Transportation and recreation: a case study of visitors driving for pleasure at Acadia National Park

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A R T I C L E   I N F O

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- Recreation
- Indicators
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- Transportation quality
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A B S T R A C T

Automobiles and roads are as much of a way of experiencing national parks as they are a means of conveyance. This study examines experiential aspects of transportation on Acadia National Park’s primary scenic road – Ocean Drive. Interviews with vehicle-based road users were conducted to identify indicators to measure and manage experiential quality on Ocean Drive. Also, a survey was conducted to make comparisons with important variables identified on “transportation-only” urban roads. Results suggest that (1) Ocean Drive is important to park visitors’ experience; (2) experiential indicators for Ocean Drive include vehicle crowding, scenery, and travel freedom/convenience; and (3) experiential aspects of transportation on scenic roads in parks may differ substantially from urban roads. Study findings suggest a need to deliberately and thoughtfully plan and manage for quality recreational experiences on roads in national parks and related areas.

1. Introduction

The social movement to create a system of national parks in the US began before emergence of the automobile, and visitors to the first national parks arrived predominantly by train (Runte, 1997). However, as the national park movement gained momentum in the early 1900’s, automobiles began to be used by many national park visitors. This growth in automobile use in parks and elsewhere led to a substantially increased mobility of people in the US and worldwide. Today ownership and use of automobiles are an established norm of modern society (Flamm and Kaufmann, 2006), long-distance trips to parks are commonplace, and automobiles are now the primary way that most visitors experience national parks (National Park Service (NPS), 1999). Approximately 273 million visits were accommodated in the US national parks in 2006 (NPS, 2007), and the vast majority of visitors arrived in personal vehicles and traveled through parks on roads designed for cars.

Automobiles are both a form of transportation and a mechanism for experiencing national parks. Park visitors use automobiles to access attraction sites or to travel to a location to participate in an activity. However, studies have consistently suggested that large numbers of people in the US also enjoy driving for recreational purposes (Manning, 1999). Recently, “driving for pleasure” was ranked as one of the most popular recreational activities in the US (National Survey on Recreation and the Environment (NSRE), 2000–2002). Some NPS units (e.g., national parkways) were even explicitly established and designed to provide recreational driving experiences within scenic natural landscapes of the US (Havlick, 2002).

The study described in this paper examines the recreational driving experience at Acadia National Park, Maine. Objectives of the study were to (1) determine the importance of Ocean Drive to the “park experience”; (2) gather data to help identify indicators of quality for the recreational driving experience; and (3) explore differences between the concept of quality for recreational driving and “transportation-only” driving.

2. Literature review

2.1. Transportation experiences in parks

The concept of mobilities examines “movements of people, objects, capital and information across the world, as well as the more local processes of daily transportation, movement through public space and the travel of material things within everyday life” (Hannam et al., 2006). Many studies of visitors’ use of transportation in parks fits within the context of micro-scale research on mobilities by examining the spatial and temporal characteristics of visitors’ movement on public lands. However, some...
research on transportation in parks has gone beyond the critical issue of visitor mobilities to examine visitors' experience during movements throughout a park.

Transportation and the experience of visiting a national park are inextricably linked, with scenic park roads, scenic vistas, and related facilities serving as primary areas for visitation (NPS, 1999; Turnbull, 2003). In fact, establishment of Olympic, Mount Rainier, and North Cascades National Parks were greatly influenced by roads and visitors who wanted to use roads to experience these natural areas in their cars (Louter, 2006). Other NPS sites like the Blue Ridge Parkway were designed to appeal almost exclusively to scenic drivers (Jolley, 1969). Also, transportation is sometimes a form of recreation that people pursue in parks. For example, Davenport and Borrie (2005) stated in a study at Yellowstone National Park that snowmobiling provided “highly meaningful recreational experiences, grounded in appreciating the park’s unique natural features and attributes.” However, snowmobiling was not perceived by users as the experience itself. Instead, snowmobiles gave users freedom, access, and a close and intimate connection with the park that would not have been possible otherwise.

Transportation-related problems have now emerged in many NPS areas. The NPS transportation planning guidebook (1999) states that use of park roads has resulted in congestion, air and noise pollution, physical deterioration of roads, and degradation of natural and cultural resources. All of these impacts directly relate to visitors’ ability to enjoy national parks. Intensive roadway use at Yosemite, Grand Canyon, Denali, Zion, Bryce Canyon, Hot Springs, and Rocky Mountain National Parks (and several other NPS sites) has caused managers to implement public transit systems to alleviate transportation problems (Dunning, 2005; NPS, 1999; Turnbull, 2003). These transit systems are intended to decrease congestion, improve visitor safety, and reduce environmental impacts (Dunning, 2005). The 2001–2005 NPS Strategic Plan lists both transportation planning and alternative transportation systems (ATS) as strategies for protecting park resources and providing for the enjoyment of visitors (NPS, 2000).

