supplies. While the midday has historically offered low activity for Springdale businesses, the lull has become much more exaggerated since the transit service started. Ridership peaks in the afternoon when hikers are coming off of the trails, and crowds roam the town later in the evening.

H.4.2.3 Ridership

Given the difficulties in interpreting visitation data through the changes in how visitors are counted, ridership data offer important insight into the question of whether transit affects people's decisions to visit parks. Particularly on the town loop where private vehicles are not restricted, trends in ridership give some indication of whether people find the service attractive enough to use repeatedly or whether they would prefer to avoid the system.

Almost 90 percent of total ridership has occurred on the canyon loop inside the park (Figure H-10). Private vehicles are restricted where the canyon loop runs, so people who want to see the canyon must take the bus, and the canyon loop takes visitors to the most famous attractions of the area. The design of the transit service accommodates the heavier use of the canyon loop with tandem trailers and more frequent service.

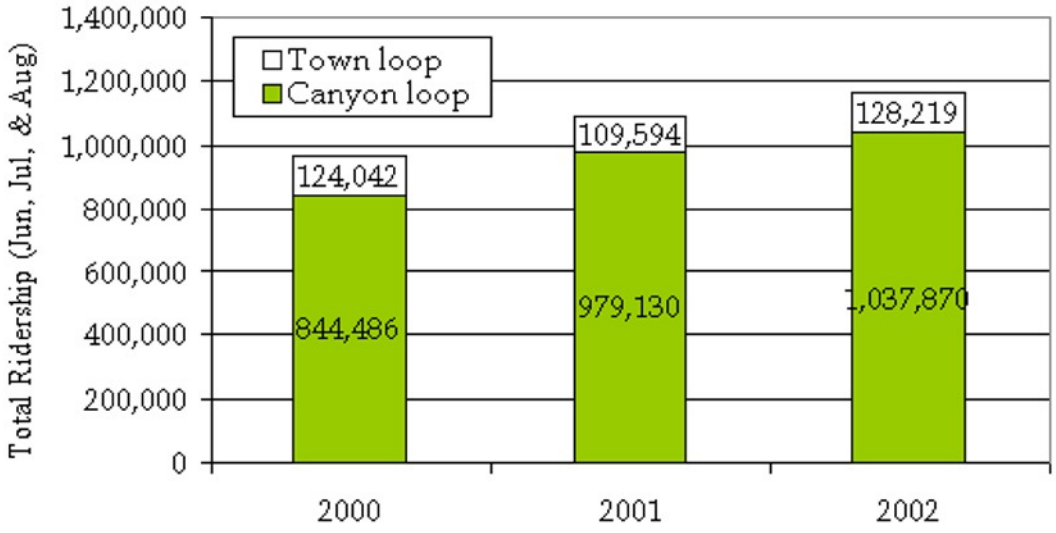


Figure H-10: Trends in peak season ridership (June, July, and August).

Figure H-10 shows that total ridership has increased each year. Increases in ridership indicate one of two things (or a combination of the two): either more people are taking transit, or the people who take transit are taking more trips by transit. Determining the extent to which either phenomenon is happening will require a survey of park visitors.

The ridership increase has occurred at the same time that visitation in the park has fluctuated (Figure H-9). This difference in trends can occur because of differences in the measurements. Ridership in Zion is calculated based on a sampling of bus boardings. This number indicates the number of bus trips taken. It has no direct relation to the number of people visiting the park. Even at times when the Park restricts private vehicle access, ridership is not equivalent to visitation. If a person gets on the bus at the entrance gate, disembarks to hike a trail in the canyon, and returns on the bus to the entrance gate, then that single visitor has made two bus trips. Visitation is one, but ridership is two.

Many visitors take more than two transit trips during their stays. Considering visitation and ridership together provides greater understanding of visitor dynamics.

