

EVALUATION PLAN:

The Branson Travel and Recreational Information Program Field Operational Test



February 25, 1998

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16. Abstract The Branson Travel and Recreational Information Program (TRIP) is a Field Operational Test (FOT) of Traveler Information Services in Tourism Areas funded through the National Advanced Rural Transportation Systems Program. Over the past ten years, Branson, Missouri has grown to be known as the "live entertainment capital of the world." With more than 38 music and entertainment theaters, Branson attracts more than six million visitors per year. Its permanent population of just 4,400 swells to 40,000 during peak tourist season. Branson TRIP, built upon existing ITS infrastructure, is designed to provide enhanced traveler and tourist information in the area. The existing infrastructure includes Internet sites, Highway Advisory Radio (HAR) stations, traffic detection equipment, and changeable message signs. The new system will include a centralized database and control point for data collection/dissemination, additional surveillance equipment, a portable traffic management system, kiosks, low-cost Web terminals in strategic locations, enhanced Web sites, coordinated links to television and radio stations, as well as full area HAR coverage. The evaluation of Branson TRIP is being conducted by Battelle under the ITS Program Assessment Support contract with the Department of Transportation's ITS Joint Program Office. The evaluation will address technical challenges in developing ATIS applications in rural environments, institutional benefits and issues, usefulness of the information to the traveling public, effectiveness of various media to disseminate information to the public, and the overall impact of the information on traveler behavior. The evaluation strategy combines primary and secondary data collection and analyses for evaluating benefits and outcomes. Tourist intercept surveys, focus groups, personal interviews, and special "travel time/data accuracy" studies are the primary data collection methods that will be used. The evaluation will also make use of secondary data sources such as systems operational data (e.g., number of Web page hits) and historical traffic and accident data as a low-cost means of measuring impacts of various system components.				
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PREFACE

This document is part of a series of planning documents for the evaluation of Field Operational Tests of Traveler Information Services in Rural Tourism Areas (Branson TRIP and I-40 TTIS) prepared by Battelle, along with subcontractors BRW Incorporated and CJI Research, for the U.S. Department of Transportation's ITS Joint Program Office (DOT/JPO). Electronic versions of these documents are available through the ITS Electronic Document Library (EDL):

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As indicated below, selected document were published by DOT and are available through the National Technical Information Service (NTIS). Questions or comments concerning the documents in this series are encouraged and can be directed to:

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TABLE OF CONTENTS

	Page
Executive Summary	iv
1.0 Introduction	1
2.0 System Description	2
2.1 System Components	2
2.2 Schedule and Status	4
3.0 Evaluation Goals and Measures	4
3.1 Development of the Evaluation Plan	5
3.2 Revised Evaluation Measures and Example Hypotheses	6
4.0 Technical Approach	8
4.1 Surveys	8
4.1.1 Sampling Design	8
4.1.2 Questionnaire Development	9
4.1.3 Survey Operations	11
4.2 Focus Groups and Personal Interviews	12
4.3 Travel Time/Data Accuracy Case Studies	13
4.4 Systems Operational Data	14
4.5 Historical/Existing Traffic/Accident/Travel Data	14
4.6 Comparison with Other Projects	15
5.0 Management Plan	15
5.1 Organization and Responsibilities of the Evaluation Project Team	15
5.2 Schedule of Milestones and Deliverables	17
Appendix A - Results of the Evaluation Kickoff Workshop	A-1

List of Tables

Table 1. Evaluation Measures and Example Hypotheses to be Tested	7
Table 2. Question Areas for Main Questionnaire	11
Table 3. Allocation of Hours for Evaluation Team Members	17
Table 4. Schedule of Milestones and Deliverables	18

List of Figures

Figure 1. Branson Tri-Lakes Tourist Attractions	2
Figure 2. Branson TRIP System Overview	3
Figure 3. Branson TRIP FOT Evaluation Team	16

EXECUTIVE SUMMARY

The Branson Travel and Recreational Information Program (TRIP) is one of two Field Operational Tests (FOTs) of Traveler Information Services in Tourism Areas funded through the National Advanced Rural Transportation Systems Program. The I-40 Traveler and Tourist Information System (TTIS) in the I-40 corridor of northern Arizona was also funded under this program.

Over the past ten years, Branson, Missouri, has grown to be known as the “live entertainment capital of the world.” With more than 38 music and entertainment theaters, Branson attracts more than six million visitors per year. Its permanent population of just 4,400 swells to 40,000 during peak tourist season. Branson TRIP, built upon existing ITS infrastructure, is designed to provide enhanced traveler and tourist information in the area. The existing infrastructure includes Internet sites, Highway Advisory Radio (HAR) stations, traffic detection equipment, and changeable message signs. This new system will include a centralized database and control point for data collection/dissemination, additional surveillance equipment, a portable traffic management system, kiosks, low-cost Web terminals in strategic locations, enhanced Web sites, coordinated links to television and radio stations, as well as full area HAR coverage.

The evaluation of Branson TRIP is being conducted by Battelle under the ITS Program Assessment Support contract with the Department of Transportation’s ITS Joint Program Office. The evaluation will address technical challenges in developing advanced traveler information systems (ATIS) applications in rural environments, institutional benefits and issues, usefulness of the information to the traveling public, effectiveness of various media to disseminate information to the public, and the overall impact of the information on traveler behavior. The evaluation will focus on five goal areas. Some of the key measures associated with these goals are listed in the table below.

Evaluation Goals and Measures

Goal Area (Focus)	Evaluation Measures
Mobility (Traveler)	<ul style="list-style-type: none"> - Travel Time - Perceived Ease of Travel - Customer Satisfaction
Access (Destinations)	<ul style="list-style-type: none"> - Knowledge of Travel Options - Use of Alternative Modes and Routes - Perceived Availability of Options
Congestion (Transportation System)	<ul style="list-style-type: none"> - Number of Delays - Level of Service - Perception of Delay Frequency and Severity
Economic Development (Region)	<ul style="list-style-type: none"> - Duration of Visit - Intent to Return
Safety (Traveler)	<ul style="list-style-type: none"> - Number of Emergency Calls - Amount of Safety Information Available

While achieving the evaluation objectives of assessing impacts of ITS on mobility, access, congestion, economic development, and safety in rural tourist environments, the technical approach will also provide valuable information on the mechanisms for achieving these objectives. The evaluation study will answer such questions as, “Which components of the systems being deployed are the most successful? What worked? What didn’t work? How accurate is the information? Are travelers aware of the technology? Do they use the information? How do the systems change the behavior of the traveling public? How valuable is the information to the traveling public? Where do travelers prefer to get information? What type of information do they prefer? Does this technology improve the experience of the tourist?”

The evaluation strategy combines primary and secondary data collection and analyses for evaluating benefits and outcomes. Tourist intercept surveys, focus groups, personal interviews, and special “travel time/data accuracy” studies are the primary data collection methods that will be used. The evaluation will also make use of secondary data sources such as systems operational data (e.g., number of Web page hits) and historical traffic and accident data as a low-cost means of measuring impacts of various system components.

Evaluation planning began in February 1998 and will continue, along with baseline data collection, through the Spring of 1998. Pilot tourist surveys and focus groups are scheduled to occur in May or June, shortly after the planned deployment of the system. The main data collection period will be held in August of 1998. Preliminary results will be available in November 1998, and the final report in April 1999.

