T E S T   P L A N :

I-40 TTIS (Traveler and Tourist Information System) System/ Historical Data Analysis

May 20, 1998

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TEST PLAN

I-40 TTIS System/Historical Data Analysis

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Prepared for:

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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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Title	Date	DOT Report No.
Evaluation Plan: The I-40 Traveler and Tourist Information System Field Operational Test	February 25, 1998	FHWA-JPO-99-028
Test Plan: I-40 TTIS Tourist Intercept Survey	May 18, 1998	FHWA-JPO-99-029
Test Plan: I-40 TTIS Focus Groups and Personal Interviews	May 18, 1998	
Test Plan: I-40 TTIS System/Historical Data Analysis	May 20, 1998	
Test Plan: I-40 TTIS Route Diversion Study	May 20, 1998	
Evaluation Plan: The Branson Travel and Recreational Information Program Field Operational Test	February 25, 1998	FHWA-JPO-99-027
Test Plan: Branson TRIP Tourist Intercept Survey	May 29, 1998	
Test Plan: Branson TRIP Focus Groups and Personal Interviews	May 29, 1998	
Test Plan: Branson TRIP System/Historical Data Analysis	June 1, 1998	
Test Plan: Branson TRIP Travel Time/Data Accuracy Test	June 1, 1998	
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FOR

THE I-40 TRAVELER AND
TOURIST INFORMATION SYSTEM
FIELD OPERATIONAL TEST

1.0 INTRODUCTION

The Branson Travel and Recreational information Program (TRIP) in Branson, Missouri, and the I-40 Traveler and Tourist Information System (TTIS) in the I-40 corridor of Northern Arizona are two Field Operational Tests (FOTs) of Traveler Information Services in Tourism Areas funded through the National Advanced Rural Transportation Systems Program.   The evaluation of Branson TRIP and the I-40 TTIS is being conducted by Battelle under the ITS Program Assessment Support contract with the Department of Transportation's ITS Joint Program Office.

As part of the overall evaluation, several tests have been planned. This document serves as a detailed test plan for one such test: system and historical data.   Section 2.0 of this plan summarizes the approach and the remaining sections present specific details for implementing the approach.

The rural ITS test site programs (I-40 TTIS and Branson TRIP) have five central objectives: improve mobility, increase awareness, reduce congestion, stimulate economic development, and improve safety. This test uses data generated by the TTIS, referred to throughout this Test Plan as "system" data, to document the functioning of the data collection and dissemination functions of the TTIS, functions which must successfully be accomplished in order to acheive the ultimate objectives listed above. System input analysis will include quantification of the type of information, quantity, source, and time of input. The same data, including type, source (e.g., kiosk, telephone line, etc.), quantity and timing, will be documented for system outputs. Additional system data that will be collected includes descriptive information, such as the number of PrePass transponders deployed and the number of PrePass trans-actions and anecdotal information from agency staff responsible for inputting data into the TTIS database. This test will also document the private sector financial contribution to the TTIS deployment. This measurement addresses the Arizona Department of Transportation (ADOT) objective of identifying alternative funding sources for ITS deployment.

This test utilizes historical data in two ways. First, the results of the survey conducted for this evaluation will be compared to the results of several recent surveys that include data on travelers' awareness and use of various information sources. Second, the historical number of Department of Public Safety (DPS) "information request" telephone calls will be compared to the volume of calls received after implementa-tion of the TTIS, which is intended to reduce the number of these types of calls to the DPS. The number of calls to the Voice Remote Access System, ADOT's telephone roadway information line, will also be tracked.

2.0 APPROACH

The sections that follow describe the overall approach for the analysis of various system and historical data. Generally, data for this test will be collected on a periodic basis over the course of the evaluation period and no major data collection exercises, such as a survey or field analysis, will occur. The data will be analyzed first in October 1998, and the results will be documented in the November 1998 Summary of Preliminary Results report. Data will be collected through February 1999, and the final analysis and results will be documented in the April 1999 Final Evaluation Report.

2.1 System Data

2.1.1 System Inputs

System inputs will be documented using a matrix identifying the number of inputs to the Highway Closures and Restrictions System (HCRS), the central database for the TTIS, listed by source and type. The HCRS client workstations deployed at agencies throughout the corridor represent the potential sources of information. Workstations are being deployed at 12 agencies. The type of information input to the system will be identified according to 21 different categories of ITIS (International Traveler Information Interchange Standard) codes. An example of the type of matrix that will be utilized is shown in Table 1.