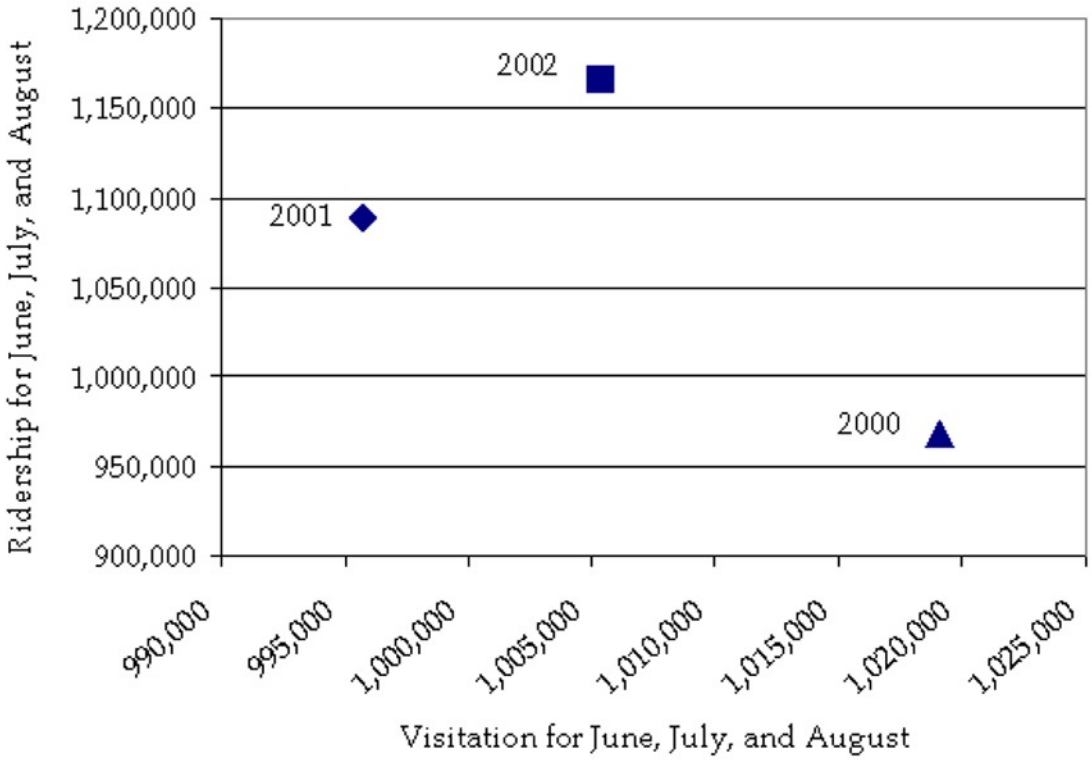


Figure H-11: Trends in the relationship between ridership and visitation.

In the first three years of service, ridership has consistently increased despite a lack of clear trends in visitation (Figure H-11). The discrepancy shows that the system is still gaining acceptance, and an equilibrium of ridership relative to the potential population of riders still has yet to appear. Even so, the data show a general range of ridership relative to visitation, and transit system organizers for the Zion Canyon Shuttle can discuss creating targets for ridership according to visitation levels experienced.

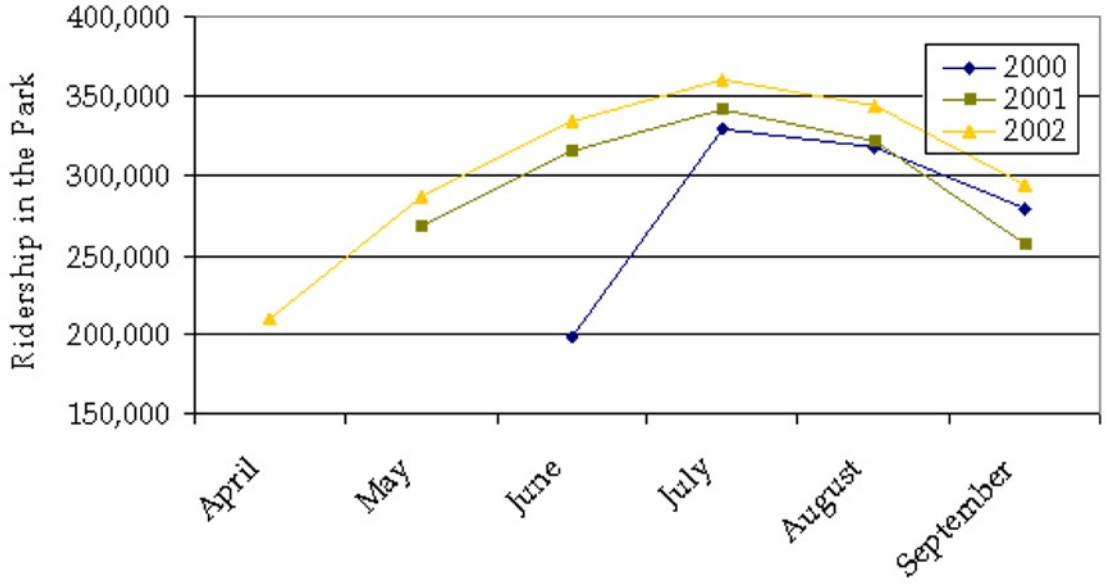


Figure H-12: Seasonal ridership on the canyon loop.