EVALUATION PLAN

FOR

**THE BRANSON TRAVEL AND RECREATIONAL
INFORMATION PROGRAM
FIELD OPERATIONAL TEST**

1.0 INTRODUCTION

The Advanced Rural Transportation Systems program is one of three major Intelligent Transportation Systems (ITS) program initiatives being pursued by the Federal Highway Administration (FHWA) in collaboration with local governments and industry. The Metropolitan Model Deployment Initiative (MMDI), in Seattle, Phoenix, San Antonio, and New York, and the Commercial Vehicle Information Systems and Networks MDI (CVISN MDI) in ten pilot and prototype states have been underway since 1996. In 1997, the FHWA expanded the ITS deployment activities in several rural applications. Currently, there are more than 50 active field operational tests (FOTs) among the three ITS program areas.

Two of the rural ITS projects selected by FHWA for this initiative are the Branson Travel and Recreational Information Program (TRIP) around Branson, Missouri, and the I-40 Travel and Tourist Information System (I-40 TTIS) in northern Arizona. The focus of these FOTs is to provide the traveling public with current, accurate information on traffic and travel conditions as well as tourist information such as national and state park information, local events, attractions, and accommodations. With an emphasis on ITS applications surrounding national or state parks and tourist areas, the objectives of the rural FOTs are to determine the degree to which Advanced Traveler Information Systems (ATIS) can improve mobility and access, relieve congestion, and thereby, help stimulate economic development in rural environments.

Branson, Missouri — 10 years ago a small town of approximately 4,000 known for wonderful outdoor recreational activities such as boating, hunting, fishing, and hiking in the Tri-Lakes Area — has grown to be known as the “live entertainment capital of the world.” With more than 38 music and entertainment theaters, the Branson area has more entertainment seating than the theaters on New York’s Broadway. Add to this the fact that Branson’s permanent population, now of around 4,400, swells to more than 40,000 (with an annual visitor population in excess of 6 million) during peak tourism season and the majority of traffic entering and leaving the area on two U.S. and state highways, traffic congestion has become a problem. In an effort to address these problems, the Branson Travel and Recreational Information Program (TRIP) project will build upon existing ITS infrastructure (Internet sites, Highway Advisory Radio [HAR] stations, traffic detection equipment, and variable message signs [VMS]) to enhance the overall picture of traveler information provided in the area. This new solution will include a centralized database and control point for data collection/dissemination, additional surveillance equipment, a portable traffic management system, kiosks, low-cost Web terminals in strategic locations, enhanced Web sites, coordinated links to television and radio stations, as well as full area HAR coverage.

An important component of the FOT is the independent evaluation of the effectiveness of the services. The evaluation is needed to assess the technical challenges in developing ATIS applications in rural environments, institutional benefits and issues, usefulness of the information to the traveling public, the effectiveness of various media to disseminate information to the public, and the overall impact of the information on traveler behavior.

2.0 SYSTEM DESCRIPTION

2.1 System Components

Branson TRIP is a regional traveler information system that will provide comprehensive information on tourist attractions (see Figure 1), weather, traffic, and road construction in the Branson/Tri-Lakes area. Each year, over six million visitors are attracted to the Branson area because of the availability of over 38 live music and entertainment theaters, numerous outlet malls and shopping centers, and various outdoor recreation opportunities. The major components of Branson TRIP are illustrated in Figure 2.

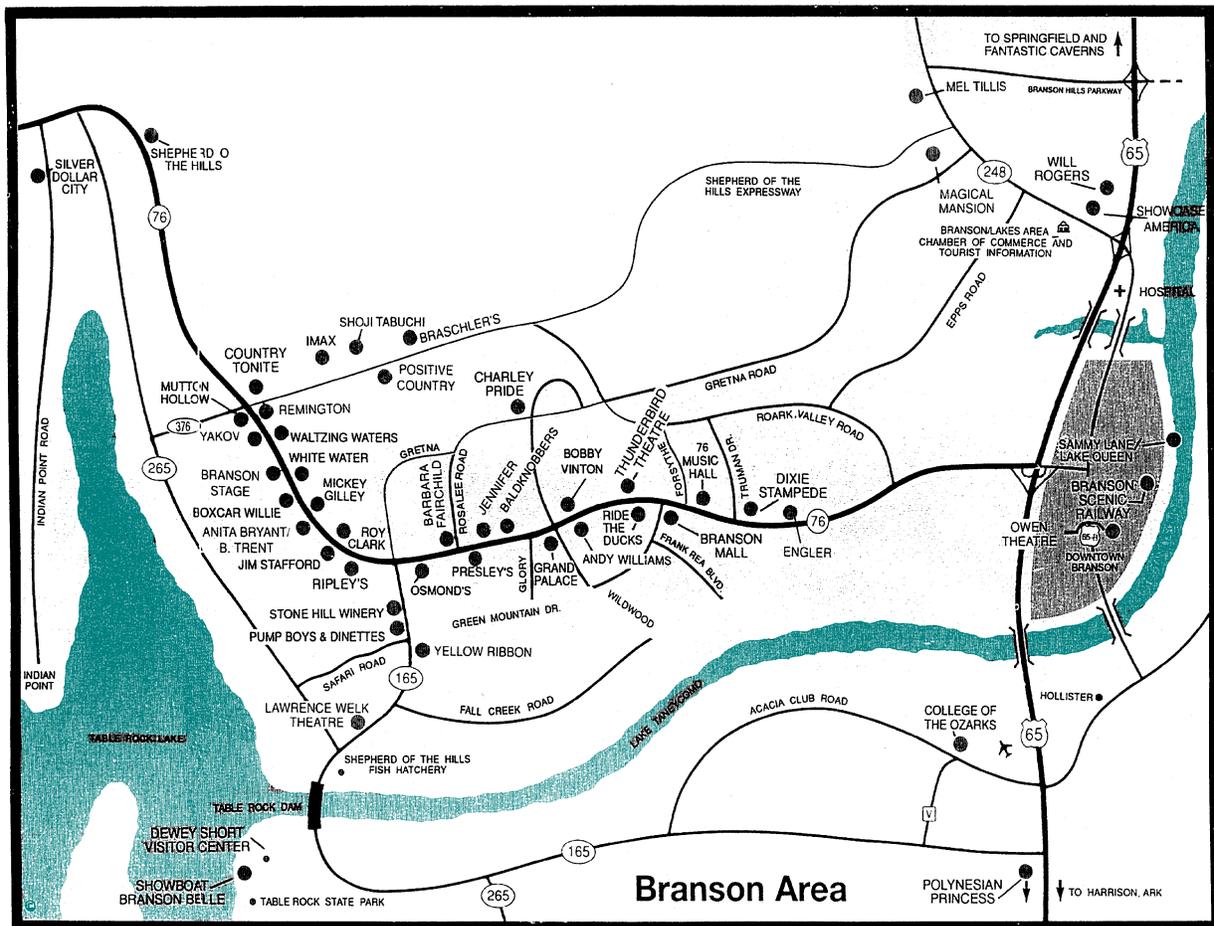
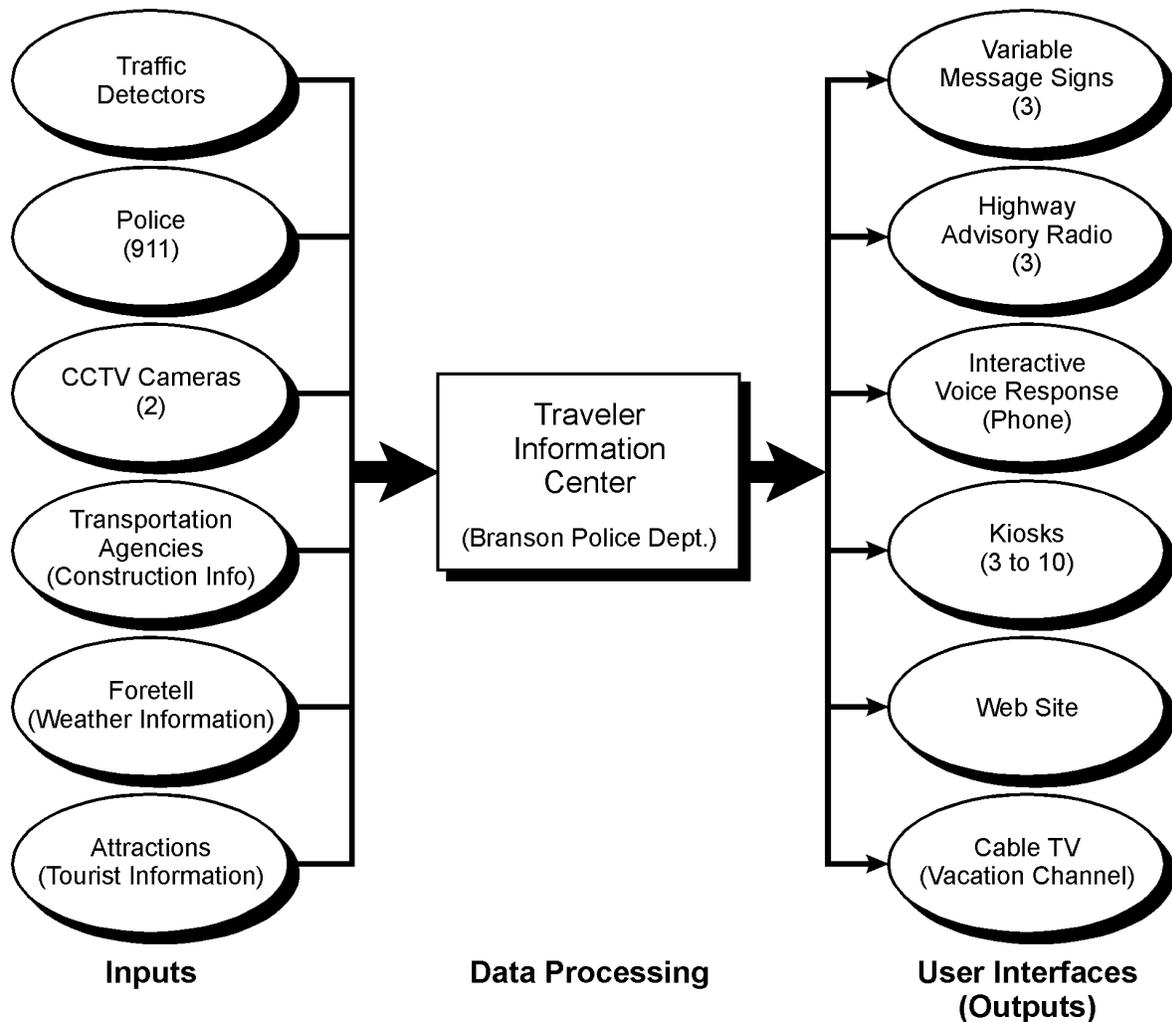