Most studies of vehicles and roadway use in national parks have focused on environmental impacts. For example, the effects of vehicle traffic on wildlife have been studied in Denali National Park (Burson et al., 2000) and at several national seashores (Melvin et al., 1994). (For a review of ecological impacts of roads see Forman et al., 2003). Less emphasis has been placed on empirical studies of the recreational driving experience. However, some research has begun to examine experiential aspects of vehicle use in parks, for visitors using either personal vehicles or ATS (e.g., buses) to see national parks.

Two studies examined the effects of the number of private vehicles on visitor experiences. A survey of Blue Ridge Parkway motorists showed that roadway congestion degraded the visitor experiences. This study went on to determine that an average of 56 cars per mile was the maximum acceptable level of use for respondents (Park Studies Laboratory, 2002). Another study of vehicle crowding at the Schoodic Peninsula portion of Acadia National Park found that on average 40 cars per mile was considered the maximum acceptable level of use by survey respondents (Manning et al., 2002). These respondents also indicated that if use levels exceeded 70 cars per mile, it would (on average) displace them from this area. These studies suggest that experiential aspects of transportation (e.g., too many vehicles on park roadways) may substantially reduce the quality of the visitor experience.

Other studies have examined experiential aspects of visitors who use ATS or Intelligent Transportation Systems (ITS) in national parks. In one study, qualitative interviews were conducted with visitors to Yosemite National Park who used the park-sponsored ATS (i.e., shuttle bus) (White, 2007). Analysis of interview text showed that factors that may influence ATS users’ behavior or perspectives include perceived freedom of travel, access, flexibility of travel, and crowding. However, results from interviews with park visitors at several NPS sites suggested use of ATS itself may influence the visitor experience (particularly where road access is available to visitors) by reducing pleasure driving opportunities, convenience, and the ability to carry recreational equipment and related belongings (Dilworth, 2003).

Another study used a quantitative survey to examine the effects of ITS on vehicle-based visitors to Acadia National Park (Daigle and Zimmerman, 2004a, 2004b; Zimmerman et al., 2003). Respondents to this survey indicated that they were most concerned about unsafe conditions caused by vehicles parked along the road, the number of automobiles, and automobile-related impacts on air quality. Survey results also indicated that ITS at Acadia (e.g., electronic signs displaying real-time parking and ATS schedule information) has made it easier for visitors to travel around the park and to avoid parking and traffic congestion. This suggests that ITS may be useful for protecting visitor experiences by preserving natural resources (e.g., keeping vehicles from parking in unauthorized areas or keeping visitors at areas intended for use) and reducing congestion.

Some studies have examined factors influencing recreational driving, but not necessarily in park settings. For example, attributes involved in driving a travel route such as directness, safety, congestion, and distance traveled, were found to be of most concern to drivers on scenic byways (Eby and Molnar, 2002). Also, transportation options like scenic byways that provide an entertaining or pleasant experience affected tourists’ choice of travel routes. Similarly, a study of physical, aesthetic, and amenity preference of tourists on roads in the state of Minnesota suggested that roads have a unique character that is recognized by drivers (Gartner and Erkkila, 2004). Attributes of roads related to scenic or environmental qualities were highly valued by respondents in this study. A survey in the state of Connecticut, confirms the importance of natural features (which rated highest), but also indicated the importance of cultural aspects to scenic route users (Kent, 1993).

2.2. Concepts of quality

The Highway Capacity Manual (HCM) is a widely used reference for roadway planning that defines transportation quality according to six “levels of service” (LOS), labeled A through F (Transportation Research Board (TRB), 2000). The concept of quality in the field of transportation is predominantly determined by measures associated with travel efficiency. For example, LOS A is characterized by completely unimpeded traffic flows, and LOS F is described by conditions where traffic ceases to flow (i.e., gridlock). This is measured on a two-lane scenic or recreational road by determining the percent of time a vehicle spends following another vehicle. For example, LOS A is characterized by less than 40% of time spent following another vehicle, and LOS E occurs when a vehicle spends greater than 85% of time following another vehicle. LOS F occurs when traffic flows are greater than a road’s capacity and vehicle travel ceases.

The HCM and its LOS framework provide an intuitive and useful approach for addressing the concept of quality in transportation. However, is the HCM’s LOS framework appropriate for roads planned and managed for recreational driving? Is quality on recreational roads best represented by efficiency-oriented variables like percent of time spent following another vehicle?