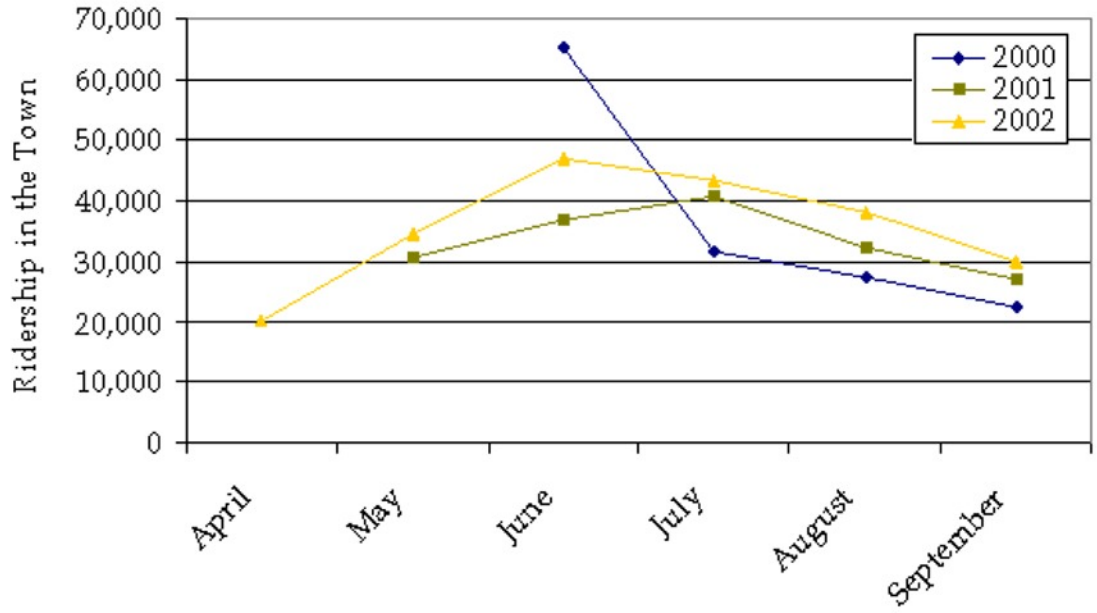


Figure H-13: Seasonal ridership on the town loop.

Seasonal ridership trends in the park (Figure H-12) and in the town (Figure H-13) have followed patterns similar to each other's, but some important differences emerged in the data. In the canyon, ridership smoothly curves to a peak in July. This pattern has appeared consistently ever since the first year, and ridership for each month has increased every year. As in the canyon, town ridership has grown consistently through the years in all months of the season. Annual trend lines in the town do not curve as smoothly as the ones in the canyon do. The jagged curve likely occurs because with the smaller ridership numbers on the town loop, minor changes in travel patterns make a relatively large impact on overall loop ridership data. Importantly, ridership in the town has not peaked consistently in July. This apparent difference in timing most likely indicates a difference in demographics. Traditionally, June brings college students to national parks, while families plan their vacations in July. In the town, where people can choose to drive private vehicles or take transit, it appears that college students are more readily willing to use transit than families are, based on data from the first years of service.

With ridership low relative to visitation in the shoulder seasons, people who visit in shoulder seasons either stop fewer times in the park or visit attractions other than the canyon. Local residents might make a higher proportion of the people visiting the park in the shoulder season, and they likely have a singular destination or activity in mind (other than sight-seeing), and they might prefer some of the less famous and more private locations of the park. In the height of the peak, tourist traffic will heavily dominate park visitation, and these people might choose to see as many park attractions as they can, thus boosting bus boardings relative to visitation. Seasonal peaking of the ratio could also indicate more interest in choosing to take transit in town during times of heavy traffic.

