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PROJECT SUMMARY REPORT 1744-S

# PROVIDING ADVANCED AND REAL-TIME TRAVEL/TRAFFIC INFORMATION TO TOURISTS

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16. Abstract

Advanced traveler information systems (ATIS) analyze and communicate information that can enhance travel efficiency, alleviate congestion, and increase safety. In Texas, tourists (i.e., tripmakers unacquainted with the state) constitute an important user group for ATIS. Given that tourism represents a sizable industry and, consequently, has an enormous impact on the state's economy, technology that enhances the tourist's experience can help sustain this sizable industry. However, such enhancement requires that traveler guidance be adequately provided. While tourists provide the principal users for this study, the development of ATIS is best accomplished by a comprehensive ATIS development approach that considers all possible user types. In this study, a synthesis of pertinent ATIS implementation and field tests, including methodologies for evaluating systems/technologies, was performed. Interviews with district-level staff in Texas were conducted to define the focus issues and the target users within each locality. On-location surveys were conducted and statistically analyzed according to the specific information needs of users. The study identified candidate systems/technologies that match the information needs, technical regulations, legal constraints, and compatibility with ITS standards and systems in Texas. Possible public and private sector roles and cost/benefit analyses were performed to identify the leading candidate system/technology alternatives. The study provides recommendations for developing the identified systems and for making necessary guidelines that could facilitate implementation.

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# PROVIDING ADVANCED AND REAL-TIME TRAVEL/TRAFFIC INFORMATION TO TOURISTS

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Project Summary Report 1744-S

Research Project 0-1744
*Providing Advanced and Real-Time Travel-Traffic Information to Tourists*

Conducted for the

**TEXAS DEPARTMENT OF TRANSPORTATION**

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## IMPLEMENTATION RECOMMENDATIONS

In light of the findings of this study, and based on the authors' synthesis of formal and informal experiences with advanced traveler information systems (ATIS) and their developments, the following implementation recommendations should be considered in the design of integrated travel information systems meant to provide real-time travel/traffic information to travelers unfamiliar with the area:

1. Travelers should be able to access information at multiple locations, including at the origin, along their route, and from inside their vehicles. While some of this capability ultimately resides with automobile manufacturers (e.g., Daimler-Benz's prototype Internet vehicle) and with the tripmakers' willingness and ability to pay for it, public agencies such as the Texas Department of Transportation have an important and essential role as the primary source of reliable traffic and public infrastructure information. The most flexible mechanism available to public agencies for making this information available to direct users and to "valued-added" private ATIS suppliers is the Internet. In addition, public agencies are the primary suppliers of out-of-vehicle information through roadside devices, and are the primary coordinators and authenticators of shared travel information data banks.

2. Redundancy in information provision is desirable. Travelers like to find the same information through different sources and display devices. The availability of several options among which travelers can alternate (depending on the situation) until they develop firm preferences encourages overall ATIS usage and reliance; it also increases ATIS overall usefulness and relevance to travelers.

3. Seamless coverage through one or more systems is extremely important in building users' reliance on and trust in ATIS-supplied information. Disruptions and gaps quickly erode customers' confidence, and can make a huge difference in the perception of ATIS as either essential travelers' aids or mere gadgets.

4. Whenever different information sources and display devices provide the same information, consistency in information provision is essential. While content may vary in terms of comprehensiveness of coverage or level of detail, accuracy and reliability should be comparable and conflicts must be avoided.

5. While various devices may display differently through different formats, some standardized user interfaces need to be encouraged and actively pursued, so as to allow for information display through various standardized formats (to be selected by the user). Parallels with the Windows PC format — a format responsible for the explosion and ubiquity of PC usage — could be useful in this regard.