Figure 1. Branson Tri-Lakes Tourist Attractions

System Inputs

As shown in Figure 2, TRIP will collect information from a number of sources. Real-time traffic condition data will be collected using a combination of existing and new traffic detectors and two new



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Figure 2. Branson TRIP System Overview

closed-circuit television (CCTV) cameras. Information on planned roadway construction, including road closures and detours, will be collected from area transportation agencies and manually entered into the TRIP database. Branson police department 911 operators will enter information on traffic incidents and other relevant conditions. A privately operated information system, Foretell, will contribute regional weather information to the system. Schedules for events and shows and other tourist information will be collected from existing sources and added to the TRIP database.

Data Processing

TRIP information will be integrated within a central Traveler Information Center (TIC) database, located in and operated by the Branson police department. Police department employees will monitor traffic, verify conditions using the two CCTV cameras, and update variable message signs. The TIC computer system features a graphical user interface that alerts operators when traffic conditions change and is linked directly to traffic detectors, variable message signs, a highway advisory radio, a telephone information system, and a Web server.

User Interfaces (System Outputs)

TRIP information will be distributed to travelers en route using three Highway Advisory Radio (HAR) transmitters that broadcast on a single frequency and three portable, roadside variable message signs. The variable message signs will be located in advance of major route junctions and will provide brief messages that include referrals to the HAR system, which will provide more detailed information.

Pre-trip and en-route information will be provided by a telephone interactive voice response system, a World Wide Web site, kiosks, and commercial cable television. The interactive telephone system will provide route recommendations based on origin and destination information input by travelers using the telephone keypad. The Web site will incorporate information from existing area Web sites and will include traffic information from the TIC database, including still-frame CCTV images. Three kiosks, located at the airport and two visitor information centers, will provide access to the Web site. Also, up to seven low-power, personal computer Web terminals will be deployed at area hotels. The Branson commercial cable television channel also will include still-frame CCTV images from the TRIP system.

2.2 Schedule and Status

The design of the system is scheduled to be completed by June 1998 and operations are intended to begin in May or June 1998.

3.0 EVALUATION GOALS AND MEASURES

The rural ITS test program has five central goals: improve mobility, increase access, reduce congestion, stimulate economic development, and improve system safety. Although there is a substantial overlap among these goal areas, each goal has a slightly different focus. For this evaluation, the following definitions will be used:

Mobility refers to the ease of movement, or perceived ease of movement, as viewed by the traveler. Mobility can be increased by giving travelers accurate and timely information that enables them to make choices concerning travel routes or modes or trip start times. Traveler satisfaction is improved by avoiding unexpected problems en route or when arriving at the destination (e.g., canceled events), by reducing travel time, or simply by being aware of available options.

Access to attractions and other destinations is improved when travelers are aware of alternative travel options (modes or routes) or alternative attractions. Tourists provided with information on alternative attractions prior to starting the trip or while visiting the area might visit locations they had not previously intended to visit.

Congestion can be caused by problems with individual mobility and access. When travelers do not have accurate information on traffic conditions, event schedules, or alternative routes and attractions, congestion can result because too many people crowd into limited locations in a limited time period or remain in congested traffic when alternate routes are available.

Economic development has a macro- or regional-level impact. It may result, for example, from increased productivity of individual attractions as a result of better distribution of tourists among them. Tourists may be attracted to the area or stay longer and visit more attractions because of increased awareness of alternative attractions. They might spend more time and money in the area and return because of greater mobility and access.

Safety is a system-level outcome impacted by mobility and congestion. When travel is difficult, when knowledge of options and conditions is limited, and when facilities become congested, safety is

degraded. Safety is reflected in measures such as accident rates, accident severity, the number of “close calls” or “near-misses,” the number of 911 traffic accident calls, the number of emergency vehicle call-outs, and average incident response time.

These goal areas were developed in conjunction with the Branson TRIP team during a workshop conducted as part of the evaluation planning process (see Section 3.1). The final evaluation measures and corresponding hypotheses for the evaluation were developed using the results of the workshop. These measures and example hypotheses are presented in Section 3.2.

3.1 Development of the Evaluation Plan

Using information in the Branson TRIP FOT proposal and related planning documents, Battelle developed a preliminary evaluation *strategy* for the FOT. In developing the evaluation *plan*, the first step was to seek input from and secure the participation of various stakeholders. Stakeholders include federal, state, and local government agencies; local residents and business owners; and private FOT partners.