Ridership figures for June of 2000 cannot be interpreted literally. In that first month of service, Parks Transportation, Inc. found that demand for transit service weighed even more heavily in the canyon than service designers had predicted. To meet demand, three buses that had been allocated to the town for ridership counts were also used in the canyon for service; therefore, some of the high ridership allocated to the town loop in that month partially represents ridership in the canyon (Figure H-13) and inflates the annual town loop figures for 2000 (Figure H-10). This discrepancy also explains the unusually low canyon ridership that June (Figure H-12).

Overall, ridership data show an increase in activity every year throughout the season. Increasing ridership over time offers an argument that transit does not chase people away from parks, and increasing ridership in each of the months of the season suggests that people of all demographics are using the service. As experience with the transit system grows, people are using the system more and more, despite the decrease in visitation at regional parks evidenced in Figure H-9.

H.4.2.4 Parking

From the outset, parking has been recognized as perhaps the most critical issue to address. Parking problems in the canyon inspired the idea for the shuttle system. Pushing those vehicles out of the park's canyon required cooperative planning to keep the vehicles from inundating the town. Inside the park next to the visitor center near the entrance, Zion National Park built a parking lot with 400 spaces (Figure H-14). The community provided overflow parking just outside the park (Figure H-15). Visitors fill the lot inside the park before turning to the overflow lot. When vehicle queues at the park

entrance get long, rangers walk through the line of vehicles and suggest drivers consider using the overflow parking area.



Figure H-14: Most visitors take vehicles to the park and ride lot inside the park.



Figure H-15: The community has provided parking opportunities right outside the park, as well as throughout the town.

The most efficient parking and traffic strategy for the area is based on getting people to leave their vehicles parked at their hotels or in town. While planning for the new traffic management strategy, local leaders asked how many spaces each business could dedicate for park and ride. Many businesses donated small numbers of spaces that added up to a viable parking capacity for the town (500-700 parking spaces spread across town and at individual businesses). Other businesses could not support the system with spaces (Figure H-16). Some business owners felt the parking would take spaces away from customers of their establishments. Other business owners believe that if people park at their businesses all day, the end of the day might bring those people into the establishments. In the first year, most visitors still competed for the limited spaces in the park, but through communication and education in the community and in the park, local leaders perceive that in subsequent years, more visitors have parked in town and taken the town shuttle loop to the park. Ridership data confirm that perception (Figure H-13).



Figure H-16: Some businesses cannot support the parking needs of the shuttle.

H.4.2.5 Industry Sectors

Business representatives regard the switch to shuttle service differently, depending on business type. The introduction of the shuttle service is likely instigating a shift in the types of business opportunities in Springdale.

Restaurants and food establishments have seen changes. With the alteration in visitation patterns, restaurants have noticed a strong decline in lunch activity in town. People more likely eat in the park, and the park concessioner at Zion Lodge introduced an outdoor short-order service to accommodate the crowds. When people return to the town in the evening, they are ready for dinner. Many restaurant owners have noticed that business demand has shifted to later in the evening, so they have changed store hours and re-assigned employee shifts to accommodate evening demand. Some business people see opportunity in serving the dinner crowd rather than the lunch crowd because dinner usually brings higher revenue.

Retail stores give mixed reactions. Some shop owners say that the shuttle bus has taken all the visitors out of the town and hurt business. Other stores have shown no performance changes since the inception of the service. Retail sales peaks typically occur around restaurant sales peaks: people like to shop before or after they eat; therefore, retail stores have shifted their hours in the same way the restaurants have. Inside the park, concessioner retail sales have decreased because people are not willing to carry souvenirs on the shuttle or on the trails. Some locals have noted that, in general, tourists are no longer buying the volume of traditional local souvenirs they used to buy, so some retail strategies have changed, as well.