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# PROVIDING ADVANCED AND REAL-TIME TRAVEL/TRAFFIC INFORMATION TO TOURISTS: PROJECT SUMMARY REPORT

Given that Texas tourism is a $27.5 billion business that generates some 464,000 jobs in the state, efforts to enhance services to Texas visitors can contribute substantially to sustaining and expanding this business. Thus, the broad objective of this research project was to identify a range of advanced traveler information systems (ATIS) to provide to Texas visitors real-time travel/traffic information that could enhance their convenience and satisfaction. ATISs collect, analyze, and disseminate various types of travel information to travelers to help improve their overall travel experience through greater safety and more effective choices. Such travel information pertains, for example, to activities at various destinations, parking availability, navigation and route guidance, traffic reports, special events, and weather reports. This study is one of the first attempts to (1) document travelers' use of and desires for information for the purpose of planning and conducting trips to unfamiliar areas, and (2) determine their desires and preferences regarding the kinds of ATIS capabilities to be deployed.

The project report contains an extensive synthesis of the state of the practice with regard to ATIS technologies and capabilities, including an up-to-date survey of currently deployed systems. ATIS devices can be categorized as out-of-vehicle, in-vehicle, and personal portable devices. Each category consists of both visual-based and audio-based devices. Out-of-vehicle devices are further classified into en-route and at-origin devices. Taken collectively, these systems and devices provide unprecedented opportunities for delivering pertinent and timely information to tripmakers virtually anywhere such information may be of use. The characteristics of each type of device and its information delivery mechanism are highlighted in the report, along with the experiences gained through deployment of these devices in different ATIS and field operational tests. To maximize the effectiveness and benefit of any particular ATIS or device, it remains essential to develop a

sound understanding of how such information may be used and of where and when it might be needed before and/or during a traveler's trip.

Previous studies and surveys of travelers' preferences for various ATIS features and information capabilities do not provide a sufficient basis for devising and designing ATIS strategies aimed at first-time visitors. Hence, the present study developed its own approach to obtain such information directly from the target population. In addition to conducting focus group sessions, we sent out a mail-back survey questionnaire, the responses to which documented travelers' actual use, needs, desires and preferences for information during the course of a specific travel experience—in this case a visit to San Antonio, a major tourist destination in Texas and the site of an ITS/ATIS model deployment demonstration. The focus group sessions were conducted in Austin.

The project report contains a detailed analysis of the focus group discussions and the survey responses with regard to traveler characteristics, travel planning and choices, and use of information in this process. Of particular relevance to the design and provision of ATIS are the following findings:

1. During the *trip planning* stages, the most frequently sought information by travelers included, in descending order, attraction information, map of the city, hotel information, restaurant information, prices at specific destinations, weather information, parking information, and transit schedule. The most frequently consulted sources of such travel information included, also in descending order of importance, word of mouth, visitors' bureaus, guide books, advertisements, the Internet, and travel agencies. Information sources such as TV, telephone, yellow pages, radio, printed transit schedules, and kiosks were less frequently used, the latter two being less frequently available than the others.

2. While in San Antonio, visitors most frequently sought and obtained the following information regarding the specific destinations to be visited (in decreasing order

of importance): location, directions, opening hours, entrance fees, special exhibits, children's activities, parking availability, and parking cost. Travelers depended to a greater extent on brochures, guide books, asking at hotels, asking friends/relatives, and calling the destination. Television, radio, and kiosks were less frequently consulted by travelers to obtain destination information.

3. Respondents were asked to rank five information items with regard to importance while touring an unfamiliar area. The following overall rank was obtained: destination information, navigation and route guidance information, travel mode information, weather reports, and finally traffic reports.

4. Respondents' stated preferences for different information sources included, in decreasing order, guide books, maps, word of mouth, phone calls, the Internet, travel agencies, TV, radio, personal electronic devices, and kiosks. Remarkably, low-tech conventional sources appear to be ranked ahead of newer technologies, undoubtedly reflecting the respondents' greater familiarity and perhaps overall satisfaction and comfort level with such conventional sources (see below).

5. By far the most important attribute to users of an information source or display device is its ease of use. Other important attributes, in decreasing order, include comprehensiveness of the information, portability of the device, ability to provide two-way communication, affordability, availability at fixed locations, ability to provide contact with a real person, compatibility within different areas, ability to provide updated information, and durability.

