

THE RELATIONSHIP BETWEEN CONDITIONS AND ATTITUDES: AN EXAMINATION OF INTELLIGENT TRANSPORTATION SYSTEMS

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Introduction

Congestion and crowding in parks have been studied a great deal over the last thirty years, although the focus has been largely on the backcountry or primitive use areas rather than the frontcountry or developed areas of the parks (Ditton, Fedler & Graefe, 1983; Patterson & Hammitt, 1990; Lewis, Lime & Anderson, 1996). The continued demand for national park experiences draws attention to the need to study these issues in the more developed areas of parks. A recent tool for managing congestion and crowding is Intelligent Transportation Systems. This approach uses information technology to improve transportation services for the public (USDOT, 1998). It “involves the application of electronic computer, navigation, information, and communication technologies to improve transportation system management and operations” (Plosky, Maloney, & Ritter, 2001, p. 3). More specifically, ITS has been used to address access and congestion concerns such as bottlenecks and safety. As noted by Roggenbuck (1992), visitors with better information may have more realistic expectations and, therefore, may be better able to reduce or avoid negative evaluations of their experience. The visitor experience includes the journey to and through the parks.

An information-based approach to management, ITS tools include electronic message signs (EMS), highway advisory radio, and use of the Internet to provide up-to-date information for visitors. While the Internet and highway advisory radio are used by many of the national parks to distribute information, the key to success for such tools is whether they will be used by visitors, and to what extent. This is dependent upon visitors deriving benefits from the system, such as reduced congestion. An ITS study conducted in Branson, Missouri and along Interstate 40 in Arizona (the later geared toward visitors headed to Grand Canyon National Park) found that ITS was effective in several areas, including improving mobility, increasing access and reducing congestion (Orban et al., 2000).

At a workshop in June 2002, transportation and national park experts agreed that the four most important issues with possible ITS solutions are to: 1) provide driver information about roadway conditions to alleviate congestion, 2) provide information that allows visitors to make informed decisions about transit, 3) provide accurate, real-time information such as traffic, weather, and park conditions (e.g. openings and closings), and 4) use information systems to direct visitors to less congested areas (Volpe National Transportation Systems Center, 2001). Furthermore, in addition to improving transportation safety and efficiency, it is also intended to “enhance the visitor experience and contribute to the preservation of park resources” (Plosky & Ritter, 2001, p. 1). This paper will address the relationship between crowding, congestion and safety to visitor attitudes toward ITS tools in national parks.

Perception of Crowding: Crowding norms have been based on a variety of factors including motivations, experience, attitudes and demographics (Manning, 1985). A study on river floaters by Ditton, Fedler and Graefe (1983) found that perception of crowding was related to visitors’ expectations, preferences, and previous experiences. The

perception of crowding has also been found to influence coping behaviors such as displacement (Kuentzel & Heberlein, 1992) and product shift (Shelby, Bregenzer & Johnson, 1988). Intrasite displacement was more common in the Apostle Islands study (Kuentzel & Heberlein, 1992), indicating that ITS tools may be a good fit for natural resource areas as they could help visitors determine where to go within a park.

Importance of Congestion: Perception of travel efficiency is related to the amount of traffic flow through a national park. Lappin (2000) found that the desire to travel efficiently was one of the characteristics of users of advanced traveler information systems (ATIS), an aspect of ITS. These users were attracted to the ATIS systems because they enabled the traveler to reduce stress, avoid congestion and save time. Thus, those who associated these tools with improving conditions are most likely to consider them acceptable in national parks.

Importance of Safety: Both visitors and managers have identified ITS tools as a way to increase safety (Frayer & Kroot, 1996), as have engineers (Lappin, 2000; Plosky, Maloney & Ritter, 2001). It is important to determine the extent to which safety is a concern to visitors to national parks, and whether this concern may lead to the use of ITS tools. If visitors associate ITS tools with an increase in safety, then they would be more likely to adopt these tools as coping mechanisms.

Methods

This paper is drawn from a study that was conducted in Golden Gate National Recreation Area and Sequoia and Kings Canyon National Parks. Both of these parks are located in California. Visitors were surveyed at each park during three separate periods in 2002. A random sample of park visitors was selected on site where a brief survey was completed by each contact. Each participant was then given a mail-back survey to return after their visit to the park. A modified Dillman approach was employed for each survey round. This approach endorses repeated follow-up with the contacted park visitors.

Attitudes toward transportation and travel planning tools in national parks were measured using an appropriateness scale. This was a five-point Likert scale ranging from inappropriate to appropriate. Respondents were asked to indicate how appropriate they believed that each travel planning tool was for use in national parks. The ITS tools included in the study were electronic message signs (both on the road to the parks and on park roads), Internet/computer terminal in parks, highway advisory radio, and personal data assistants (PDA). Regression analysis was utilized to determine which predictor variables (e.g. perception of crowding, importance of safety) best explained the attitude toward ITS. This type of analysis has been used to discern the strongest predictor variables in previous studies regarding attitudes (Ajzen, & Driver, 1992) and motivations (Lee, Scott, & Moore, 2002).

Results

Importance of safety was the only condition variable that proved to be a significant predictor of attitudes toward ITS tools in national parks. Specifically, importance of safe parking lots was found to be a predictor of attitude toward electronic message signs. Neither level of congestion nor perception of crowding was a significant predictor of attitude toward any of the ITS tools.

Discussion

As indicated above, intelligent transportation systems are geared toward several goals including reduction of congestion and improving safety. The finding that the importance of safety was predictive of attitude towards electronic message signs was important in regard to intelligent transportation systems. As the provision of safe conditions is a key objective of ITS, acceptance of ITS tools will be greater if their effectiveness in this regard is viewed positively by the users. Moreover, Lawler (1973) claimed that in order to predict possible behavioral choices you must identify the general classes or groups of outcomes that people find desirable or undesirable, and the factors that influence the desirability of outcomes. Thus, knowing that safety is important to some respondents, and that they identify one of the ITS tools with safety, indicates a higher likelihood that this tool may be used.

Potential Application

It is important for both managers and visitors to develop an understanding of the relationship between ITS goals (outcomes) and ITS tools. The view of these tools as a contributing factor toward, for example, less congestion is likely to increase the use of these items. However, further exploration of this connection will be necessary to determine its effect. It is possible that visitors do not relate the outcomes of using these tools with the tools themselves. Educating the visitors on the outcomes that can be achieved using these tools (e.g. less congestion, safer parking lots) may elicit a different response. Furthermore, a study that involves an examination of ITS tools already in place might provide more meaningful results.

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