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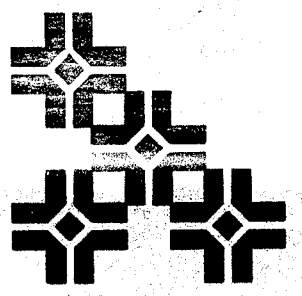
Advanced Technology for Transit Passenger Information Delivery Systems



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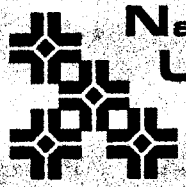

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Advanced Technology for Transit Passenger Information Delivery Systems

Dr. Charles Hofacker and William A. Mustard
Principal Investigators

A research project of...

NUTI -- the National Urban Transit Institute
and
FTA -- Federal Transit Administration

Conducted by...
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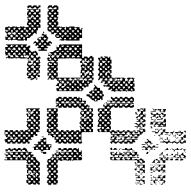

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16. Abstract

This project was conducted during the period 1997 to 1999 to determine the most promising uses of new technology for delivering transit passenger information. The project was based on the premise that in order for transit to be more competitive with the automobile, transit passengers and potential transit passengers must have access to transit information and accessibility that approaches the level of information and access offered by the private automobile. With the advent of new technologies such as the Internet, the project proposed that there may already be an emerging leader in new technologies that could provide this information. The project proposed to survey the existing technologies that are current in use by transit systems, devise a way to compare these technologies, and select the most promising technologies for further study.

Using this methodology, the research team was able to identify the following top three "advanced technologies" for delivering real time transit information to all transit passenger market segments:

1. Interactive Voice Response Systems
2. Personal Digital Assistants
3. World Wide Web

In addition, the research team identified the following top three technologies for delivering background information:

1. World Wide Web
2. Interactive Voice Response Systems
3. Pre-trip kiosks in public buildings

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Executive Summary

This project was conducted during the period 1997 to 1999 to determine the most promising uses of new technology for delivering transit passenger information. The project was based on the premise that in order for transit to be more competitive with the automobile, transit passengers and potential transit passengers must have access to transit information and accessibility that approaches the level of information and access offered by the private automobile. With the advent of new technologies such as the Internet, the project proposed that there may already be an emerging leader in new technologies that could provide this information. The project proposed to survey the existing technologies that are current in use by transit systems, devise a way to compare these technologies, and select the most promising technologies for further study.

After a straightforward literature review and survey of transit systems, the project identified 33 systems using "advanced technologies" (advanced technologies were defined as any system using GPS or ATMS technology to deliver real-time information to passengers, or any systems that could be used to deliver this type technology, e.g., interactive voice-menus on telephone computers.) After collecting these data, the project team created an evaluation system that related each type of technology to the target market for a given transit agency. This evaluation system was reviewed by eight transit marketing/planning professionals from around the United States to "ground truth" the project team's assumptions, and then the system was applied to each of the technologies identified through the earlier survey process.

Using this methodology, the research team was able to identify the following top three "advanced technologies" for delivering real time transit information to all transit passenger market segments:

1. Interactive Voice Response Systems
2. Personal Digital Assistants
3. World Wide Web

In addition, the research team identified the following top three technologies for delivering background information:

1. World Wide Web
2. Interactive Voice Response Systems
3. Pre-trip kiosks in public buildings

These technologies seem to represent the greatest promise at this time for delivering transit passenger information using advanced technology. However, these technologies are evolving quickly, and transit systems wishing to invest in new technologies are advised to use the evaluation system created through this project as one way to determine the best new technologies for use on their particular operations.

This project was conducted as part of the National Urban Transit Institute. The Principal Investigators were Dr. Charles Hofacker, Mr. William Mustard, and Mr. DeWayne Carver, all of whom are part of the Marketing Institute at the Florida State University College of Business.

Table of Contents

National Urban Transit Institute
Advanced Technology for Transit Passenger Information Delivery Systems

The Marketing Institute, Florida State University College of Business

I. Purpose of project

For most of this century, transit has been losing mode share to the automobile. As transit operators strive to offer services in the face of dwindling budgets and declining ridership, they have learned to make use of new technologies for improving the efficiency of their transit systems. Global Positioning Systems, Advanced Traffic Management Systems, and computer technology are allowing transit to be a more productive part of the transportation system by allowing transit operators to keep up with where their buses are and how well the buses are moving through the street system. As personal computers and computer-based information becomes more ubiquitous, transit operators may also have an opportunity to share this information with transit passengers. By giving passengers access to real-time information about the location and progress of transit vehicles, transit operators can decrease the uncertainty-levels typically associated with transit travel. If passengers, or potential passengers, can be as confident of the location and availability of transit as they can be of their personal automobiles, transit may become a more viable transportation option. This project describes the systems that deliver this type of newly-available information as "advanced technology for transit passenger information systems." The project is designed to determine the state of development and near-development of these kinds of systems and evaluate the systems in terms of their market-orientation and feasibility.