On February 6, 1998, a meeting was held with members of the Branson TRIP team, including members of the implementation team and steering committee. The purposes of the meeting were to:

- ! Present the proposed evaluation strategy to the Branson TRIP team,
- ! Obtain information from the Branson TRIP team on the types of changes that are expected following deployment,
- ! Review and prioritize the evaluation objectives,
- ! Identify ways in which the proposed evaluation strategy can be adjusted to best address the prioritized evaluation objectives, and
- ! Identify areas for coordination.

The meeting was attended by representatives from FHWA (Bob Thomas), MoDOT (Tom Ryan, FOT Project Manager; Angela Eden, Public Relations; Matthew Seiler, Area Engineer; Chris Haller; Dan Smith; and Bill Stone), local jurisdictions (Jerry Adams, Branson; W.K. Lewis, Table Rock Lake; and Tony Delong, Stone County), FOT Consultants (Erin Flanigan, Evaluation Liaison for Castle Rock/Black and Veatch), and the Evaluation Team (John Orban, Battelle Evaluation leader; and Matt Burt, BRW On-Site Evaluator).

After reviewing the proposed evaluation strategy, a workshop was conducted to accomplish the following objectives:

1. Identify anticipated changes associated with the ITS deployment.
2. Identify anticipated benefits of the ITS deployment.
3. Prioritize the benefits to be evaluated and identify the relevant data collection methods.

In identifying anticipated changes associated with the ITS deployment, workshop participants (members of the Branson TRIP team) were encouraged to think broadly and not to limit their input to benefits or ultimate outcomes. The changes that were identified are listed in Table A.1 in Appendix A.

Next, the participants listed the anticipated benefits of the Branson TRIP deployment. The results are shown in Table A.2 in Appendix A. Finally, the benefits were sorted into goal areas and the participants voted on the relative importance of evaluating each goal area. Each participant was given ten (10) total points to distribute. After ranking the benefit categories, participants identified data collection methods that would be appropriate for measuring the anticipated benefits associated with each goal area. The results of the ranking and data collection methods are presented in Table A.3 in Appendix A.

The following are the major conclusions of the workshop activity and of the evaluation kickoff meeting:

- ! The anticipated benefits of the technologies being deployed in the Branson TRIP FOT align fairly closely with the goal areas and “few good measures” presented in the proposed evaluation strategy. However, additional goal areas were added (safety and “other”).
- ! The proposed data collection methods are generally sufficient and appropriate to measure the anticipated benefits, especially the reliance on the survey and focus group/interview activities.
- ! Several specific examples of the role for system operational data and existing/historic data were identified.
- ! Measurement of congestion and safety-related and economic development outcomes (such as changes in accident rates or changes in roadway level of service) is not feasible within the evaluation time frame. However, baseline data can be identified for future analysis.

3.2 Revised Evaluation Measures and Example Hypotheses

Information about many different measures can be collected and related to each of the five goal areas. However, collecting all available information can be both expensive and time consuming, and as such, counterproductive. To improve the focus of the evaluation, a few good measures (FGM) in each of the five goal areas have been identified. Collectively, these measures are considered to be the key measures underlining the evaluation effort. In some cases, however, the FGM may be difficult to quantitatively measure or to obtain in a cost-effective and timely manner. Therefore, several surrogate measures that can be obtained in the evaluation time frame have also been identified. The FGM and their surrogates, presented in Table 1, were revised to incorporate the results of the kickoff workshop. For example, the Branson TRIP team indicated that a key measure for mobility is tourist satisfaction with their travel experience. Thus, this measure was added as another FGM.

The overall objectives of the evaluation will be translated into several specific hypotheses of interest. The FGM and their surrogates will be used to test these hypotheses. For example, some of the hypotheses that will be examined to evaluate improved mobility include: Are trip times among tourists using ITS shorter than trip times among tourists that do not use ITS? Does the perception of tourists using ITS on ease of travel differ from the perception of tourists not using ITS? Do tourists using ITS believe that it improved their mobility? If tourists were aware of and used ITS sooner, would they have stayed longer or attended more attractions? Examples of the various hypotheses that will be tested in each goal area are presented in Table 1. Also listed are the data collection methods that the February 6 workshop participants felt would be appropriate for addressing the hypotheses in each goal area.

Table 1. Evaluation Measures and Example Hypotheses to be Tested

Goal Area (Focus Area)	Few Good Measures	Surrogate Measures	Hypotheses	Data Collection Method
Mobility (Traveler)	<ul style="list-style-type: none"> Travel time Ease of travel Tourist traveler satisfaction 	<ul style="list-style-type: none"> Self-reported trip time for tourists using ITS versus those who do not Perceived ease of travel for tourists who are aware of and using ITS versus those who are not using ITS Actual trip time when using ITS and when not using ITS measured by "floating cars" or license plate recognition Perceived satisfaction of total travel experience 	<ul style="list-style-type: none"> Trip times of tourists using ITS are shorter than trip times among tourists who do not use ITS. Tourists who use ITS perceive travel to be easier than those who do not use ITS. Tourists who use ITS are more satisfied with their overall travel experience than tourists who do not use ITS. 	<ul style="list-style-type: none"> Survey Focus group/interviews Travel time/data accuracy case studies
Access (Destination)	<ul style="list-style-type: none"> Knowledge of travel options 	<ul style="list-style-type: none"> Mode of travel (use of alternative modes) Volume of traffic on alternative routes or in alternative parking lots Number of arrivals by time of day Actual and perceived availability of travel option information (number of sources, amount and type of information) 	<ul style="list-style-type: none"> Tourists who use ITS are more aware of travel options than those who do not use ITS. Tourists use alternative routes or travel modes due to ITS. Tourists perceive that they have increased access as a result of ITS. 	<ul style="list-style-type: none"> Survey Focus group/interviews System operational data Existing/historical traffic data
Congestion (Overall System)	<ul style="list-style-type: none"> Number and nature of delays Level of service (LOS) 	<ul style="list-style-type: none"> Perceptions of travelers who aware of and use ITS regarding the number and severity of delays versus the perceptions of those who do not use ITS Traffic volume and throughput Average travel speed Number of accidents Incident response time 	<ul style="list-style-type: none"> The average travel speed improved following ITS deployment. There are fewer delays due to incidents following ITS deployment. The percentage of traffic on main thoroughfares decreased after ITS deployment. Travelers who use ITS perceive fewer and less severe delays than those who do not. 	<ul style="list-style-type: none"> Survey Focus group/interviews Existing/historical traffic data
Economic Impact (Region)	<ul style="list-style-type: none"> Increased visitation Tourism revenue Increased awareness of alternative attractions 	<ul style="list-style-type: none"> Duration of stay Estimated expenditures throughout stay Intent to return Utilization of information outlets Number of attractions visited 	<ul style="list-style-type: none"> ITS users stay longer than non-ITS users. A higher percentage of tourists using ITS (as opposed to those not using ITS) indicate an intent to return. ITS users spend more during their stay than non-users. All ITS information outlets are used equally. 	<ul style="list-style-type: none"> Survey Focus group/interviews System operational data
Safety (Traveler)	<ul style="list-style-type: none"> Safety incidents Injuries, fatalities 	<ul style="list-style-type: none"> The number of calls made to the ITS system, law enforcement, and emergency services regarding roadway conditions The amount of information regarding safety that is available before and after implementation 	<ul style="list-style-type: none"> ITS deployment will result in fewer calls to law enforcement and emergency services regarding roadway condition information and therefore will increase the ability to respond to emergencies. More information regarding safety is available to travelers after ITS implementation. 	<ul style="list-style-type: none"> System operational data

4.0 TECHNICAL APPROACH

Many different sources of data and several different tools will be used to collect information to evaluate the success of ITS deployment in the Branson TRIP FOT. The primary source of information for this evaluation study will be collected from tourists using survey instruments and qualitative interviews. These study tools will provide information in all goal areas. In addition, a case study on travel time/data accuracy will be conducted to provide information on mobility. Operational systems data and historical travel/traffic data will be used to evaluate the effect that the deployment has on congestion and the economic impact. A more detailed discussion of the type of data that will be obtained as well as the strategy used to collect the information is presented below for each study tool.