6. Most respondents indicated a preference for obtaining information in a graphical format, supported by either a verbal (auditory) or a textual format.

7. Individual differences among travelers are important in terms of information needs and preferences. Travelers are not identical and do not have identical needs. There is considerable diversity that dictates a necessity to provide a range of information items through a range of information sources. While this finding is not surprising, it is often ignored in traffic planners' attempts to identify a single "best" system that meets all needs. One conclusion of this study is that "one size fits all" is not a good strategy in devising and deploying ATIS. Systems that allow customization according to the needs of a diverse target population should be the goal of ITS and ATIS deployment.

8. We noted that travelers usually depend on more than one information source to obtain their desired information. No single device or information source was found by travelers to provide all the desired information or services. While lack of completeness is one factor that encourages such reliance on multiple sources, the need for *confirmatory* information is another equally, or possibly even more, important factor. Other factors include differential availability of different sources at different locations and different degrees of comprehensiveness that may be called for in different situations. The practical implication of this finding is to think of ATIS as something other than a single system that meets all possible needs.

9. Travelers' apparent preference and/or dependence on traditional sources of information (guide books, travel agencies, word of mouth)—as well as their lesser reliance on new information sources such as kiosks and personal communication devices—is undoubtedly a reflection of the lesser *availability* of the new information sources. The Internet, however, is increasingly being used by travelers, a reflection of its growing availability and market penetration. While respondents expressed a lack of familiarity with real-time information systems and devices, they also expressed an interest in having access to such information.

In addition to studying travelers' needs and preferences for information systems and devices, we conducted a survey of deployed ATIS infrastructure and capabilities in the following five metropolitan areas in Texas: San Antonio, Houston, Dallas, Austin, and El Paso. The intent of the survey was to determine whether the existing infrastructure in these areas in Texas could support ATIS and, if so, the type of ATIS capabilities that could be compatible with the infrastructure. The following conclusions can be made in this regard:

1. The three largest metropolitan areas (San Antonio, Houston, and Dallas) have considerably more extensive existing or planned deployment of ITS infrastructure than either Austin or El Paso.

2. This infrastructure is primarily deployed or planned along freeways to manage congestion. Most of the information provided pertains to traffic conditions along the freeways; in some cases the information may be such as to prevent congestion.

3. Most of the traveler information systems that are available are directed to automobile drivers. Other information systems that might benefit all travelers (i.e., transit users, bicyclists, pedestrians) planning a trip by different transportation modes are not available.

4. In most cases, information is provided en-route through variable message signs or via radio broadcasts. Other information display devices that can support pretrip planning, such as the Internet, kiosks, personal communication devices, etc., are still being designed or have only limited deployment.

5. The existing advanced public transportation systems (APTS) are intended to support the system operations, rather than to provide real-time information to travelers. Some advanced information display devices, such as kiosks, the Internet, and interactive telephone numbers, have been deployed to a very limited

extent to provide transit information. However, most of the existing public transit information is in the form of static information.

Considerable improvement in the experience of both travelers familiar with the area and those who are not could be achieved through the deployment of ATIS. It is recommended that an integrated approach to the design and deployment of such traveler information systems be pursued in the different metropolitan areas of Texas, within a common statewide ITS architecture. These integrated systems should be able to collect information from different sources, process the information, and then disseminate it through various media and information display devices. To allow for private sector value-added enhancement of the basic data, and to permit customization for target audiences, a common standard medium such as the Internet is recommended as a flexible and widely accessible platform for sharing information among agencies, providers, and end users. The data to be integrated could come from various sources, with such information including real-time traffic conditions (from traffic management centers), weather conditions (from weather centers), transit information, airport and flight information, and special events information. The data to be collected may be collected directly through publicly owned and operated infrastructures, or through other appropriate public or private entities.

In light of the findings of this study, and based on the authors' synthesis of formal and informal experiences with ATIS and their developments, the following should be considered in the design of integrated travel information systems meant to provide real-time travel/traffic information to travelers unfamiliar with the area:

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