II. Project Plan

This project undertook a survey of the existing and planned systems for delivering information to transit passengers via "advanced technology". For the purpose of this project, "advanced technology" was defined as any system using GPS or ATMS technology to deliver real-time information to passengers, or any systems that could be used to deliver this type of information. For example, an interactive phone system could be hooked to a computer to provide real-time data on the transit system, so this type of system would be considered "advanced technology". A printed paper map or booklet, however, cannot make use of real-time data, so it would not be considered "advanced technology." Once the survey of existing systems and planned systems was completed, the project created a set of evaluation criteria for determining the utility of these new systems. These criteria were evaluated by transit industry personnel in a telephone interview. The criteria were then applied to the systems identified in the survey to determine which systems had the greatest utility. Finally the project identified which systems offered the greatest promise for effectively delivery transit passenger information and made recommendations for implementing and supporting these systems.

III. Task One: Literature Review

Using the Internet and library resources from the Federal Transit Administration, Federal Highway Administration, ITS America, and others (noted in the Bibliography), the project

identified transit systems that were using, or had indicated they were planning to use, advanced technology systems. 33 projects were identified; these are listed in Table 1.

Table 1: Advanced Technology Projects From Literature Review

Project Name	Start Year	End Year	Project City	Project State
Automated Passenger Information System -- New Jersey	95	96	Newark	NJ
Portland Smart Bus	90	93	Portland	OR
Seattle Wide Area Information for Travelers	94	97	Seattle	WA
Seattle Smart Traveler			Seattle	WA
Montgomery County (MD) Systems Integration			Montgomery County	MD
Denver, Colorado Rapid Transit District (RTD) Passenger Information System	93	97	Denver	CO
Denver Smart Vehicle			Denver	CO
Intelligent Corridor of the Southeast (ICS)	92	99	Broward and Dade Counties	FL
Florida Motorist Information Network for Guidance and Operations			Dade County	FL
Automated Passenger Information System -- Miami	95	97	Miami	FL
Chicago Smart Intermodal			Chicago	IL
Ann Arbor Smart Intermodal System	91	95	Ann Arbor	MI
Atlanta Traveler Information Showcase	95	96	Atlanta	GA
Atlanta Transit ITS	95	99	Atlanta	GA
Orlando Bus Stop Displays for Passenger Travel Planning	95	96	Orlando	FL
Detroit Transportation Center Transit Information	92	94	Detroit	MI
Smart Project	93	98	Detroit	MI
Alternate Bus Routing	93	Present	Golden State Parkway	NJ
Delaware County (PA) Ridetracking			Delaware County	PA
GENESIS	92	97	Minneapolis/St. Paul	MN
Minnesota Travlink and Genesis			St. Paul	MN
Boston Smart Traveler	92	94	Boston	MA
Yahoo West Orange County Traffic Flow Map			West Orange County	CA
Blacksburg Rural Traveler Information System	96	98	Blacksburg	VA
Northern Virginia Smart Route System			Woodbridge	VA
Houston Smart Commuter			Houston	TX
Orange County Smart Traveler			Orange	CA
New York City Traveler Information System			New York	NY
Tampa Area Traveler Information System			Hillsborough County	FL
Broadcast Area Wide Travel Information			Orlando	FL
California Smart Traveler	93	94	Los Angeles and Orange County	CA
Los Angeles Smart Traveler Kiosks			Los Angeles	CA
Sacramento Rideshare			Sacramento	CA

IV: Task Two (User Survey) Results

After identifying projects that were using advanced technology, the next step was to determine how well these projects were actually working and the extent to which they had been implemented. This was accomplished using a survey that was mailed out to the contact persons for each project. The survey gathered information about the operational characteristics and relative success of the advanced technology systems. Specifically, the surveys determined:

1. Target groups for the project
2. Kinds of information provided
3. Technologies used by the project
4. Integration with ATMS
5. Planned changes to the project

22 of 33 surveys were returned or were completed by telephone interview. The information from these surveys, as well as a copy of the survey document, is contained in Attachment One: User Survey.