4.1 Surveys

A key component to the evaluation will be information collected from tourist intercept surveys. Section 4.1.1 discusses the overall sampling design for surveying tourists. Section 4.1.2 contains a discussion on questionnaire development. Section 4.1.3 describes the survey operations and procedures.

4.1.1 Sampling Design

Information will be collected from tourists using two different survey instruments: a screening instrument (screening questionnaires) and a more extensive questionnaire (main questionnaire). The screening questionnaire will be short (about the size of a 3" x 5" index card), interviewer administered, and completed by a large portion of the population. The main questionnaire will be self-administered, will collect more information (both sides of one 8 ½" by 11" card-stock sheet), but will be given only to a subset of tourists.

There will be two separate data collection periods. The first collection period will be conducted shortly after deployment of ITS (in late May or early June) and will serve as a Pilot Study. The Pilot Study will be used to refine the survey instruments, gather information that can be used to refine sample size estimation, assess the level of cooperation from tourists and local businesses, and provide a limited amount of information on awareness of ITS shortly after deployment. The main data collection period will be held two to three months following the deployment of ITS (August/September).¹ A two- to three-month delay is needed to allow for an increased awareness of the ITS from local residents, business owners, and tourists. For example, it will take some time before hotel concierges become aware of and accept the new system and begin to direct tourists towards using ITS.

In both data collection periods, information from tourists will be collected using an "intercept" approach. That is, information is collected by "intercepting" tourists as they enter or leave a pre-specified attraction or location. This approach will be used, over other common approaches such as mail or callback surveys, because it will yield the highest possible response with the most reliable data (i.e., respondents are not asked for addresses or telephone numbers which people may be reluctant to give out nor does this method require extensive recall).

Two likely approaches to this study are to intercept tourists as they exit attraction parking lots or as they check out of local hotels. Both of these approaches will be employed for this evaluation. Using hotels has the advantage of a comfortable environment, which may increase the willingness of tourists to participate in the study. Parking lot interception allows information to be collected from that portion of

¹ The exact scheduling of the data collection periods will depend upon the deployment. Should the deployment be delayed, the second data collection period will be conducted in October.

the population not using hotels (i.e., day-trippers or campers). If the results of the Pilot Study reveal that a large component of the tourist population is not using hotels, more emphasis will be placed on intercepting potential participants as they enter/leave attractions and less emphasis will be placed on hotel-based intercepts. Conversely, if the Pilot Study demonstrates that a large proportion of the tourist population are overnight travelers, then more emphasis will be placed on hotel-based intercepts and less on attraction-based intercepts.

Information from several sampling locations will be collected using a two-stage cluster sampling design. First, in most cases, a sample of clusters will be selected (each cluster represents a group of tourists at a single hotel or parking lot) with probability proportional to the maximum bed capacity². In a few select cases, clusters will be selected with certainty. Sampling with certainty will occur if: (1) a particular hotel has indicated a high degree of willingness to participate, which results in substantial cost savings or substantially facilitates the logistics of collecting samples; or (2) a particular attraction or location is identified as a critical visitation site for tourists (e.g., a tourist information center). Next, in each of the selected clusters, a systematic sampling scheme will be employed to identify tourists for participation. That is, every nth person will complete a screening questionnaire (only one person from each family will complete a screening questionnaire). Everyone who indicates that they are aware of and have used ITS will be asked to complete a main questionnaire. For each person who is aware of and has used ITS, the next “unaware” person will also complete a main questionnaire. The exact number of primary clusters and the number of times that a systematic sample is drawn from each primary cluster will depend upon the costs associated with sampling from different primary clusters as well as the variability between primary clusters. The results of the Pilot Study will be used to ascertain both of these components and will allow us to determine the appropriate number of primary and secondary clusters to sample. However, we anticipate collecting a total of approximately 1,900 screening and 900 main questionnaires at approximately five sites (see Section 4.1.3).

4.1.2 Questionnaire Development

All survey instruments (questionnaires) will be designed to ensure easy administration and accurate data collection. In particular, they will include sufficient number of questions but will be compact enough to be easily completed in a relatively short period of time. During the pilot phase, several steps will be taken to construct the questionnaire:

- ! Qualitative interviews with key informants and site observations will influence question design and facilitate decisions on the balance of subject matter in the instrument.
- ! Also during the pilot phase, several small focus groups or qualitative interviews will be conducted with tourists and local residents. These will provide a consumer perspective on tourism travel issues.
- ! Existing data sources will be examined to determine feasibility and utility of including identical questions in the Branson survey for comparison to earlier periods.
- ! The characteristics of the Branson site will help determine some of the approaches and lines of questioning, and may limit the potential to compare to other FOT sites. For example, the Branson area includes various kinds of outdoor and indoor attractions ranging from fishing to concerts. There is both variety and physical dispersion of attractions. Therefore within the general Branson study area, there will be significant issues of mobility that need to be addressed in the questionnaire.

² A similar methodology will be employed to collect questionnaire information at parking lots that will be selected in proportion to maximum volume.

- ! The sampled population will have to be segmented. Surveys for purposes of understanding travel markets will be designed to capture several quite different populations: (1) local residents whose economy and whose own jobs may depend on the tourist trade and who have to cope with crowding and traffic at peak tourist seasons; (2) People coming to stay overnight, usually from a distance, thus incurring greater costs and having potentially greater economic impact per capita; (3) day-trippers who come for a day but do not stay overnight. The questionnaire and sampling designs will need to distinguish among these and determine approximate proportions of these populations in the local traveling public.

- ! Trip purposes and lodging characteristics will be especially important in Branson where RVs and boat trailers will influence lodging decisions and present particular mobility issues among many visitors.

- ! It is also important to distinguish between first-time and repeat visitors. This is especially important in a transportation study because repeat visitors can be expected to be more familiar than others with local routes and more familiar with options recommended by ITS (and thus either willing to take them or more likely to ignore them).

- ! Finally, a draft survey questionnaire will be pre-tested for ease of understanding and time of completion.

If the results of the Pilot Study indicate a need for languages other than English, the survey instruments will be translated into the appropriate languages. These translations will be performed using a repetitive translation, reverse translation technique to ensure that equivalent rather than literal meanings have been conveyed.

While specific wording of the survey questions is not yet known, the survey format and many subject areas are known. In general, the questions will focus on what is essential for the evaluation process, and will include questions to measure perceptions of mobility, access, experiences with congestion, items which describe the respondent's trips, awareness of and visitation to alternative attractions, awareness and use of ITS, demographics, and other characteristics. Question areas will include most of those presented in Table 2 and perhaps others determined after initial qualitative interviews and site visits.

As a practical matter, however, the number of items will have to be limited, and the total number of items may have to be either reduced from those shown in the following table, or spread between two "interlocked" surveys. The latter approach is appropriate when the sample is large and the number of questions has to be large as well; otherwise, the respondents would be unlikely to complete a self-administered survey in the midst of a vacation.

In such cases, two questionnaires can be used and the sample split. Each questionnaire would then carry a core of questions concerning awareness and use of ITS travel patterns. Other items would be divided between the two alternative survey forms.