The matrix will be generated monthly, so changes over the course of the evaluation period can be identified. Additionally, the time and day of the week that messages of different types are input will be identified, and can be differentiated by source (HCRS client workstation).

The I-40 TTIS is somewhat unique in terms of the large number, diversity and widespread geographic distribution of agencies that will be entering information directly into the central database. The analysis of system inputs by type, source, time and quantity will help evaluate the I-40 TTIS strategy of widely distributed system input responsibilities by showing which types of agencies provide input on different types of conditions and in what quantity.

2.1.2 System Outputs

Table 2 identifies the information on TTIS outputs that will be collected. The analysis of those data will identify which sources of information were used most frequently, what types of information were accessed most frequently, and when the data were requested.

2.2 Historical Data

2.2.1 Previous Traveler Surveys

The results of the TTIS evaluation traveler surveys will be compared to the results of three previous surveys of Arizona travelers that have been conducted over the last several years. It is not expected that these comparisons will necessarily provide definitive conclusions relative to the effectiveness of the TTIS. However, they will help place the TTIS survey results within a broader context, may aid in interpretation of TTIS survey results, and will add to the body of knowledge on Arizona traveler attitudes. Each of the historical surveys and planned comparisons are summarized below.

Table 1.   Example HCRS Inputs Matrix

| Highway Closures and Restrictions System (HCRS) Inputs | | | | | | | | | | | | | | | | | | | | | |
| International Traveler Information Interchange Standard (ITIS) Codes | | | | | | | | | | | | | | | | | | | | | |
HCRS Client Workstation	1 - Level of Service	2 - Incidents/Accidents	3 - Closures	4 - Lane Restrictions	5 - Road Maintenance	6 - Obstructions Hazards	7 - Road Conditions	8 - Weather	9 - Winds	10 - Environment	11 - Temperature	12 - Activities	13 - Delays/Cancellations	14 - Dangerous Vehicles	15 - Exceptional Loads	16 - Trafic Equipment Status	17 - Traffic Regulations	18 - Headways	19 - Travel Times	20 - Parking	21 - Information	Total
Bullhead City 911 Operators																						
National Weather Service																						
Flagstaff DPS Dispatchers																						
Grand Canyon National Park																						
Transit																						
DEMA																						
CALTRANS																						
New Mexico DOT																						
Utah DOT																						
Navajo Nation																						
Winslow Chamber of Commerce																						
Forest Service																						
Total																						

Table 2.   System Outputs Data to be Collected

User Interface	Information to be Collected
Variable Message Signs	• Total number of messages by type, by location, month and week • Average number of messages by type, by location, month and week • Average duration of messages by type by location • Total percentage of time that messages were displayed by location by month
Voice Remote Access System (Roadway conditions telephone information line)	• Total number of calls by month • Total number of messages by route and by month • Number of data requests by route and by month • Number of calls by time of day and day of week • Average number of routes that information was requested for • Average duration of telephone calls
Personal Remote Access System (HCRS and Foretell Plus Internet Web Pages)	• Total number of "hits" on main pages [1] by month, time of day and day of week • Average duration of session by time of day • Average duration of session by day of week • Total Number of "hits" on sub-pages by month, time of day and day of week • Number of total site visits by country of origin • Number of total visits by state of origin • Number of total visits by city of origin
Kiosks	• Total number of "hits" by location, month, time of day and day of week • Average duration of session by time of day • Average duration of session by day of week • Total number of "hits" on sub-pages/screens by location, month, time of day and day of week

[1]   For the ADOT Internet web site, the "Closures" page will be considered the main page, since it is the location from which all Northern Arizona/I-40 information is accessed.

Arizona Quality Initiative Survey of Highway Users and Community Leaders

This survey was conducted by the Arizona Department of Transportation in 1997 and was intended to determine the attitudes and opinions of residents and community leaders regarding the state's transportation system. In-depth telephone surveys were conducted between January and March 1997 with 2,035 Arizona residents. Table 3 presents some of the comparisons that may be made between the TTIS survey and the Quality Initiative Survey.