V. Task Three (Evaluation Criteria)

After determining the current state of advanced technology development and implementation in Task Three, the project sought to evaluate the utility of this technology, which required the creation of evaluation criteria. Because this project was attempting to determine the market-effectiveness of these technologies, the identification of target markets was considered an important criterion. A second criterion was the type of information being delivered – i.e., whether the information was real-time or not. Transit passengers, according to this line of reasoning, would have different types of information needs, based on the type of passenger in question. Different technologies would meet these needs with different levels of success. Using this approach, the research team created three categories of transit users:

1. **Reliant Riders:** Passengers who use transit because they have no other transportation option
2. **Choice Riders:** Passengers who could use another transportation option, but have chosen transit because of economic or other considerations
3. **General Public:** Passengers who rarely use transit except in situations of temporary lack of transportation, such as automobile failure, travel in another city, or for a special event.

Each of these user categories would have different requirements for real-time transit information, and therefore might find one type of advanced information delivery technology more useful than another type. For the purposes of testing the criteria, the research team used the three most popular forms of advanced information delivery systems from the User Survey. These were interactive telephone menu systems, the Internet/World Wide Web (WWW), and Enroute Kiosks in the transit plaza. The passenger categories and the information delivery systems were arranged in a matrix, and an assessment of "Useful" or "Not Useful" was assigned to each combination of passenger category and delivery system. Table 2 illustrates this arrangement.

Table 2: Criteria Grid

	Interactive Telephone	Enroute Kiosks	WWW
Reliant Riders	[useful] [not useful]	[useful] [not useful]	[useful] [not useful]
Choice Riders	[useful] [not useful]	[useful] [not useful]	[useful] [not useful]
General Public	[useful] [not useful]	[useful] [not useful]	[useful] [not useful]

This grid was used to determine the utility of both real time and non-real-time data. The research team assigned its intuitive scores of "useful" or "not useful" for each technology/passenger type intersection. To "ground truth" this assessment, the team conducted had 8 transit industry representatives evaluate the criteria using a telephone interview process as a peer review activity. This peer review survey is included as **Attachment Two**. The results of this review are summarized in Table 3.

Table 3: Results of Peer Review

Interviewee	Agreement with Real Time Assessment	Agreement with Non-Real Time Assessment	Number of Additional Issues Raised
Name	#	#	#
Tom Spiekerman	6	6	1
Nita Rodriguez	8	7	0
Bob Gibbons	0	8	1
Joe Caruso	0	8	1
Sarah Batten	8	9	1
Bob Ahl	9	9	0
Cynthia Nordt	9	9	0
Marion Darlington	8	8	2

The peer review generally validated the application of the evaluation criteria, but it also revealed an unexpected distrust of real-time transit information delivery systems. This distrust seemed to reveal a lack of commitment to a marketing or customer oriented philosophy. For example, one peer review group stated that real time information would create expectations of service, apparently something to be avoided. Other groups stated flatly that real time information would simply not be useful to transit users, whether delivered over the WWW or via the other two mechanisms.

Similarly, some of the segmentation suggested by the peer review group also implied a lack of a market focus. Instead of categorizing on market differences, product distinctions such as express vs. local, or peak vs. off peak, were often emphasized.

VI. Task Four (Evaluation of Systems from Task 2 using criteria from Task 3)

Having validated the evaluation criteria through peer review, the research team then put each of the systems identified in Task 2 through an evaluation process. The results from this evaluation are listed in Figures 4 and 5. The evaluation instrument and results are contained in **Attachment 3**. Figure 4 indicates the relative utility of each technology for each market segment, in terms of real time and background information delivery. Figure 5 ranks the systems based on their total "utility scores", irrespective of market segment. Figure 5 is also divided into real time and background information delivery systems in recognition that these are two different types of information with different delivery requirements.

Figure 4 : Systems Utility by Market Segment & Type of Information

All Rider Groups -- Ranking of Technology Utility

For each rider group, the information delivery sytems are rank ordered in terms of utility. Background and Realtime utility are listed separately.