In the pilot phase, we will observe the actual Branson site, including the variety of information sources, and attractions necessary to ask about, as well as the complexity of existing ITS systems in place. At that point we will make a decision whether to use the split-sample, interlocked questionnaire or a single sample with a single questionnaire.

Table 2. Question Areas for Main Questionnaire

Overall Question Area	Information to be Collected
Information Sources	<ul style="list-style-type: none"> # Planning this trip, non-ITS information sources used (e.g., travel agent, AAA) # Use of/familiarity with/comfort with electronic data sources
ITS	<ul style="list-style-type: none"> # Level of awareness of specific ITS sources of information (variable road signs, Web site, kiosks, tourist information sites, cell-phone access, and other sources implemented in the final test design) # Frequency of accessing each of these sources # Actual use of ITS travel information in reaching the general FOT area # Actual use of ITS travel information within the FOT area # Information desired, but not available
Overall Vacation Trip Characteristics	<ul style="list-style-type: none"> # Mode of local travel (tour bus and non-drivers screened out) # Origin/Destination # Hotel or other accommodation # Duration of stay (nights/days) # Number in party and ages # Purpose of local travel (recreation, worker) # Meal sources (restaurant, picnic) and number of meals out # Previous visits to same site (number, when) # Estimated expenditures (Note: In tourist studies it is often better to determine lodging nights, meals purchased, and events attended from the respondent, then derive expenditures from local industry cost averages. Method will be decided when the quality and availability of local data are known.) # Estimated travel time to the FOT local hotel in FOT
Local Travel and Visiting Characteristics	<ul style="list-style-type: none"> # Modal choice (drive/park and ride/other) # Flexibility of local travel plans – can routes, choice of times, and other choices be shifted in response to new information? # Estimated local travel times when using/not using ITS information # Congestion incidents encountered and traveler's response to it (includes use of ITS)
Satisfaction (if previous visit was made, comparisons of present visit will be asked)	<ul style="list-style-type: none"> # With information # With the overall driving/ traffic conditions of the trip # With mobility # With access # With congestion/lack of congestion # Intent to return
Demographics	<ul style="list-style-type: none"> # Age # Income # Education # Region of country # Type of vehicle # Extent of annual vacation travel # Gender

4.1.3 Survey Operations

Questionnaire information will be collected during two data collection periods by five interviewer teams. Each team will consist of two local residents who will be hired and trained expressly for this study. The data collection teams will be supervised by a full-time staff member. The first data collection period, or Pilot Study, will be conducted on approximately two days in late May or early June. The second, or main, data collection period will be conducted over approximately four days in late August or early

September. Each team will collect questionnaire information for at least six hours per day³. Further, it is anticipated that each team can screen approximately 10 tourists per hour and that one in four of the persons screened would have used ATIS at some time during their visit and would be willing to fill out the more detailed questionnaire. Thus, approximately 1,900 tourists will be screened (5 teams * 10 tourists per hour * 6 hours per day * 6 days), and main questionnaires will be completed by 900 tourists.

Prior to each data collection period, the interviewers will undergo a half-day training session where they will be trained on basic data collection techniques that emphasize the need for accuracy and attention to detail, as well as the necessity for legible and complete recording of data. The training will also include an explanation of the specific aims of this project along with question-by-question specifications for each item in the survey instrument.

Structured group role-playing will be used to ensure that each interviewer is comfortable with the data collection procedures. Specific training in methods to prevent refusals and to persuade reluctant subjects will be provided. Training will continue throughout the data collection process. Data collectors will be given feedback by supervisory staff on errors and how to correct them. During data collection, data collection staff will be required to conduct their activities in the manner prescribed at training.

To encourage a high response rate from tourists, all staff will appear professional and courteous at all times. Interviewers will dress appropriately for the weather in clothing that is not offensive to others. In addition to photo identification badges that indicate the study title and interviewer's name, data collection staff will have uniform hats or T-shirts that identify the study and can be spotted from a distance.

Money has been allocated in the budget for respondent incentives. The exact form of the incentives will be determined with input from both the COTR and the local FOT staff and will be dependent upon the precise mode of data collection. For example, if tourists are approached in a hotel lobby we may be able to offer coupons for a free breakfast in the hotel restaurant. Incentives will be appropriate to the time commitment required for the survey. Tourists who are stopped in a parking lot and asked screening questions for 5 minutes may receive no incentive, while tourists who are asked to complete a 30-minute interview might be offered \$10 for their time and effort. Again, the extent and nature of the incentives will be finalized following the Pilot Study.

An on-site review of all forms for completeness and accuracy prior will be conducted. Forms will then be mailed to Battelle and manually edited for completeness, accuracy, and consistency by editors who have been trained specifically for this project. Data will be verified manually using a 10 percent re-edit of the data entry and by electronic data cleaning. All errors flagged during the electronic data cleaning effort will be researched and the correct answer entered into the database.

4.2 Focus Groups and Personal Interviews

Qualitative interviews of two kinds will be used to supplement the quantitative information gathered in the Pilot Study and main data collection portion of the project. These qualitative interviews will include both key informant interviews and focus groups.

The results of baseline surveys and interviews conducted by the FOT team will be reviewed and, in cases where respondents may provide useful "post-implementation" comment, follow-up qualitative interviews

³ If necessary, the data collection may be spread over additional days and times during those days to ensure that information is collected from a representative sample of the tourist population. In all, 120 hours will be spent conducting the intercept surveys during the Pilot phase and 240 hours will be spent conducting the intercept surveys during the main collection stage.

or focus group sessions will be conducted. Small scale focus groups or interviews may also be conducted with other groups of people including hospitality industry workers who commute; tour bus drivers; various managers of sites, hotels, and restaurants; workers in supervisory positions; local police; and ITS operators.

Prior to and during the quantitative survey itself, tourist respondents will be screened and those who meet certain characteristics will be invited to focus groups to be conducted over an early breakfast before the typical tourist day begins. The mix of respondents will be determined at the time of the Pilot Study. In the Branson area, this mix of participants will include day-trippers, residents, and overnight vacationers. Given the compressed time and variety of settings in which these people will have to be recruited, it will not be possible to specify precisely the proportions of persons to be contacted in each of these segments. But the views of each are important and need to be gathered.

In accord with standard industry practice, participants will be paid cash incentives to provide motivation independent of the subject itself. This assures that interest in ITS does not bias attendance in the groups. The groups will be small scale (three or four persons, one hour) because time is scarce and costly during vacations, and because large groups would be difficult to schedule. Sites for the group discussions will be determined during the Pilot Study period.

The focus group discussions will be *focused* on issues of local travel in the Branson area. The primary purpose at the pilot stage is to determine the scope of issues involving access to the sites and mobility within the sites. Groups held during the main data collection stage will provide in-depth information and examples of experiences with traffic, site-finding, and use of ITS. Trip planning behavior and trip purpose (vacation, business, etc.) will be characterized. The groups will be professionally facilitated and the results tape-recorded for later analysis.

If only a small percentage of tourists are aware of or use ATIS components, several of the tourist focus groups will be replaced with a series of test-site case studies. Here, a small sample of tourists will be exposed to an ITS component, then asked to comment on what they learned. For example, at kiosk sites, tourists could be intercepted and asked to use the kiosk, then respond to questions related to their understanding of the technology, satisfaction with the device or the information, or planned use of the information obtained.