Table 3. Potential Comparisons Between TTIS Survey and Arizona Quality Initiative Survey

TTIS Survey Question [1]	Quality Initiative Survey Question [1][2]	Analysis Logic
(Screening Questionnaire) #7 - Before you left on your trip, were you aware of a telephone information line or an I-40 Internet site? #8 - While driving in Arizona on I-40 or I-17, were you aware of kiosks or variable message signs?	#25 - Are you very familiar, somewhat familiar or not familiar with variable message signs and the Internet?	The percentage of people aware of the Internet and variable message signs will be compared. Increases in awareness may be due to the increased visibility of these sources as a result of the TTIS deployment or due to other influences.
(Screening Questionnaire) #7 - Did you actually use the telephone information line or an I-40 Internet web site?	#27 - Would you be very likely, somewhat likely, or not likely to use each of the following methods to get road and weather information in Arizona (including a toll-free telephone line, the Internet and a kiosk at a local mall)?	Actual use from the TTIS survey will be compared to stated likely use in the Quality Initiative Survey. Increases in usage may be due to the influence of the TTIS deployment, due to other influences, or due to differences between reported and actual behavior.

[1] Questions have been paraphrased for brevity.
[2] Question numbers refer to the table number in the July 1997 Final Report.

Flagstaff Lodging Industry Impact Study - Part Two: Summer 1997

This study was conducted in 1997 on behalf of the City of Flagstaff and Flagstaff area lodging and tourism interests. A total of 169 overnight visitors to Flagstaff, staying in eight different "mid to upscale" lodging establishments, were surveyed regarding their visit to Flagstaff.

The overall results of the TTIS survey, as well as the subset of surveys collected at Flagstaff area hotels, will be compared with the previous Flagstaff lodging survey. Some of the specific comparisons that may be made between the TTIS survey and the Flagstaff lodging survey are shown in Table 4.

Table 4. Potential Comparisons Between TTIS Survey and Flagstaff Lodging Survey

TTIS Survey Question [1]	Flagstaff Lodging Survey Question [1]	Analysis Logic
(Screening Questionnaire) #7 - Before you left on your trip, did you use a toll free phone number or the Internet to plan the trip? #36 - Did you use any of these other sources of information (maps, asked directions at the hotel, travel organizations like AAA, stopped to ask directions, other)?	#10 - Did you obtain information about Flagstaff before you arrived? #11 - If yes, how did you obtain this information?	The percentage of people using various information sources, including the Internet, will be compared. Increases in usage may be due to the increased availability of information through the TTIS or due to general increases in the use of a particular tool for travel planning.

[1] Questions have been paraphrased for brevity.

Arizona Office of Tourism Arizona Welcome Center Study

The Arizona Office of Tourism conducted a study of visitors to the Painted Cliffs Welcome Center, located along I-40 near the New Mexico Border. A kiosk is being deployed at this same location as part of the TTIS. A total of 1,059 travel parties that stopped at the Welcome Center completed a one-page survey and were given a travel diary to complete and return. In addition, 321 surveys were conducted at other locations along I-40, including one location where TTIS surveying is planned: the Petrified Forest National Park. Table 5 presents some of the comparisons that may be made between the TTIS and Welcome Center surveys.

2.2.2 DPS Information Calls

The number of calls related to requests for travel condition information that are received by the Department of Public Safety in Flagstaff during the I-40 TTIS deployment will be compared to the historic number of calls for the same months in previous years. The results of this comparison will be augmented by a tabulation of the number of calls made to the Voice Remote Access System, the TTIS telephone hotline for traffic conditions, during the same period. A significant decrease in the number of calls fielded by the DPS accompanied by a relatively high volume of calls to the TTIS telephone line requesting information on Northern Arizona routes would suggest that the TTIS has been successful in diverting calls that would otherwise be made to the DPS. The quantitative data on the number of DPS calls will be complimented, if possible, with anecdotal information from DPS staff.

Table 5. Potential Comparisons Between TTIS Survey and
Arizona Welcome Center Survey