Reliant Riders

Background		*Realtime*	
Information Delivery Technology	**Total**	**Information Delivery Technology**	**Total**
Pre-trip kiosks-mall	3	Enroute kiosks-transit plaza	3
Pre-trip kiosks-public building	3	Interactive Voice Response System	3
Enroute kiosks-transit plaza	3	PDA	3
Interactive Voice Response System	3	Pre-trip kiosks-mall	3
PDA	3	Pre-trip kiosks-public building	3
WWW	2	Enroute kiosks-other	2
Pre-trip kiosks-other	2	Interactive Cable	2
Enroute kiosks-other	2	Pre-trip kiosks-other	2
Interactive Cable	2	WWW	2
Fax Back System	1	Fax Back System	1
Variable Highway Message Signs	0	Enroute kiosks-airport	0
Enroute kiosks-airport	0	Enroute kiosks-highway rest areas	0
Enroute kiosks-highway rest areas	0	Variable Highway Message Signs	0

Choice Riders

Background		*Realtime*	
Information Delivery Technology	**Total**	**Information Delivery Technology**	**Total**
WWW	3	WWW	3
Interactive Voice Response System	3	Interactive Voice Response System	3
Fax Back System	3	PDA	3
Pre-trip kiosks-mall	2	Interactive Cable	3
Enroute kiosks-transit plaza	2	Pre-trip kiosks-public building	2
Enroute kiosks-airport	2	Pre-trip kiosks-other	2
Enroute kiosks-other	2	Enroute kiosks-transit plaza	2
Interactive Cable	2	Enroute kiosks-airport	2
Variable Highway Message Signs	1	Enroute kiosks-other	2
Pre-trip kiosks-public building	1	Variable Highway Message Signs	1
Pre-trip kiosks-other	1	Pre-trip kiosks-mall	1
PDA	1	Enroute kiosks-highway rest areas	0
Enroute kiosks-highway rest areas	0	Fax Back System	0

General Public

Background		*Realtime*	
Information Delivery Technology	**Total**	**Information Delivery Technology**	**Total**
WWW	3	Pre-trip kiosks-other	3
Pre-trip kiosks-public building	3	WWW	2
Pre-trip kiosks-other	3	Pre-trip kiosks-public building	2
Enroute kiosks-airport	3	Pre-trip kiosks-mall	2
Interactive Cable	3	PDA	2
Pre-trip kiosks-mall	2	Interactive Voice Response System	2
Enroute kiosks-transit plaza	2	Interactive Cable	2
Enroute kiosks-other	2	Enroute kiosks-transit plaza	2
Interactive Voice Response System	2	Enroute kiosks-other	2
Fax Back System	2	Enroute kiosks-airport	2
Variable Highway Message Signs	1	Variable Highway Message Signs	0
Enroute kiosks-highway rest areas	1	Fax Back System	0
PDA	1	Enroute kiosks-highway rest areas	0

Figure 5: Information Delivery Systems Ranked by Total Utility Score

All Information Systems -- Utility Ranking

Each information delivery system is listed with its total utility score, based on the total score for all 3 rider groups. The systems are ordered by score, with separate listings for Realtime and Background data.

Realtime

Information Delivery Technology	Total
Interactive Voice Response System	8
PDA	8
WWW	7
Pre-trip kiosks-public building	7
Pre-trip kiosks-other	7
Enroute kiosks-transit plaza	7
Interactive Cable	7
Pre-trip kiosks-mall	6
Enroute kiosks-other	6
Enroute kiosks-airport	4
Variable Highway Message Signs	1
Fax Back System	1
Enroute kiosks-highway rest areas	0

Back Ground

Information Delivery Technology	Total
WWW	8
Interactive Voice Response System	8
Pre-trip kiosks-public building	7
Enroute kiosks-transit plaza	7
Pre-trip kiosks-mall	6
Pre-trip kiosks-other	6
Enroute kiosks-other	6
Interactive Cable	6
Enroute kiosks-airport	5
Fax Back System	5
PDA	3
Variable Highway Message Signs	2
Enroute kiosks-highway rest areas	1

VII. Recommendations and Findings

The top three information delivery systems identified in Task Four for delivering real time information to *all market segments* were:

1. Interactive Voice Response
2. Personal Digital Assistants (PDA)
3. World Wide Web (WWW)

For the delivery of background information such as fares, routes and schedules, and "static" information, the following top three information delivery systems were selected:

1. World Wide Web
2. Interactive Voice Response Systems
3. Pre-trip kiosks in public buildings

These rankings do not tell the entire story, however. There are two additional points to consider when evaluating the relative utility of these systems. First, the WWW provides an information delivery "standard" that almost all of the information delivery systems can be designed to incorporate. This is described further under "Findings", below, but it cannot be emphasized enough. Any information delivery system, especially a real-time system, whether IVR, PDA, or kiosk-based, must be designed with the connection to the WWW in mind. The second point to consider in evaluating the utility of these systems is that the rankings above aggregate the market segments that were identified in Task 3. Without a clear understanding of the market segment for which transit information is intended, one runs the risk of implementing an expensive transit information delivery system that will never be used because it does not meet the needs of one's customers. For this reason, Table 4 rather than Table 5 may be more useful to transit systems, even though Table 4 is a bit more complicated. Table 4 ranks the information delivery systems by market segment; Table 5 does not. The importance and relative lack of understanding of marketing principles to transit systems is also discussed at greater length under "Findings", below, and also cannot be emphasized enough.