New opportunities have opened in service industries:

- **Pet boarding** has arisen as a primary need in the area. Pets are not allowed on shuttle buses, but many people visiting parks have pets in their private vehicles. Hotel rooms that allow pets book quickly. Other visitors are looking for pet boarding services. Springdale has no pet boarding businesses, so visitors are referred to services in nearby Rockville or in Saint George.
- The Park recognizes another potential entrepreneurship opportunity for short term **personal storage**. Storage businesses in convenient locations would allow people to buy souvenirs, stow their packs, and put picnic equipment in a safe place, so visitors would not have to carry these items on the shuttles or on the trails. Storage businesses can replace the lost convenience of a trunk on a private vehicle.
- **Delivery service** outside the park for goods bought inside the park has not been successful. Many of the purchases made come as an impulse buy, and the additional coordination necessary for the purchase adds too much complication to the sale.
- With the reduced traffic on the canyon road, interest in bicycling has grown in popularity (Figure H-17). Bicyclists no longer need to dodge high volumes of private vehicles, and shuttle bus drivers are trained to have a heightened awareness of cyclist safety. The expanded opportunity for bicycling has also expanded entrepreneurial opportunities in **bicycle rentals and service**. The National Park Service recognizes the need to provide infrastructure in the park and on buses to support cycling activities (Figure H-18).



Figure H-17: The shuttle expanded service industry opportunity, such as bike tours.



Figure H-18: Zion must support bicycle service industries with infrastructure.

- Initially, one entrepreneur anticipated a booming business of **towing and impounding** illegally parked vehicles, but demand for towing has not grown. The nearest tow truck is garaged in Saint George, 46 miles (74.1 km) away from Springdale; this arrangement appears sufficient at present.
- **Tour bus operators** could face direct competition from the shuttle service, but local leaders feel that tour companies offer a different type of product. Many of them take people from park to park, and these tours provide interpretation en route. Shuttle bus drivers give little interpretation of Zion Canyon, though the park has started offering limited bus trips in the morning with full interpretation by a park ranger. Reservations for the free ranger-interpreted tours fill quickly.
- Presumably, local transportation providers should have a new opportunity to provide **connecting service**. For instance, local taxi operators or limousine services could market transportation service from the airport in Saint George (or even Las Vegas or Salt Lake City) to Springdale for a vacation without the hassle of renting a car. Local leaders questioned the viability of such coordination; however, such opportunities will likely grow with the planned relocation and expansion of the Saint George Airport in 2008. Economic developers in Saint George hope to use the new facility to attract jet service to the area to fly more people directly to the region, rather than through major city airports.
- Some local leaders see the need and opportunity for **more activity offerings**. Entrepreneurs in the community can seize the opportunity of changing visitation patterns associated with the introduction of transit to expand the range of activities in the area. The town's mission statement calls for the development of

artistic, cultural, and historic expression (Figure H-5). If the town creates more activity offerings along these lines or in other pastimes that tourists would enjoy, local business might reach the goal of enticing visitors to stay an extra night or two in town, particularly if visitors are already getting accustomed to the idea of spending more time in the park and in the area, as a result of transit service. Zion recently prohibited tubing down the Virgin River inside the park, which greatly reduced demand for tube rentals. That new void shows that people would be engaged in recreational opportunities if they were available. Local entrepreneurs need to take the initiative to generate ideas and offer new services to expand tourist activities.

The lodging industry reports no noticeable change in business based on the shuttle. Guests generally have many questions about the shuttle system for people at hotel registration desks; at the end of the day, guests generally give positive feedback on the service. If people spend more time on trails in the park because they are not pushed through the park for lack of parking spaces, lodging business owners hope to realize an increase in the length of stay for their guests.

Overall, local leaders say that the businesses that have been willing to adapt have done well since the inception of the shuttle service. Changes have occurred in operating hours or types of goods sold. Value-added services appear to be taking a more prominent role in the local economy, and local entrepreneurs must identify, introduce, and develop these services.

H.4.2.6 Long Term Costs

Maintaining the shuttle service includes several long term costs shouldered primarily by Zion National Park, but also by the local community and the State of Utah.

- Zion National Park has contracted with Parks Transportation, Inc. on a five-year contract with a provision for five one-year extensions. Operating costs for the shuttle service run currently at $2.5 million per year for transit operations not including vehicle replacement and infrastructure maintenance costs.
- The weight of transit vehicles puts greater strain on road infrastructure. Wear from the large vehicles has accelerated the need to maintain the road. This impact will occur in the park and on Main Street in Springdale, which is a state highway.
- Maintenance of infrastructure at shuttle stops falls on the shoulders of both the Park and the Town. The Town of Springdale has established a schedule of maintenance for procedures such as resealing the benches annually.
- Zion National Park, which owns the shuttle buses, is working to find funding sources for the necessary periodic replacement of vehicles.

