

Further Implementation of a Rural ATIS: Observations on the Continued Deployment of YATI.

Kenneth S. Kurani¹

Paul P. Jovanis²

Lourenço Dantas³

1. **Research Engineer**
Institute of Transportation Studies
2027 Academic Surge
University of California, Davis
Davis, CA 95616
Phone: (916) 752-6500
Fax: (916) 752-6572
e-mail: access@foothill.net
2. **Professor, Department of Civil and Environmental Engineering**
Associate Director, Institute of Transportation Studies
2027 Academic Surge
University of California, Davis
Davis, CA 95616
Phone: (916) 752-0247
Fax: (916) 752-6572
e-mail: ppjovanis@ucdavis.edu
3. **Research Assistant**
Institute of Transportation Studies
University of California, Davis
2027 Academic Surge
University of California, Davis
Davis, CA 95616
Phone: (916) 752-2029
Fax: (916) 752-6572
e-mail: lwdantas@ucdavis.edu

ABSTRACT

The Yosemite Area Traveler Information (YATI) system is an advanced traveler information system (ATIS) currently in a field operation test period. In contrast to the majority of ATIS systems which are being implemented in urban and suburban settings, YATI is a rural system. It is designed to improve and enhance travel in a rural environment—but a rural environment subject to episodic and incident related travel restrictions and delays caused by the presence of a hugely popular travel destination (Yosemite National Park), as well as seasonal and incident related delays on, or closures of, the relatively few throughways in the region.

The YATI system was designed with the goals of reducing traffic congestion, improving air quality, enhancing mobility, and preserving and promoting tourism in the region that contains Yosemite National Park and the surrounding National Forests, State Parks, and towns. These goals are to be met by providing real-time information regarding current weather and travel conditions, as well as the status of lodging, public transit, and recreational and camping facilities. Ultimately, the information will be provided by five information channels—changeable message signs (CMS), highway advisory radio (HAR), a traveler advisory telephone system (TATS), a network of electronic kiosks, and a YATI site on the World Wide Web.

We report here on progress in implementing the YATI system since a previous review in 1994. We provide initial conclusions regarding user response to the expanding YATI system, based on preliminary results from data collected during the month of August, 1996 and an additional week-end in October, 1996. Initial comparisons to results from 1994 are presented. Further, while YATI represents an important application of new technological systems, it also represents an important institutional evolution. We make some incipient comments regarding the importance of YATI's institutional development. All our comments here are exploratory in nature as our primary data collection period will only be completed after this paper is sent to press.

INTRODUCTION

The YATI system represents an innovative application of ATIS concepts, technologies and institutions to a rural setting. The towns, roads and highways in the region in and around Yosemite National Park are subject to seasonal traffic congestion, delays and cessation. On major summer holiday weekends, thousands of tourists visit Yosemite National Park, and Yosemite Valley in particular. The three State highways that enter the Park from the west, and the one that enters from the east, are mostly two lane roads. The mix of automobiles, tour buses and recreational vehicles can cause extended lines of slow moving traffic to culminate in even longer queues at the Park entrances. In the winter months, the only trans-Sierra highway in the region, Highway 120, is closed (typically for several months) by winter snows. While an ATIS can do little about the weather, it could address other travel and traffic issues.

If YATI can improve traffic management, that is, if people can be encouraged to take less traveled routes, to change the time of their Park visits, and to diversify their destinations, then YATI may be able to fulfill its stated goals. These goals are to reduce traffic congestion, improve air quality, enhance mobility, and preserve and promote tourism in the region (1, 2). YATI is premised on the hypothesis that improved access to real-time information will cause travelers to make decisions whose net effect is attainment of these four goals. To that end, these four new information technologies have been implemented: changeable message signs (CMS), highway advisory radio (HAR), a network of electronic kiosks, and a YATI site on the World Wide Web. A fifth, a traveler advisory telephone system (TATS), has not yet been implemented.