Findings

Based on the peer review survey and literature review, the research team has identified the following three concerns relating to the use of advanced technology for transit passenger information delivery systems:

1. **Need for connectivity between information systems:** All of the information delivery systems that were identified can be designed to access computer information with existing technology. This implies that an information "standard" that is appropriate for the personal computer would also be an effective information organizational medium for transit information delivery. The World Wide Web is emerging as the ideal standard. Kiosks, for instance, can easily be linked to the WWW, as can PDA's, IVR systems, and interactive cable. Based on this finding, the WWW should be considered the standard medium of delivery for any passenger transit information system.
2. **Possible misdirection of transit marketing focus:** The peer review survey indicated that while 6 out of 8 respondents saw a distinction between reliant riders and choice riders, 5 out of 8 respondents saw no distinction between the information needs of these two groups. From a marketing perspective, this could indicate that transit systems may be unclear as to the best way to determine the information needs of their users.

Incidentally, 7 of the 8 respondents did see a distinction between the needs of visitors and the needs of local transit users, which would indicate that these respondents do make a distinction between some market segments.

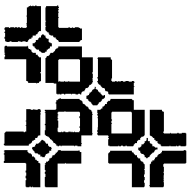
3. **Need to educate transit operators on state of technology:** The peer review group had a clear understanding of the use of kiosks and the WWW as information delivery systems, although there was disagreement on the wisdom of providing real time information through these or any other information delivery system. Interactive Voice Response, however, was consistently misunderstood as an information delivery system. The peer review group tended to consider any voice mail tree, or even a live operator, as an IVR system. In fact, IVR refers to systems that allow callers to interact with a computer via use of the telephone, with no other human assistance, in order to get information from and/or add information to the computer system. IVR systems are widely used by banks, credit card companies, and universities to perform transactions, check information, or register for classes or services. Based on the peer review, it is likely that transit systems do not understand the potential of IVR systems to serve the needs of their passengers.

Recommendations for Future Research: Information delivery technology is changing and advancing rapidly, and may continue to do so for some time. The use of information delivery via Personal Digital Assistants, for instance, was relatively rare at the time this project was conducted, due to the fact that PDA's were not widely used at that time. In the past year, however, the handheld-computer market has increased considerably, and will continue to do so for the next few years as cellular, GPS, and paging technologies are incorporated into these tiny computers. These computers are replacing PDA's, and may very well be as common as pagers and cellular phones within a few years. Therefore, even though this type of information delivery system did not score very highly in the evaluation criteria, it is probably worth continued scrutiny. Bearing that in mind, future research could usefully focus on the top technologies listed in this report, as well as PDA information delivery, and look for better ways to educate transit operators regarding these technologies.

ATTACHMENTS

1. **User Survey:** Contains copy of survey instrument and tally of survey results
2. **Peer Review Survey:** Contains copy of peer review instrument and webpage instrument.
3. **Evaluation Survey:** Contains copy of survey instrument and tally of results
4. **Bibliography**

ATTACHMENT 1 -- USER SURVEY



National Urban Transit Institute

The Marketing Institute at
the Florida State University College of Business
Tallahassee FL 32306-1111
(850) 644-2509

July 8, 1997

«Identifier» «Local_Contact_First_Name» «Local_Contact_Last_Name»
«Title»
«Company»
«Mailing_Address»
«City_State_Zip_Code»

Dear «Identifier» «Local_Contact_Last_Name»:

Your agency has been identified as a current or past user of advanced technologies for delivering transit information. We are currently conducting research on the use of these technologies, and we would like to get some information from you regarding your program. This research is being conducted by the Marketing Institute at Florida State University, under contract with the National Urban Transit Institute at the University of South Florida. The information you provide will be used to evaluate the suitability of different technologies (such as the Internet, GPS and real-time data transmission, interactive cable, and kiosk systems) for delivering transit information in a variety of different settings. In exchange for your assistance, we will provide you with a copy of the completed study.

The enclosed survey will take approximately 5 to 10 minutes to complete. A researcher from our office will call you within the next few weeks to arrange a time to conduct the survey over the telephone with you, or you can complete the survey on your own and mail it back to the us in the enclosed envelope. The survey should be returned by August 15, 1997.