Notably, administrators carefully planned financing for the system, but changing circumstances altered the funding strategy. Park entrance fees formerly cost $10 per vehicle or group of visitors; Zion National Park kept 80 percent and sent 20 percent to the National Park Service in Washington, D.C. Special legislation (public law 102.03) allowed the Park to add a $10 transportation fee on top of the $10 entrance fee, and the Park could keep 100 percent of the transportation fee to pay for the shuttle. The Park would thus keep $18 for every $20 paid by visitors. Based on 1999 visitation, the park would have $2.5 million per year to pay for transit operations; however, in the same year that Zion Canyon Shuttle service started, the National Park Foundation started offering

the National Parks Pass. With this pass, visitors would pay a $50 fee to gain entrance to any national park in the system for a year. Because Zion National Park sits in close proximity to several other parks, many visitors started appearing with the National Parks Pass, and their money never fell into Zion National Park's transportation coffers. The transportation account now falls short of contract by approximately $800,000 per year, and this money must come from other funding sources in the national park system.

H.4.3 Measures Taken

Anticipating that the shuttle service would create an impact on all stakeholders in the region, several stakeholders have taken measures to mitigate potential negative impacts and to enhance potential positive impacts.

- Zion National Park offers pre-season training for employees of the park and local businesses. Orientation sessions teach people how to respond to questions about the shuttle service. Park employees are sensitized to town issues and town employees are sensitized to park issues. The chamber of commerce in Springdale sees this training as a vital component to making the integration of the shuttle service with the park and the local community successful.
- Zion National Park publicizes tourism in the park through travel agents and tourism services.
- Parks Transportation, Inc. added flag stops where local businesses have requested service. The impact of these stops has yet to be determined.
- The Zion Canyon Visitors' Bureau (the local chamber of commerce) has posted signs at stops in the town to inform visitors what businesses are located near each stop. The signs include all members of the chamber of commerce. Although

drivers on the government shuttles are not allowed to make recommendations of local businesses, Zion National Park did agree to allow the Visitors' Bureau to put brochures listing businesses and their locations on the buses; however, the Visitors' Bureau did not have funding to follow through on this project.

Local leaders feel the extent of transit's impact remains within the localized area served by the shuttle system. Although the lodging association in Saint George reported lower visitation in the first year of the shuttle service, businesses and agencies in Saint George feel that other attractions in the region mitigate economic impacts of the shuttle, whether positive or negative.

H.5 Recommendations for Springdale and Zion National Park

The Zion Canyon Shuttle System has made a large impact on the community, and local leaders have worked well together to turn those impacts into local advantages. Local businesses have needed to adapt to the system, but with the adaptation, most businesses express positive benefits from the system. At this point, several strategies aimed at promoting and building upon the existing shuttle system can enhance economic development in the town:

- **Offer orientation sessions.** Zion should offer pre- and early season orientation sessions for all seasonal employees who interact with the public, whether employed by the park, by the concessioner, or by local businesses. These information sessions should teach people serving the public how to answer questions about how to get around the park and the town.
- **Interpret the town.** Buses on the town route should have a posted listing of members of the local chamber of commerce. If visitors understand how to find

the stores and services they need, they will feel more confident that the transit system will take them where they need to go without missed stops and unnecessary backtracking. Drivers should announce general orientation information, such as the number and type of restaurants and stops at the next stop. Drivers should also announce public attractions, such as municipal parks and bicycle trails. Offering information on how to visit the town gives added value to transit service that people cannot get in private vehicles, and providing noncompetitive business information will assist the overall local economy.

- **Develop the service sector.** The chamber of commerce and local economic developers should encourage service sector entrepreneurship. People have already identified needs for pet boarding and personal storage. With the rise in interest in bicycling when safer roads availed themselves and with the decline in tubing when the park limited tubing opportunities in the area, visitors have demonstrated that they will engage themselves in activities if they are offered. Enterprising businesspeople with ideas for activities can help expand the offerings and potentially retain visitors for longer stays in the area, which helps the entire local economy.
- **Act on feedback.** The transit service has received few substantive criticisms, but transit planners and operators should listen to the ones it receives. The next generation of bus should accommodate the needs for air conditioning and high visibility. When it comes time to replace the current transit vehicles, the Park should balance the feedback of visitors and the input of transit operators to design

the safest, most operationally efficient, most environmentally friendly, and most comfortable vehicles possible.