Answers to these questions might be informed by the concept of quality as considered in contemporary park and recreation planning frameworks. These frameworks include Limits of Acceptable Change (LAC) (Stankey et al., 1985), Visitor Impact Management (VIM) (Graefe et al., 1990), and Visitor Experience and Resource
3. Description of case study area

Acadia National Park (Acadia) is located on the central coast of the state of Maine, USA. The park contains one-quarter of Maine’s publicly accessible coastline (NPS, 1992). Over two million visits to the park occur annually (NPS, 2007). A majority of visitors go to the Mount Desert Island (MDI) portion of the park, and approximately 86% of visitors use the Park Loop Road to access the park’s major attractions (Littlejohn, 1999; Manning, 1997). The Ocean Drive section of the Park Loop Road starts immediately after the park entrance station and closely follows the coastline for 2.4 km (1.5 miles). Like many high-use, landmark roads in national parks, Ocean Drive is intended to provide a recreational experience for visitors who drive it. The road was designed in the 1920’s by Frederick Law Olmsted, Jr. to provide visitors classic scenic views of the rocky, picturesque Maine coast (Eastern National, n.d.; NPS, 1992).

Both the design and experiential intent of Ocean Drive is reflected in the current management and use of the park. Acadia’s 1992 General Management Plan recognizes the aesthetic values of this road, and it recommends management of the road to protect and enhance Olmstead’s original design intent (NPS, 1992). Also, the most popular visitor activity at Acadia is driving/sightseeing, with approximately 86% of visitors participating in this form of recreation (Littlejohn, 1999). Much of this recreational use is concentrated along Ocean Drive with several of the park’s most popular visitor attraction sites – Thunder Hole (a coastline geologic feature), Sand Beach, and trailheads for the Beehive and Gorham Mountain Trails – located along it; approximately 75% of visitors to the park travel Ocean Drive and stop at Thunder Hole or Sand Beach (Littlejohn, 1999).

Ocean Drive is now managed as a one-way road. The road has two lanes, and visitors are allowed to park in the right-hand lane. Personal vehicles, recreational vehicles (RV’s), tour buses, and a park-sponsored bus system all use Ocean Drive. Parking lots along Ocean Drive and much of the right-hand lane become filled with vehicles during the peak use season (July–August) (Daigle and Zimmerman, 2004a, 2004b; Zimmerman et al., 2003). A general survey of visitors to Acadia found that crowds, traffic, and congested parking related to intense visitor use were the least enjoyable aspects of the visitor experience (Littlejohn, 1999). Moreover, approximately 30% of visitors were found to have experienced either traffic or parking problems in the park.

Acadia’s 1992 General Management Plan suggested use of ATS to reduce congestion (NPS, 1999), and in 1999 an ATS called the Island Explorer was instituted to help alleviate the experiential concerns related to traffic and parking on Ocean Drive and other areas of the park. Ridership of this bus system all use Ocean Drive. Parks sponsored bus system all use Ocean Drive. Parking lots along Ocean Drive and stop at Thunder Hole or Sand Beach (Littlejohn, 1999).

4. Methods

Interviews and surveys were used to gather data to study the experiential aspects of driving for pleasure on Ocean Drive. Data were collected during the 2005 peak use season.

4.1. Interviews

Qualitative, semi-structured interviews were conducted with Ocean Drive private vehicle users (both drivers and passengers). These interviews asked respondents a core set of questions, but the interviewee was permitted to ask additional clarifying or exploratory questions. The first vehicle user encountered nearing the exit of Ocean Drive was asked to participate in the study. At the end of the interview (or if a vehicle user refused to be interviewed) the next most proximate vehicle user was asked to participate in the study. All interviews were recorded using a microcassette player, and later transcribed.

A content analysis of transcripts was performed. This analytical method usually involves searching transcribed text for recurring words or themes that make up its primary meaning (Patton, 2002). Transcripts from interviews of Ocean Drive vehicle users were coded based on procedures described by Patton (2002) and Miles and Huberman (1994). Coding is the process of segmenting data into simpler, general categories that may be used to expand and tease out new questions and levels of interpretation (Coffey and Atkinson, 1996). All codes were developed inductively – as they emerged from the text of the transcripts – but the base questions were used as an organizing framework.

All assigned codes were mutually exclusive, so each idea or topic expressed in response to a particular question is represented by only one code. However, codes representing the same or similar ideas were created and assigned when they emerged in responses to other questions. Transcribed text was coded only once – as pertaining to the most relevant question. However, multiple codes could be assigned to a single respondent’s reply to a question. The frequencies of codes were calculated for each question. Any text coded as ‘miscellaneous’ (i.e., those providing no meaningful information related to the study questions) was excluded from this paper for purposes of clarity.