Thank you for you assistance in conducting this research. Your input will help us find even better ways to use, fund, and support the use of advanced technologies for transit information delivery. Please call me at (850) 644-2509 if you have any questions about the survey or this research project. Your comments and input are greatly appreciated.

Sincerely,

Dewayne Carver
Assistant Director, The Marketing Institute

New Technology for Interactive Transit-User Information Systems

Survey of Existing Programs

(please complete and return by Friday, August 15, 1997)

Prepared by:
The Marketing Institute
Florida State University College of Business
Tallahassee, FL 32306-1111

July 1997

A research project for the ...

National Urban Transit Institute

Project Identification

This portion of the survey collects basic information about the person in charge of this project. Please correct any inaccurate information and fill in any missing information....

Your Name/Project Administrator: «Identifier» «Local_Contact_First_Name» «Local_Contact_Last_Name» «Title»

Company or Agency: «Company»

Address «Mailing_Address» «City_State_Zip_Code»

Phone «Phone_Number»

Fax «Fax_Number»

Email «Email»

Web Page: «Web_Page»

Title of Project or Information Delivery System: «Project_Name»

Total funding of project: «Funding»

Project Beginning Date: «Start_Month», «Start_Year»

Project Ending Date: «End_Month», «End_Year»

Operational Characteristics

1. **Please indicate the primary group(s) to whom this program is targeted (check all that apply):**

   _ Enroute transit users
   _ Pre-trip transit users
   _ Enroute auto commuters
   _ Pre-trip auto commuters
   _ General public
   _ Tourists
   _ Transit Provider/Operator
   _ Other _____

2. **Please indicate the kinds of information that this program provides (check all that apply):**

- _ General transit information (how to ride the bus, fares, etc.)
- _ Transit routes and schedules
- _ Real-time transit route information (what buses are early, late, on time, etc.)
- _ General traffic information (construction areas, scheduled delays, etc.)
- _ Real-time traffic information (check all that apply)
- _ Accidents
- _ traffic speeds
- _ other _____

3. **Please indicate which of the following technologies are used by this program to deliver information (check all that apply):**

- _ World Wide Web/Internet
- _ Pre-Trip Kiosks

  Types of Locations:
  - _ Shopping malls
  - _ Public buildings such as libraries, city hall, etc.
  - _ Other _____
- _ Enroute Kiosks

  Types of Locations:
  - _ Transit Plazas or centers
  - _ Airports or other intermodal facilities
  - _ Highway rest areas
  - _ Other _____
- _ Telephone menu system
- _ Fax Back System
- _ Personal Digital Assitant broadcast
- _ Interactive Cable TV
- _ Other technology (please describe below; attach additional description if necessary)

_____

_____

PLEASE GO TO THE NEXT PAGE

4. **Does this program tie into any other intelligent transportation infrastructure systems (traffic signals, remote sensing, etc.)?**

Please circle one : Yes or No

If yes, please explain how the system is tied in:

_____

_____

_____

_____

Program Evaluation

5. **How well has the program accomplished its purpose as described in the questions above?**

Please circle one: Above expectations Met expectations Below expectations

6. **Do you foresee any changes, modifications, or expansion of this program in the future?**

Please circle one: Yes or No

If yes, please describe the changes, modifications, or expansion (attach additional pages if necessary):

_____

_____

_____

_____

7. **Do you plan to implement any other advance information delivery systems for transit users in the near future?**

Please circle one: Yes or No

If yes, please describe the systems that could be implemented (attach additional pages if necessary):

Thank you for participating in this survey. If you have any additional information about your program, please send it to us along with your survey. Please return this survey by August 15, 1997. Call DeWayne Carver at (850) 644-2509 if you have any questions.

ATTACHMENT 2: PEER REVIEW SURVEY

Advanced Technology for Transit Information Delivery
Peer Review Interview Questions

Interviewer:

Interviewee Name:

Position:

Company:

Date:

1.) If you were going to divide transit users into groups, how would you do so?

2.) Do you see a distinction between those who take transit by choice (choice riders) and those who use it out of economic necessity (reliant riders)? Yes No

3.) Is this a key distinction? Yes No

4.) How and when do these groups use transit? Commuting, traveling, daily, occasionally, etc.

Reliant commute travel daily v. occasional other_____

Choice commute travel daily v. occasional other_____

5.) How do the information needs of these two groups differ?

6.) Is there an important distinction between the needs of visitors and the needs of local transit users? Yes No

(If no, go to Question 9)

7.) If yes, what sorts of information do the visitors need that local users do not?