TTIS Survey Question [1]	Welcome Center Survey Question [1][2]	Analysis Logic
(Screening Questionnaire) #7 - Before you left on your trip, did you use a toll free phone number or the Internet to plan the trip? #36 - Did you use any of these other sources of information (maps, asked directions at the hotel, travel organizations like AAA, stopped to ask directions, other)?	#14 - What Information sources did you use to plan your trip? (Asked of Welcome Center visitors) #30 - What information sources did you use to plan your trip? (Asked of I-40 travelers who did not stop at the Welcome Center).	The percentage of people using various information sources, including the Internet, maps, travel clubs and asking directions, will be compared. Increases in usage may be due to the increased availability of information through the TTIS or due to other influences on the use of specific information sources for travel planning.
#4, #13, #22 & #31 (asked for each device--kiosk, Internet site, telephone, variable message sign) - How strongly do you agree or disagree with the statement "the information saved you time"? #7, #16, #25 & #34 (asked for each device--kiosk, Internet site, telephone, variable message sign) - how strongly do you agree or disagree with the statement "I changed routes or plans in some way as a result of getting the information"?	#21 - How did you use the information you received from the Welcome Center? (Influenced places visited, increased length of stay, spent extra money, plan to use for future trip)	The influence of the individual TTIS devices, and for the four TTIS devices as a group, can be compared to the use of Welcome Center information. Differences in usage may be due to increased attractiveness of TTIS information (including the kiosk planned for the Welcome Center in question) or due to general changes in the use of travel information.
#41 - How strongly do you agree or disagree with the statement "the highways I used to get here to Northern Arizona were safe"? #42 - How strongly do you agree or disagree with the statement "Overall, I am pleased with travel conditions on this trip (such as traffic, safe conditions, clear routes, etc.)"?	#31 - How satisfied were you with various aspects of your Arizona vacation (including "highways")?	Satisfaction with travel conditions will be compared. Direct comparisons are hindered by the fact that the Welcome Center survey question about highways may not be, depending upon how broadly respondents chose to interpret the word "highways," directly compara-ble to the TTIS survey question related to overall travel conditions. Differences in perceptions regarding "highways" and "travel conditions" may be due to the influence of the TTIS or due to other influences.

[1]   Questions have been paraphrased for brevity.
[2]   Question numbers refer to the table number in the June 1996 Final Report.

3.0 SCHEDULE

Table 6 presents the anticipated schedule for the completion of all activities related to this test.

Table 6.   Anticipated Schedule for Test

Activity	1998									1999			
	A	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**
Pre-Test Activities (design)	X	X											
Test Activities (data collection)			X	X	X	X	X	X	X	X			
Post-Test Activities							X				X		
Analysis and Reporting								X				X	X

4.0 PRE-TEST ACTIVITIES

Most of what will be done prior to the June 1, 1998 evaluation period start has already been done as part of the development of this Test Plan, including collection and review of previous survey results, example HCRS system inputs matrix and example system outputs data (e.g., VMS logs, Internet "hits", etc.). Between the acceptance of this Test Plan and the start of the evaluation, historical DPS information call data will be collected and necessary analysis tools, such as spreadsheets, will be developed.

5.0 Test Activities

During the evaluation test period, from June 1, 1998 through January 31, 1999, information on system inputs (the HCRS input matrix) and outputs will be collected on a monthly basis and input into spread-sheets or other analysis tools. Flagstaff Department of Public Safety recording of the number of travel condition information calls will be monitored on a monthly basis. Anecdotal information regarding the use of ADOT maintenance laptops for inputting data into the HCRS database, and the perceptions of HCRS client workstation agencies will be collected throughout the test during whatever opportunities present themselves. Data on PrePass transponder utilization will be collected on a monthly basis over the course of the evaluation period.

6.0 Post-Test Activities

The data through September 1998 will be organized into a database. The analysis of the data will be performed and the results will be documented in the November 1998 Summary of Preliminary Results Report. Data from October 1998 through January 1999 will be analyzed in conjunction with the June–September data and results for the entire June 1998 - January 1999 period will be presented in the April 1999 Final Evaluation Report.

7.0 REPORT FORMAT

The results of this test will be summarized in a technical report. The Report will contain the following sections:

1.0   Executive Summary
2.0   Introduction and Background
3.0   Summary of the Approach
4.0   Results
5.0   Conclusions
6.0   Recommendations for Future Analysis

8.0 ESTIMATED RESOURCES

Table 7 presents the required allocation of hours for personnel to conduct the test.

Table 7.   Estimated Allocation of Project Staff Hours (person hours)

Staff	Task				
	Pre-Test Activities	Test Activities	Post-Test Activities	Analysis and Reporting	Total
Task Manager and Evaluation Leader	0	0	0	2	2
On-Site Evaluator	10	12	6	16	44
Statistician	0	0	0	8	8
ATIS Specialist	0	0	0	2	2
ADOT Local Evaluator [1]	2	8	0	0	10
Support/Administrative	0	0	0	4	4
Total	12	20	6	32	70

[1]   The ADOT Local Evaluator will be responsible for collecting Department of Public Safety data on the volume of travel information telephone calls (review of documents is also assumed but is considered an overall project responsibility and has not been broken out for this Test Plan).