4.2. Survey

A sample of Ocean Drive private vehicle users was selected and asked to complete an on-site questionnaire as they exited the road. This survey applied methods adapted from a study that measured quality of service and customer satisfaction for urban road users (Science Applications International Corporation (SAIC) et al., 2003). Ocean Drive survey respondents were asked to (1) identify the 10 most important features from a list of 29 features found on many national park scenic roads, and (2) to rank the top five features of those identified that they consider the most important on a national park scenic road. Features provided to respondents replicated all those listed in the original study of urban road users, but it also included “scenery”, “access to important park sites and attractions”, and “opportunities to drive for pleasure” as additional features. These features were added to provide a more comprehensive list of items that might be important to park road users. Features presented to respondents are shown in Table 6.
5. Results

5.1. Qualitative interviews

A total of 39 interviews were conducted from July 24–28, 2005. Data saturation, the point at which little new information emerged, was used to help determine an appropriate number of interviews to conduct (Marshall, 1996). Respondents were intercepted at Thunder Hole, near the end of Ocean Drive. Interviews lasted approximately 20 min, and over 300 pages of transcribed text were produced from the 39 interviews.

Respondents were asked two questions to gather information on the experiential importance of Ocean Drive. First, respondents were asked why they were driving on Ocean Drive. Responses provided are represented by several codes (Table 1). The most frequently occurring code associated with this question indicates that respondents were using the road to “see or get to specific sites”. For example, Respondent 30 indicated that she was using the road solely for transportation.

Respondent 30: We wanted to come here to see Thunder Hole and Sand Beach.

Interviewer: So, is it part of the experience to drive on the road or is it just that the road’s the way you get to Sand Beach and Thunder Hole?

Respondent 30: The road’s just the way you get to Sand Beach and Thunder Hole.

In other responses associated with this code, there is some suggestion that the road is contributing to the experience of visiting the park. This was seen in the response by Respondent 29.

Respondent 29: [We’re on the road] to see Thunder Hole and to go on some of the trails.

Interviewer: Okay. Is the road just a way to get to these places or is the road part of the experience as well?

Respondent 29: This time it was just to get to the place, to the particular places. In the past, it’s been to experience, you know, the whole thing.

Other codes for this question indicate that some Ocean Drive visitors use the road for more experiential reasons such as to “see beautiful scenery”, “begin exploring the park”, “see the park with others”, or “go on a leisurely drive”. For example, Respondent 1 stated she was using Ocean Drive “Because of the beautiful scenery (and) we have some visitors from out of state and we want to show them the area.” Similarly, Respondent 36 said “We’re just driving through to stop here and there and just take a leisurely drive. We’ve been here before, but we enjoy it.”

The second question focusing on the experiential importance of Ocean Drive was “Can you describe the role that Ocean Drive plays in your overall visit to Acadia National Park? In other words, how important or unimportant is driving on Ocean Drive to your experience at Acadia National Park?” Most codes associated with this question indicate the importance of Ocean Drive (Table 2). Respondent 20 said that Ocean Drive was “very important. It’s scenery that you can’t see from other parts. I mean it’s, to me, it’s a great drive, a beautiful scenic drive.” This quote characterizes many responses described by the code “Ocean Drive is important because it allows access to and enjoyment of the scenery”. Other respondents, like Respondent 31, suggested that driving on Ocean Drive was a primary component – “an opening act” or “main act” – of their visit to Acadia.

Respondent 31: It’s a very important section of the whole thing.

Interviewer: Can you describe why?

Respondent 31: Partly because it is in such a beautiful section. That’s why I think it’s the most visited also. This is just one minor attraction in a number of attractions here. Ocean Drive leads you right up to this part of the Ocean, this part of the park. Without it, you’d be missing half the experience. That’s why everybody else is here.

Interviewer: So, literally half the experience for you is coming down this road?

Respondent 31: Absolutely. It’s a wonderful part of the experience.

Respondents were asked several questions intended to help understand the variables that add to or detract from a quality recreational driving experience on Ocean Drive. Respondents were asked to describe three things they enjoyed most about their visit on Ocean Drive (Table 3). Many responses to this question were described by predominantly experiential codes such as “seeing scenery”, “parking and pull-offs to see scenery”, “tranquil, relaxing atmosphere”, or “not too much traffic”. For example, Respondent 39 said “It’s not a lot of traffic, you know, not like it is out in Bar Harbor and it’s a good road and you can see a lot, it’s scenic.” Other codes mention the importance of conventional transportation concepts (e.g., parking, traveling/access, one-way nature of the road, directional signs), but these concepts were often expressed in a manner related to the recreational experience of visiting the park. For example, Respondent 17 reported that the one-way nature of the road allowed them to better see the scenery.