8.) How and when do these groups use transit? Visitors:

Locals:

9.) We have named one group of transit users "the general public." By this we mean folks who rarely if ever actually use transit. They might use it if they had a mechanical problem with their car, or while traveling.
Does this group have distinct information needs from normal users and choice users?

10.) We have found that there are three technologically advanced methods of delivering transit information: interactive phone service, kiosks and the Internet. Would you agree that any of these delivery schemes might have value? Yes No

If yes, which ones?

11.) Can you think of any others that we should include?

12.) Is there a difference between how real time location information should be delivered versus how background information about routes and schedules should be delivered?

13.) We see the delivery of transit information as being part of a grid or a table. Along the top of the grid are the 3 types of delivery system: Interactive Voice Response, Kiosks, and the WWW. Down the left side of the grid are our three transit user types: reliant users, choice users, and the general public. Within this grid, users can receive two types of information: Background and Real-time.

Does the idea of this grid make sense to you?

(a copy of this grid is available on the World Wide Web at http://tmi.cob.fsu.edu/tmi/nutitech.htm.)

14.) Please comment on how useful each delivery system would be for each combination of market segment and delivery method for both real time information and background information.

	IVR	**Kiosk**	**WWW**
Reliant Riders	1 - Background, Real	2 - Background, Real	3 - Background, Real
Choice Riders	4 - Background, Real	5 - Background, Real	6 - Background, Real
General Public	7 - Background, Real	8 - Background, Real	9 - Background, Real

14.) Please comment on how useful each delivery system would be for each combination of market segment and delivery method for both real time information and background information.

	IVR	**Kiosk**	**WWW**
Reliant Riders	1 - Background, Real	2 - Background, Real	3 - Background, Real
Choice Riders	4 - Background, Real	5 - Background, Real	6 - Background, Real
General Public	7 - Background, Real	8 - Background, Real	9 - Background, Real

15.) For each combination of user group and delivery method, comment on our evaluations below.

Our comments indicate whether the information delivery system is useful, useful in specified circumstances, or not useful for each user group.

Background Information Delivery

	IVR	**Kiosk**	**WWW**
Reliant Riders	Possibly useful for simple street layouts	Useful at transfer points or at common destinations like shopping malls	Not Useful
Choice Riders	Possibly useful for simple street layouts	Useful at transfer points or at common destinations like shopping malls	Useful
General Public	Not useful	Useful	Useful

Real Time Information Delivery

	IVR	**Kiosk**	**WWW**
Transit Riders	Useful	Useful at destinations like malls	Not useful.
Choice Riders	Useful	Not Useful	Useful
General Public	Not Useful	Not Useful	Not Useful

Thank you for participating in our project. We will send you a final report on this project about six months. If you have any questions about the project or this interview, please contact **[your name] or DeWayne Carver, the Project Manager, at (850) 644-2509**. Thank you again for your help!

ATTACHMENT 3: EVALUATION SURVEY

NUTI Technology Task 4 Survey

This survey is designed to evaluate the utility of the transit information delivery technologies identified in the Task 2 of the project, using the criteria created in Task 3.

Please indicate, for each transit information delivery technology listed across the top of the page, whether the technology would be "useful" or "not useful" for each of the 3 transit passenger market categories -- transit reliant riders, transit choice riders, and the general public. Do this once for Background information (such as routes and schedules) and once for real time information (such as route delays, time-to-next bus, etc.) for each technology. When finished, return the survey to DeWayne Carver, the Marketing Institute, MC 1111, 321 RBB.

Remember that the transit passenger market categories are defined as follows:

reliant riders:	transit is only means of transportation
choice riders:	commuters with option of using transit or driving
general public:	may occasionally use transit, if visiting or if car breaks down.

	Variable Highway Message Signs	WWW	Pre-trip kiosks-mall
Background Information Delivery			
Reliant Riders	useful not useful	useful not useful	useful not useful
Choice Riders	useful not useful	useful not useful	useful not useful
General Public	useful not useful	useful not useful	useful not useful
Real Time Information Delivery			
Reliant Riders	useful not useful	useful not useful	useful not useful
Choice Riders	useful not useful	useful not useful	useful not useful
General Public	useful not useful	useful not useful	useful not useful

	Pre-trip kiosks-public building	Pre-trip kiosks-other	Enroute kiosks-transit plaza
Background Information Delivery			
Reliant Riders	useful not useful	useful not useful	useful not useful
Choice Riders	useful not useful	useful not useful	useful not useful
General Public	useful not useful	useful not useful	useful not useful
Real Time Information Delivery			
Reliant Riders	useful not useful	useful not useful	useful not useful
Choice Riders	useful not useful	useful not useful	useful not useful
General Public	useful not useful	useful not useful	useful not useful