- **Introduce intelligent transportation systems (ITS).** Intelligent transportation systems can bring technology to the shuttle system to help it work with the community. Apart from the management benefits of monitoring bus performance and understanding ridership behavior to inform better policies to accommodate demand, ITS offers information to consumers. This technology can give precise information on when the next bus will arrive at a stop. In town, the retail sector should benefit from this technology. A passenger waiting for a bus might choose to wander into a store if the next bus is due in fourteen minutes, whereas a passenger who does not know when the next bus will arrive might choose to stay close to the stop to avoid risking missing the bus. Stakeholders in Zion and Springdale should look to Acadia National Park, which is now evaluating its prototype ITS implementation on a park shuttle system.
- **Work with the airport planning commission.** The importance of creating a seamless connection to an airport should not be underestimated. Visitors need a way to get to the park without a private vehicle. When visitors pay a daily rental rate on a vehicle, they typically want to drive it. If they never rent the vehicle, the parking problem in Springdale is reduced, and visitors will not feel anxious about leaving a vehicle far from where they are engaged in activities. If the park and the local community get involved in Saint George's airport planning process early, they should be able to resolve concerns of flight tracks and encourage

entrepreneurs to provide scheduled or reserved taxi service from the airport to Springdale and the park.

H.6 Possible Implications for All Parks

The case study of Zion National Park and the Town of Springdale, Utah offers the most controlled quasi-experimental environment for economic analysis of transit in parks and gateway communities. Springdale is a town small enough that the local economy feels little impact from forces outside the tourism industry. The private vehicle restrictions in the park meant that nearly one hundred percent of the visitors to the park canyon changed the way they visit the park during the tourist season. The service offered represented the best collaborative efforts of all stakeholders involved, so the results of the service do not reflect compromises in the design of the service offered.

Other gateway communities and parks should realize that introducing shuttle service will change the needs of visitors. Service sector opportunities will open for astute entrepreneurs. Shuttle system planners should approach the communities with tools to educate business owners on ways to adapt their business strategies to take advantage of the shuttle as an asset. The local chamber of commerce should take a lead role in coordinating the business offerings of gateway communities to promote the overall economic development of these towns based on complementary business offerings and entrepreneurship opportunities. Communication and education are vital components to making shuttle systems produce benefits for visitors, parks, and businesses. Until businesses knew how to educate visitors about how to use the shuttle, visitors flocked in congested lots in the park, but now they know to park in the town among the businesses. Keeping the service comfortable, convenient, and understandable leads to satisfied

visitors, which makes jobs easier for people in local business establishments and in park public relations departments.

Experience in Zion suggests that a fully collaborative planning process works. Involvement fostered support in the town and local businesses, which, in turn, has meant that the town and local businesses support the transit system in the way they inform and interact with visitors. This positive local attitude leads to informed visitors who are potentially satisfied enough to stay in the area longer, though this hypothesis has not yet been proven.

H.7 Summary

Zion National Park instituted transit service in 2000. After a planning process that involved extensive partnering between the National Park Service, the Town of Springdale, and other stakeholders, the service was designed to run on two loops: one in the town and one in the park. Inside the park, vehicle restrictions prohibit most private vehicles from driving the Zion Canyon Road. Despite early concerns about unpredictable impacts on the town, experience after three years of shuttle service has shown that ridership has increased steadily over time and many local businesses have benefited from the service or simply felt no negative impacts. Restaurants and retail shops are finding that visitation patterns are shifting their peak business activity to later evening hours after people have spent the day in the park, so business owners are changing store hours. New types of services are emerging as visitor needs change. For instance, restrictions against pets on the buses have led to increased demand for pet boarding in the community. Visitors using transit have different needs from visitors in private automobiles, and annual ridership increases suggest that Springdale businesses will need to address this

growing market segment. Cultivating economic advantages out of changes to visitation patterns requires a methodical approach to education and communication in the community in order to help businesses devise strategies and to give seasonal employees the information they need to answer questions from visitors. Amidst all of these considerations, the evolving funding situation will require careful financial planning to support the transit system in the long term.

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