Respondent 17: I think the fact that it’s one-way is very good. That way you . . . don’t have to worry about oncoming traffic, so if you’re in the left lane, you can enjoy the scenery as a driver and you know, just keeping an eye on the right-hand, but you’re not worrying about oncoming traffic or something like that. It makes it a lot easier.

Respondents were next asked what three things they enjoyed least about their visit on Ocean Drive. Responses to this question are represented by several codes (Table 4). Respondent 11 replied by saying “The least (enjoyable)? The crowds, the lack of parking, just basically having to do with that I think is too many cars are al-

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Table 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>To see or get to specific sites</td>
<td>18</td>
</tr>
<tr>
<td>To see beautiful scenery</td>
<td>6</td>
</tr>
<tr>
<td>To begin exploring the park</td>
<td>4</td>
</tr>
<tr>
<td>To see the park with others</td>
<td>3</td>
</tr>
<tr>
<td>To go on a leisurely drive</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Important because it . . .</td>
<td></td>
</tr>
<tr>
<td>Allows access to and enjoyment of scenery/ocean</td>
<td>18</td>
</tr>
<tr>
<td>Provides access to places of interest</td>
<td>15</td>
</tr>
<tr>
<td>It’s the “opening act” or “main act” for the park</td>
<td>8</td>
</tr>
<tr>
<td>Not much different from other parts of the Park Loop Road</td>
<td>2</td>
</tr>
</tbody>
</table>
Table 3
Codes assigned for responses to the question of “What are the three things you enjoyed most about your visit on Ocean Drive?”

<table>
<thead>
<tr>
<th>Code</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeing scenery</td>
<td>27</td>
</tr>
<tr>
<td>One-way nature of road</td>
<td>14</td>
</tr>
<tr>
<td>Accessing/seeing particular locations</td>
<td>13</td>
</tr>
<tr>
<td>Parking and pull-offs to see scenery</td>
<td>8</td>
</tr>
<tr>
<td>A tranquil, relaxing atmosphere</td>
<td>5</td>
</tr>
<tr>
<td>Not too much traffic</td>
<td>4</td>
</tr>
<tr>
<td>Cleanliness and maintenance of the road</td>
<td>2</td>
</tr>
<tr>
<td>Easy of wayfinding because of signs</td>
<td>2</td>
</tr>
<tr>
<td>Safety of the road</td>
<td>1</td>
</tr>
<tr>
<td>Sharing it with family and friends</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 4
Codes assigned for responses to the question of “What are the three things you enjoyed least about your visit on Ocean Drive?”

<table>
<thead>
<tr>
<th>Code</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic and crowds</td>
<td>13</td>
</tr>
<tr>
<td>Lack of parking</td>
<td>5</td>
</tr>
<tr>
<td>Parking in the right lane</td>
<td>2</td>
</tr>
<tr>
<td>Dangerous driving conditions (e.g., pedestrians, bicyclists, narrow)</td>
<td>2</td>
</tr>
<tr>
<td>Fees or fee structure</td>
<td>2</td>
</tr>
<tr>
<td>Vistas obscured by vegetation</td>
<td>1</td>
</tr>
<tr>
<td>The one-way road</td>
<td>1</td>
</tr>
<tr>
<td>Tour buses</td>
<td>1</td>
</tr>
<tr>
<td>Others speeding</td>
<td>1</td>
</tr>
<tr>
<td>Lack of signs</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 5
Codes assigned for responses to the question of “What things make for a good day while driving on Ocean Drive?”

<table>
<thead>
<tr>
<th>Code</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good weather</td>
<td>23</td>
</tr>
<tr>
<td>Little traffic or crowds</td>
<td>15</td>
</tr>
<tr>
<td>Beautiful scenery</td>
<td>4</td>
</tr>
<tr>
<td>Friendly and courteous people</td>
<td>2</td>
</tr>
<tr>
<td>A well maintained road</td>
<td>2</td>
</tr>
<tr>
<td>Easy access or places to park</td>
<td>2</td>
</tr>
<tr>
<td>People obeying regulations</td>
<td>1</td>
</tr>
</tbody>
</table>

5.2. Survey findings

A total of 262 Ocean Drive users were approached and asked to complete a questionnaire. Of those approached, 128 agreed to participate. This represents a survey response rate of 48.9%.