	Enroute kiosks-airport	Enroute kiosks-highway rest areas	Enroute kiosks-other
Background Information Delivery			
Reliant Riders	useful not useful	useful not useful	useful not useful
Choice Riders	useful not useful	useful not useful	useful not useful
General Public	useful not useful	useful not useful	useful not useful
Real Time Information Delivery			
Reliant Riders	useful not useful	useful not useful	useful not useful
Choice Riders	useful not useful	useful not useful	useful not useful
General Public	useful not useful	useful not useful	useful not useful

	Interactive Voice Response System	Fax Back System	PDA
Background Information Delivery			
Reliant Riders	useful not useful	useful not useful	useful not useful
Choice Riders	useful not useful	useful not useful	useful not useful
General Public	useful not useful	useful not useful	useful not useful
Real Time Information Delivery			
Reliant Riders	useful not useful	useful not useful	useful not useful
Choice Riders	useful not useful	useful not useful	useful not useful
General Public	useful not useful	useful not useful	useful not useful

	Interactive Cable
Background Information Delivery	
Reliant Riders	useful not useful
Choice Riders	useful not useful
General Public	useful not useful
Real Time Information Delivery	
Reliant Riders	useful not useful
Choice Riders	useful not useful
General Public	useful not useful

All Rider Groups -- Ranking of Technology Utility

For each rider group, the information delivery sytems are rank ordered in terms of utility. Background and Realtime utility are listed separately.

Reliant Riders

Background		*Realtime*	
Information Delivery Technology	**Total**	**Information Delivery Technology**	**Total**
Pre-trip kiosks-mall	3	Enroute kiosks-transit plaza	3
Pre-trip kiosks-public building	3	Interactive Voice Response System	3
Enroute kiosks-transit plaza	3	PDA	3
Interactive Voice Response System	3	Pre-trip kiosks-mall	3
PDA	3	Pre-trip kiosks-public building	3
WWW	2	Enroute kiosks-other	2
Pre-trip kiosks-other	2	Interactive Cable	2
Enroute kiosks-other	2	Pre-trip kiosks-other	2
Interactive Cable	2	WWW	2
Fax Back System	1	Fax Back System	1
Variable Highway Message Signs	0	Enroute kiosks-airport	0
Enroute kiosks-airport	0	Enroute kiosks-highway rest areas	0
Enroute kiosks-highway rest areas	0	Variable Highway Message Signs	0

Choice Riders

Background		*Realtime*	
Information Delivery Technology	**Total**	**Information Delivery Technology**	**Total**
WWW	3	WWW	3
Interactive Voice Response System	3	Interactive Voice Response System	3
Fax Back System	3	PDA	3
Pre-trip kiosks-mall	2	Interactive Cable	3
Enroute kiosks-transit plaza	2	Pre-trip kiosks-public building	2
Enroute kiosks-airport	2	Pre-trip kiosks-other	2
Enroute kiosks-other	2	Enroute kiosks-transit plaza	2
Interactive Cable	2	Enroute kiosks-airport	2
Variable Highway Message Signs	1	Enroute kiosks-other	2
Pre-trip kiosks-public building	1	Variable Highway Message Signs	1
Pre-trip kiosks-other	1	Pre-trip kiosks-mall	1
PDA	1	Enroute kiosks-highway rest areas	0
Enroute kiosks-highway rest areas	0	Fax Back System	0

General Public

Background		*Realtime*	
Information Delivery Technology	**Total**	**Information Delivery Technology**	**Total**
WWW	3	Pre-trip kiosks-other	3
Pre-trip kiosks-public building	3	WWW	2
Pre-trip kiosks-other	3	Pre-trip kiosks-public building	2
Enroute kiosks-airport	3	Pre-trip kiosks-mall	2
Interactive Cable	3	PDA	2
Pre-trip kiosks-mall	2	Interactive Voice Response System	2
Enroute kiosks-transit plaza	2	Interactive Cable	2
Enroute kiosks-other	2	Enroute kiosks-transit plaza	2
Interactive Voice Response System	2	Enroute kiosks-other	2
Fax Back System	2	Enroute kiosks-airport	2
Variable Highway Message Signs	1	Variable Highway Message Signs	0
Enroute kiosks-highway rest areas	1	Fax Back System	0
PDA	1	Enroute kiosks-highway rest areas	0

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