4.3 Travel Time/Data Accuracy Case Studies

The roadway network in the Branson area has, along with a single predominant corridor (Route 76), a number of closely spaced, alternative routes, such as Shepherd of the Hills Parkway, Roark Valley Road, Gretna Road, and Green Mountain Drive. This configuration makes the examination of ATIS impacts on travel time in the Branson area feasible and appropriate. Several methods are being developed to address travel time impacts and to assess the accuracy of reported traffic information by correlating traveler advisory information with observed conditions.

The tourist surveys described in Section 4.1 will capture travel time information by relying upon recall data. Previous FHWA studies have shown that drivers tend to round recalled travel times to multiples of five while the true distribution of times are more variable. To gather an accurate measure of true travel times once the ITS systems are deployed, Battelle will collect actual travel time data using two methods. First, we will approach employees who live around the study areas and travel to the tourist sites on a regular basis. Employees driving from all directions and at differing times of the day and night will be asked to keep a weekly log of their actual drive time. These logs will collect the date of the trip, the exact start and end times, the route followed, any delays encountered, and any ITS information utilized. These residents will be paid \$10 in appreciation for their time spent participating in the study. Businesses that are partners and affiliates of each FOT (e.g., Silver Dollar City and Bass Pro Outdoor

World) will be approached for their assistance in identifying employees who are willing to collect these data.

As a second way to collect actual travel times, the local data collectors hired by Battelle will be asked to drive specified routes at specified times of the day. Prior to beginning their drive, these individuals will first collect as much ITS data as possible. They will consult the kiosks, access the Web sites, listen to radio reports, etc., and document all information provided about their intended route and destination. As they then drive the route, some drivers will stay on the planned route regardless of any suggested detours and others will follow the ITS suggestions collected prior to the trip or discovered along the way (e.g., from road signs or updated radio broadcasts). These drivers will maintain logs of their trips similar to those mentioned above but with the added feature of documenting the accuracy of the ITS data. For example, if told about an accident to avoid, the driver will note whether or not the accident scene was still blocked when they attempted to drive through it. After the trip, a comparison will be made between the ITS information provided and the actual route conditions.

In addition to providing actual travel time measures, these case studies will yield a great deal of information about the usefulness and accuracy of the ITS systems. They will provide data on mobility once ITS is deployed and on the potential for ITS to help travelers make the right travel decisions. Both of these data collection methodologies should be easy to implement and inexpensive. However, they will provide a great deal of valuable information that will add to the overall evaluation of the Branson TRIP.

4.4 Systems Operational Data

As shown in Table 1, the system operational data will be used to examine issues related to access and congestion. There are a number of specific opportunities that will be investigated as the system design is completed, and will be incorporated into a detailed test plan.

- ! Travel advisory information for comparison to observed travel times and conditions (see Section 4.3)
- ! Number, type, content, and utilization of traveler information dissemination tools as a measure of the awareness of ITS (this could include tabulation of the number of calls to phone systems, the number of visits to kiosks or Web sites, etc.).

However, as indicated in Table A.3 in Appendix A, if the evaluation measures cannot be effectively associated with the ITS deployment, the emphasis of the system operational data will be on identifying data for use in future longitudinal analyses of benefits.

4.5 Historical/Existing Traffic/Accident/Travel Data

As with system operational data, the emphasis on historic and existing data will be to examine issues of access and congestion. Also, the possible comparison of traveler satisfaction data (from surveys and focus groups/interviews) to previous area surveys will be performed if analysis of these data sources indicate that the comparison is appropriate. There are several ongoing marketing-oriented surveys being conducted by individual businesses and the Chamber of Commerce. Also the Intermodal Transportation Study was conducted for Stone County, Taney County, and the City of Branson.

The evaluation will also identify data for use in future longitudinal analyses of benefits which cannot be effectively associated with the ITS deployment within the available evaluation time frame. This might include data on traffic, accident, and economic measures.

4.6 Comparison with Other Projects

The Branson TRIP is a unique project in that it focuses on a predominantly tourist audience for traveler information in a small urban community. As a result, there are few opportunities to compare evaluation results to equivalent projects.

Thus, the comparison of Branson TRIP results to other comparable projects will be focused on the following:

1. Comparison of results between Branson TRIP and comparable portions of the I-40 TTIS
2. Comparison of components of the Branson TRIP with components of urban traveler information systems (the general literature on traveler information preferences and results from MMDIs) and with components of other rural and/or tourist-oriented traveler information systems, including the Yosemite Area Traveler Information system (YATI) and other relevant projects identified as part of a literature scan.

5.0 MANAGEMENT PLAN

The organization and responsibilities of the evaluation project team are presented in Section 5.1. Project schedules and deliverables are provided in Section 5.2.

5.1 Organization and Responsibilities of the Evaluation Project Team

The evaluation of Branson TRIP is being conducted by Battelle under the ITS Program Assessment Support (IPAS) contract with DOT's ITS Joint Program Office (JPO). Dr. Joseph Peters, the ITS Program Assessment Coordinator for the JPO, serves as the contracting officer's technical representative (COTR) for the IPAS contract. He will also serve as the Government's Task Order manager for this evaluation project. Mr. David Norstrom is Battelle's IPAS Program Manager.

As Evaluation Leader, Dr. John Orban will provide the overall direction to the evaluation team and maintain routine communications with Dr. Peters and Mr. Thomas Ryan, the FOT Project Manager. Dr. Orban will be supported by several key staff, as shown in Figure 3.

Mr. Matt Burt, the on-site evaluator, will have the principal role in working with the local partners to refine the evaluation goals, objectives, and measures. He will then work with the rest of the project team, under the direction of Dr. Orban, to develop a data collection and analysis approach that is technically sound and achievable within time and budget constraints. Mr. Burt will also work with the local partners to prepare systems descriptions and collect systems operational and historical data and work with Mr. David Williams to address issues related to ATIS architecture and synergies with other programs. Mr. Bennett Pierce will be responsible for survey design and statistical analysis, Dr. Hugh Clark will lead the development of the survey questionnaires and conduct focus groups, and Ms. Diane Burkom will have management responsibilities for the survey operations. The level of effort planned for each project team member is shown in Table 3.