The survey produced results showing the percentage of respondents who rated a list of road features as being important on a national park scenic road (Table 6). More than two-thirds of respondents reported that scenery (81%), access to park sites/attractions (72%), and traffic volume (67%) were important on national park scenic roads. Additionally, a majority of Ocean Drive respondents reported that pavement quality (59%), visibility of signs/signals (58%), speed limit (56%), traffic flow (52%), and opportunities to drive for pleasure (52%) were important on national park scenic roads. Conversely, less than 10% of respondents selected signalized intersections/signals (8%), merging traffic (7%), unsignalized cross-streets/driveways (5%), and traffic signal timing (5%) as being important on national park scenic roads.

These results differed to some extent from those of a similar survey of service quality on urban roads (Table 6; SAIC, 2003). More than two-thirds of respondents to the survey of service quality on urban roads reported that pavement quality (59%), visibility of signs/signals (58%), speed limit (56%), traffic flow (52%), and opportunities to drive for pleasure (52%) were important. Conversely, less than 10% of respondents selected signalized intersections/signals (8%), merging traffic (7%), unsignalized cross-streets/driveways (5%), and traffic signal timing (5%) as being important.

Results from this survey suggest the most important features on each type of road (Table 7). The five most important features (on average and in rank order) for a national park scenic road were scenery, access to park sites/attractions, opportunities to drive for pleasure, visibility of signs/signals, and speed limit. In comparison, the most important features on urban roads were visibility of signs/signals, timing of traffic signals, ability to maneuver, left-turn only lanes, rate of traffic flow, and traffic volume. (The latter three items were tied in their overall average ranking.)

6. Discussion

6.1. Importance of ocean drive to the visitor experience

Results from this study support the idea that Ocean Drive provides both a form of transportation and a means of experiencing Acadia. Some interview response codes (such as the code indicating that visitors are driving the road to “get to or see specific sites”)
suggest an interest by some visitors in the road for more traditional transportation purposes. However, even within the text associated with these more transportation-focused codes, some references connote experiential aspects of the road. For other visitors, the road seems more useful as a means for experiencing the park. Codes (and associated text) related to seeing scenery, exploring the park, leisurely driving, and experiencing the park with others indicate that the primary intended purpose of the road for some visitors is experiential, not transportation. However, it may be that transportation aspects of the road are assumed by visitors who focused their responses on experiential uses of the road.

Also, Ocean Drive seems to play a distinct role in the overall experience at Acadia for many visitors. Most interview response codes indicate that it is a principal part of the experience at Acadia because it provides either access to enjoyment of scenery, access to places of interest, or an “opening/main act” for a visit to the park. Again, these codes (and associated text) suggest a dual role for Ocean Drive in the visitor experience. It provides access through transportation, but it also allows people to see a scenic portion of the park with some of the park’s primary attractions. However, a code indicating that Ocean Drive was “not much different from other parts of the Park Loop Road” was assigned twice. This code suggests that to some visitors, Ocean Drive is not of distinct importance to their experience of visiting Acadia.

6.2. Indicators of the recreational driving experience

Interview results suggest several potential indicators of driving for pleasure on Ocean Drive. First, vehicle use levels and related perceptions of vehicle congestion/crowding may be a primary indicator. Crowding/congestion was the most frequent code to emerge from a question asking visitors what they enjoyed least about Ocean Drive. It also emerged in codes for questions about what visitors enjoyed most (e.g., “not too much traffic”) and what constitutes an ideal experience. Furthermore, other codes in these questions may be closely related to use levels on the road. For example, the tranquil, relaxing atmosphere cited by respondents as being enjoyable is likely at least partially related to the number of vehicles that use the road at any one time. Also, variables such as parking availability, safety of driving along the road, and the cleanliness/maintenance condition of Ocean Drive may be closely related to vehicle use levels on the road.

A second potential indicator is scenic value; “seeing scenery” was the most frequent code for what people enjoyed along Ocean Drive. But, how can scenic value be measured and managed? Other codes emerging from the interviews provide possible answers to this question. Respondents suggested that maintenance of roadway vistas and litter may be important variables in the park experience along Ocean Drive. These variables might be used as proxies to measure and manage scenic value along the road. For example, litter detracts from Ocean Drive’s scenic value. Litter amounts could be monitored along the road and managed to ensure that levels do not reach a point where they are considered unacceptable by park visitors (Budruk and Manning, 2006). Moreover, key viewing points along the road could be kept clear of vegetation or other visual obstructions.

Third, codes assigned to interview responses related to parking availability, speed of travel, the one-way nature of the road, wayfinding/signage, and driving conditions suggest that freedom, convenience, and safety of travel represent other possible indicators. These codes also provide potential ways in which freedom, convenience, and safety of travel might be measured and managed. For example, the percent of time that parking lots are at their capacity or opportunities for drivers to slow down or stop along the road might be measured directly or through a survey of visitors. Simi-
larly, safety of travel might be measured through a count of safety incidents (e.g., speeding violations, accidents) or by measuring perceptions of safety among visitors.

6.3. Comparing recreational and “transportation-only” driving

Survey results allow some general comparison of important variables for driving for pleasure and “transportation-only” driving. This showed several similarities in the top ten most important features on national park scenic roads and urban roads. Survey responses indicate that traffic volume, pavement quality, visibility of signs/traffic signals, and rate of traffic flow are variables that are important to a majority of users of both national park scenic roads and urban roads. Likewise, frequency of unsignalized cross-streets/driveway entrances and two-way center left-turn lanes were variables that were important to less than 20% of users of both road types.

Some differences were seen in variables selected as one of the ten most important features on both types of roads. Roadway features that had the largest absolute difference in percent of respondents who selected that feature are left-turn only lanes at intersections, speed limit, timing of traffic signals, signalized intersections, right-turn only lanes at intersections, and overall travel time to destinations. For example, speed limit was rated as being important by most national park scenic road survey respondents, but in the study of urban road users (SAIC, 2003) it was rated as important on urban roads by only a small percentage of respondents. Speed limits lower travel speeds on national park scenic roads to permit safe sightseeing, but they may not be perceived to provide a direct, positive benefit to users of urban roads. Other differences in important road features found in this study seem to suggest that some facilities or features found to a greater extent on urban roads (i.e., signalized intersections, traffic signals, road routing to reduce travel time) are not viewed as important on national park scenic roads. (National parks scenic roads are often characterized by an emphasis on aesthetic roadway properties (e.g., providing vistas and road routing based on scenery) and a minimization of properties (e.g., signage and signals) that might detract from the naturalness or scenic aspects of a driving experience.) However, the infrequency of these facilities or features on experiential roads might contribute to this finding.

Rankings for the five most important features on national park scenic roads suggest that users of this road type value experiential aspects of the road as much, or more than the transportation aspects. For example, respondents rated scenery as the most important feature. The next two most important features – access to park sites/attractions and opportunities to drive for pleasure – also imply an experiential role for this road type. However, transportation aspects of the road, such as being able to find and get to specific sites, are also evident in the ranking of the top five most important features on national park scenic roads. The only feature that is common in the rankings of the top five most important features between national park scenic roads and urban roads is the visibility of signs/traffic signals (Table 7).

Unfortunately, a statistical comparison of important variables on national park scenic roads and urban roads cannot be made from the survey results. A limitation of the survey was the inclusion of scenery, access to important park sites and attractions, and opportunities to drive for pleasure as potential features. This was done to allow for a more complete (and arguably more accurate) examination of the most important roadway features on a national park scenic road. These features were not listed as options for selection in the comparison study of urban roads (SAIC, 2003). Because of this limitation, a direct comparison of the percentage of respondents choosing each feature is inappropriate. However, results in this study may be used with reasonable ability (as done above) to explore differences between national park scenic roads and urban roads by examining features appearing on both surveys. The above interpretation of survey results can be largely corroborated by triangulation with results from the qualitative portion of this study and with those from other studies. For example, vehicle crowding/congestion, signage, and the freedom and convenience of travel emerged as influential variables in results from both qualitative interviews and the quantitative survey. Also, findings from two previous studies at Acadia correspond to those presented here (e.g., convenience was a key experience attribute that contributed to positive evaluations of the Island Explorer, and scenic views were the most important park feature for visitors) (Daigle and Lee, 2000; Littlejohn, 1999).

As is used here, triangulation is a process that can be used to judge and enhance the reliability of research findings by seeking a convergence of results using multiple methods, investigators, data sources, or theoretical lenses (Denzin, 1970; Green et al., 1989; Tashakkori and Teddlie, 1998).

6.4. Quality in driving for pleasure

The importance of traditional transportation concepts of vehicle flows and safety seemingly hold true for national park scenic roads. Potential indicators found in the qualitative component of this study such as speed of travel, parking, and wayfinding support this premise. Furthermore, comparison of the most important features on these roads and “transportation-only” urban roads indicates the importance of more traditional transportation concepts. For example, speed of travel, pavement quality, and visibility of traffic signs/signal were all rated as important by a majority of Ocean Drive users.