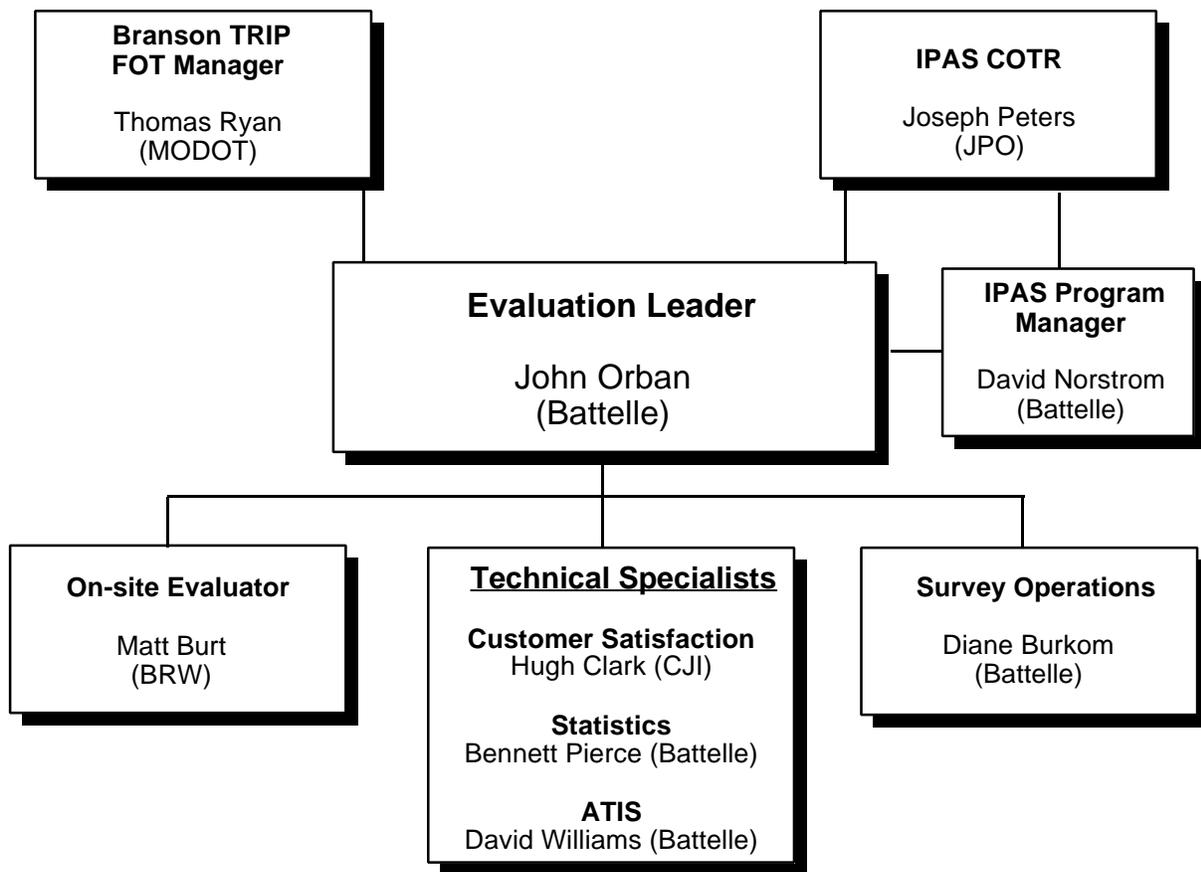


Figure 3. Branson TRIP FOT Evaluation Team.

Table 3. Allocation of Hours for Evaluation Team Members*

Name	Project Role	Task							Total
		1	2	3	4	5	6	7	
Key Personnel									
J. Orban	Task Manager and Evaluation Leader		20	50	20	20	40		150
M. Burt	On-Site Evaluator		120	150	190	100	60	80	700
H. Clark	Customer Satisfaction Study Leader		42	30	40		32		144
D. Williams	ATIS Specialist		20				20		40
B. Pierce	Statistician		15	15			80		110
D. Burkom	Survey Operations Manager		10	15		90	15		130
Support Staff									
M. Greene	Data Collection Supervisor				30	120			150
B. Herman	Data Preparation Supervisor				14	56			70
I. Sung	Programmer/Data Manager						100	100	200
Support/Administrative Staff (BRW)			10	30	14	6	20		80
Data Collection Crew (including data cleaning, editing, etc.)					292	1168			1460
Secretarial Support			8				28		36
									3270

* Includes evaluation of Branson TRIP and I-40 TTIS FOTs.

- Task 1. Strategy
- Task 2. Plan
- Task 3. Test Plans
- Task 4. Baseline Data
- Task 5. Data Collection
- Task 6. Report
- Task 7. Integration Report

5.2 Schedule of Milestones and Deliverables

The Battelle Team will accomplish the evaluations of the Branson TRIP and I-40 TTIS FOTs within a 16-month completion schedule. Table 4 summarizes the deliverables.

Table 4. Schedule of Milestones and Deliverables

Documentation	1998												1999				
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	
Preliminary Evaluation Strategy	◆																
Evaluation Status Report (2)*		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Evaluation Kickoff Meetings		◆															
Evaluation Plans (2)*		◆															
Detailed Test Plans (2)*				◆													
Design Completed and System Operational					◆												
Data Collection					◆	◆	◆	◆	◆	◆							
Pilot Survey						◆											
Full-Scale Survey								◆									
Summary of Preliminary Results (2)*											◆						
Final Evaluation Report (2)*																	◆
Integrating Summary Report																	◆

* Battelle will submit separate reports for Branson and I-40.

◆ Milestone or Deliverable

APPENDIX A

Results of the Evaluation Kickoff Workshop

Table A.1
Anticipated Changes
(February 6, 1998, Evaluation Strategy Workshop)

- ! Better information to travelers (pre-trip, en-route, destination).
- ! Effective diversion of traffic to alternate routes.
- ! Create a *model* for rural ATIS deployment.
- ! Balance economic development across all routes/facilities.
- ! Agencies more informed regarding travel patterns.
- ! Create marketing opportunities for local business.
- ! Revenue generation for infrastructure.
- ! Gain input on infrastructure needs and priorities.
- ! Confirmation that alternate routes are being utilized (input to planning/investment).
- ! Provide pre-visit information.
- ! Central location for traveler and traffic information.
- ! New approach and attitude (don't just *attract* the visitor, serve them through their stay).
- ! Visitors/residents happier with experience.
- ! Both tourists and residents served and satisfied.
- ! Increase patronage and revenues.
- ! Improve emergency response.
- ! Reduce congestion and shorten travel times.
- ! Reduce accidents.
- ! Encourage longer stays.
- ! Stimulate *repeat* visitation.
- ! Stimulate retirement population growth.
- ! Promote development of new businesses/industries (general economic development).
- ! More access to accurate weather information.
- ! More access to accurate construction and maintenance information.
- ! Stimulate entire region (southern Missouri and Arkansas).
- ! Ramifications of population growth (e.g., crime).
- ! Potential impact on tour bus business.

Table A.2
Anticipated Benefits
(February 6, 1998, Evaluation Strategy Workshop)

- ! Safer transportation system.
- ! Improved transportation system efficiency (use of alternate routes/modes/etc.).
- ! Improve visitor satisfaction.
- ! More coordinated and accurate marketing data.
- ! Increased repeat visits.
- ! Improve infrastructure *planning* tools.
- ! Improved *operations* data/tools.
- ! Reinforce MoDOT ITS leadership role.
- ! Promote overall awareness of ITS.
- ! Improve regional awareness and synergy.
- ! Stronger economy.

Table A.3
Benefits by Goal Area, Goal Area Ranking
and Data Collection Methods
(February 6, 1998 Evaluation Strategy Workshop)

Goal Area/ Focus of Goal Area	Anticipated Benefits	Total Score	Data Collection Methods⁽¹⁾
Mobility (Individual Traveler Orientation)	! Improve visitor satisfaction	41	A, B, D, E ⁽²⁾
Access (Destination Oriented)	! Transportation system efficiency (use of alternate routes/modes/etc.)	-- ⁽³⁾	
Congestion (Overall System Orientation)	! Transportation system efficiency (use of alternate routes/modes/etc.) ! Improved infrastructure planning tools/data ! Improved operations data/tools	30	C, D ⁽⁴⁾
Economic Development (Regional)	! More coordinated and accurate marketing data ! Increased repeat visits ! Improve regional awareness and synergy ! Stronger economy	23	A, B, E ⁽⁴⁾
Safety	! Safer transportation system	12	B, D ⁽⁴⁾
Other	! Reinforce MoDOT ITS leadership role ! Promote overall awareness of ITS	4	A, B

⁽¹⁾ Data Collection Methods

- A = Tourist Intercept Survey
- B = Focus Group/Interviews
- C = Travel Time/Data Accuracy Case Studies
- D = System Operational Data
- E = Existing/Historic Data

⁽²⁾ Possible use of/comparison with other surveys in the region.

⁽³⁾ This goal area was found to overlap other areas.

⁽⁴⁾ Direct measurement of project impact not feasible during limited evaluation time frame, but baseline data can be saved for use in future evaluations.