Potential indicators suggested by study findings may serve as a basis for beginning to more directly examine the concept of quality of transportation in a more experiential context. Traditional transportation concepts are common indicators of quality to both experiential and “transportation-only” roads, but they may be manifested in very different ways. For example, traffic volumes (and associated perceptions of crowding/congestion) and traffic flows appear to influence the quality of both experiential and “transportation-only” roads. In the latter context, few examples exist for when high traffic volumes or low rates of traffic flow enhance quality. However, national park visitors driving for pleasure may want to frequently slow down or stop on experiential roads. Visitors may be slowing down or stopping to better see scenery, to observe wildlife, or to enjoy a more leisurely driving experience. However, based on the results from this study, some use levels or use characteristics may eventually detract from the visitor experience. This indicates that traditional transportation indicators of quality need to be reregistered when applied in the context of a national park scenic road or management of those driving for pleasure on these roads. For example, acceptable use levels for crowding/congestion on experiential roads might be either lower or higher than on urban roads. Additional research is needed to quantify such differences in how indicators are manifested in the driving experience on national parks scenic roads.

Results of this study suggest that additional variables may need to be considered when planning and managing transportation quality on scenic or experiential roads. For example, opportunities to see and experience scenery – perhaps promoted by providing stopping areas, maintaining roadway vistas, or through road designs focused on driving pleasure – should be considered in addition to traditional transportation variables. Also, speed limits were rated as important by a majority of respondents on experiential roads. This was not true for users of “transportation-only” urban roads. Speed limits on experiential roads may be more important to their users because they permit visitors to slow down or safely stop to see the scenic beauty of a park.
Based on results from this study, other variables may need to be de-emphasized in planning and management for a quality experience on experiential roads as compared with “transportation-only” roads. These variables include turn lanes at intersections, traffic signal timing, and overall travel time to destinations. Little support was found for the importance of these variables in either the qualitative interviews or survey responses. Another factor that may need to be de-emphasized or reexamined is the variable of percent time spent following another vehicle, which is stated in the HCM as a primary measure of quality on recreational or experiential roads (TRB, 2000). This variable is one of several potential ways that an indicator of quality related to vehicle congestion/crowding could be manifested on these roads. This manifestation did not emerge in data resulting from this study. However, the management of Ocean Drive (as a two-lane, one-way road where parking is allowed on the road) is not considered in the HCM, which makes a direct examination of this variable difficult. In the study of Ocean Drive, the number of vehicles within sight appeared to be important to respondents’ experiences. This seems to be a more intuitive expression of an indicator for vehicle congestion/congestion given the scenic importance of Ocean Drive. Other findings, such as the lack of importance of travel times to a destination and the desire for a leisurely driving experience, support the idea that being delayed behind another vehicle is not of high importance to users of national park scenic roads. However, further research to more specifically examine the importance of this potential indicator to users of experiential roads may be warranted.

7. Conclusions

The study described in this paper explored interrelationships between concepts of transportation and recreation in a national park. Ocean Drive, like many other similar park roads, is a principal aspect of many visitors’ overall “park experience”. Most visitors to Acadia travel on this road. But, Ocean Drive was also designed to provide an experience, and based on the findings from this study, it fulfills its intended purpose. At Acadia, transportation and recreation are inseparable companions in the visitor experience. This is most likely the case in many national parks and at other recreation sites.

The presence of scenic and experiential roads in national parks (and other related areas) suggests a need to fully understand the experience of visitors who drive for pleasure on these roads. Moreover, comprehensive management of transportation in parks should deliberately and thoughtfully incorporate concerns with the quality of this experience. Indicators of quality may serve as a conceptual basis for such management. On Ocean Drive, the quality of the visitor experience can be managed using indicators related to vehicle congestion/congestion; scenic value; and freedom, convenience, and safety of travel. Moreover, this study suggests ways that these broadly stated indicators can be specifically measured and managed. This same indicators-based approach may be useful in expanding the examination and management of pleasure driving on roads in other national parks or related areas.

Finally, results from this study of visitors driving for pleasure on Ocean Drive found that commonalities do exist between the aspects important to users of both “transportation-only” roads (e.g., urban roads) and scenic/experiential roads. As might be expected, factors such as signage, pavement quality and traffic volume are important to users of both road types. However, traditional transportation planning might not fully or adequately consider the range of variables that influence the quality of the visitor experience on many national park roads. For example, results from this study suggest that scenic value of a road and low speed limits that would permit enjoyment of scenery should be highly weighted variables in planning and management of park roads. These variables are not considered – or run counter to – some traditional transportation planning concepts that try to move people quickly through a transportation system. Also, some traditional transportation variables such as vehicle crowding/congestion might be manifested on these roads in different ways. On Ocean Drive, the number of vehicles within sight might be more salient to visitors than the traditional measures for traffic volume used in the HCM. When considered as a whole, findings from this study point toward the need for transportation planning and management in parks to not only encourage the safe, efficient travel of visitors, but to consider the recreational experience of visitors while on park roads.

References


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