Technological deployment, system operations, and evaluation are currently funded by the Federal Highway Administration and California Department of Transportation (Caltrans). YATI is currently directed by a Management Board whose members represent local, state and federal agencies including, the local counties, Caltrans and the National Park Service. The Board is advised by a Citizens' and Technical Advisory Committee whose membership includes representatives of the Management Board, in addition to local businesses, environmental groups and the National Forest Service. A non-profit corporation, YATI Inc., has been formed to operate the system. As an ultimate goal, the YATI system is hoped to be self-supporting through sales of advertising space on its WWW site and kiosks, and possibly other revenue sources. A technical sub-contractor is responsible for designing and implementing the YATI components. The Institute of Transportation Studies at the University of California, Davis is responsible for evaluating user response to the system and writing an institutional evaluation.

In this report, we offer initial observations from both the user and institutional evaluations conducted in the summer and autumn of 1996. We make some comparisons to results of YATI user data collected during the 1994 Memorial Day weekend, results of which have previously been reported (3,4). During that time, a system with CMS and HAR was operational, although the signs used were portable and the HAR transmitter locations temporary. The final analysis is still underway, thus our comments are necessarily suggestive of possible outcomes rather than conclusive. Nevertheless, given the paucity of hard evaluation findings concerning rural ATIS, we felt it important to share our findings, even if preliminary.

DATA COLLECTION

Given the greater number and variety of information technologies now in operation, several adjustments and additions were made to the data collection methodology used in 1994. As was done previously, YATI user data is being collected from visitors leaving Yosemite National Park. In 1994 attempts were made to sample both commercial (tour company) and non-commercial traffic. Given very low response rates from travelers on commercial vehicles, no effort was made to sample from this group in 1996. Also, traffic counts and measures of queues at the Park

entrances were made in 1994. For the 1996 evaluation, UC Davis was directed by the YATI Management Board to not collect objective data on traffic levels or entrance delays.

Questionnaires with a self-addressed, postage paid envelope were distributed to visitors leaving Yosemite National Park in a non-commercial vehicle, including cars, vans, light-duty trucks and recreational vehicles; despite the mix of vehicle types, we will refer to this as the “auto visitor” survey. Questionnaires were distributed on each of four weekends in August, 1996—August 3-4, 17-18, 24-25 and Labor Day weekend, August 31-September 2. A final round of surveys was distributed on October 18-19.

In August, 150 questionnaires were distributed at each of the four exits on each day (with the exception of one gate on one day when the Park Service personnel staffing the exit went off duty before all 150 questionnaires were distributed; 124 were distributed at this gate on this particular day.) Thus a total of 5,374 questionnaires were distributed. Of these 1,792 have been returned, for a total response rate of 33%. Though response rates do vary by gate and date, an analysis of variance in which both date and gate are included as one-way effects shows no statistically significant ($\alpha = 0.05$) difference in mean response rates.

Additional user data collection activities in 1996 include interviews of kiosk users and a questionnaire posted on the YATI web site. The kiosk interviews are intercept interviews conducted after people have used a kiosk. Respondents provided feedback on the types of information they were seeking, the usefulness of the kiosk and their response to the design of the interface. The web site survey, since it may be filled out by anyone visiting the YATI web site, not just those who have actually traveled to the Yosemite region, is designed primarily to assess user response to the interface and a comparison of the web site to other information about the region they may have seen.

FINDINGS: LABOR DAY WEEKEND, 1996

In this section we present observations on summary measures of YATI use based on user data from August (including Labor Day weekend) and October, 1996. A total of 1,936 questionnaires were returned; the total response rate was 35%. We make comparisons to results from the 1994 data where applicable. We draw on the kiosk user interviews and other observations where appropriate to suggest possible causes for the observed effects described below. These suggestions can be regarded as initial hypotheses to be tested on the full data set. The percentages of the auto visitor sample who saw or used each of the four YATI components in 1994 and in 1996 are shown in Table 1. These results are discussed in the following sections.

Table One: Percent of Auto Visitors Samples who Saw or Used each YATI Information Service in each Year

	1994	1996
CMS	16%	29%
HAR	19%	12%
WWW page	na	6%
Kiosk	na	5%

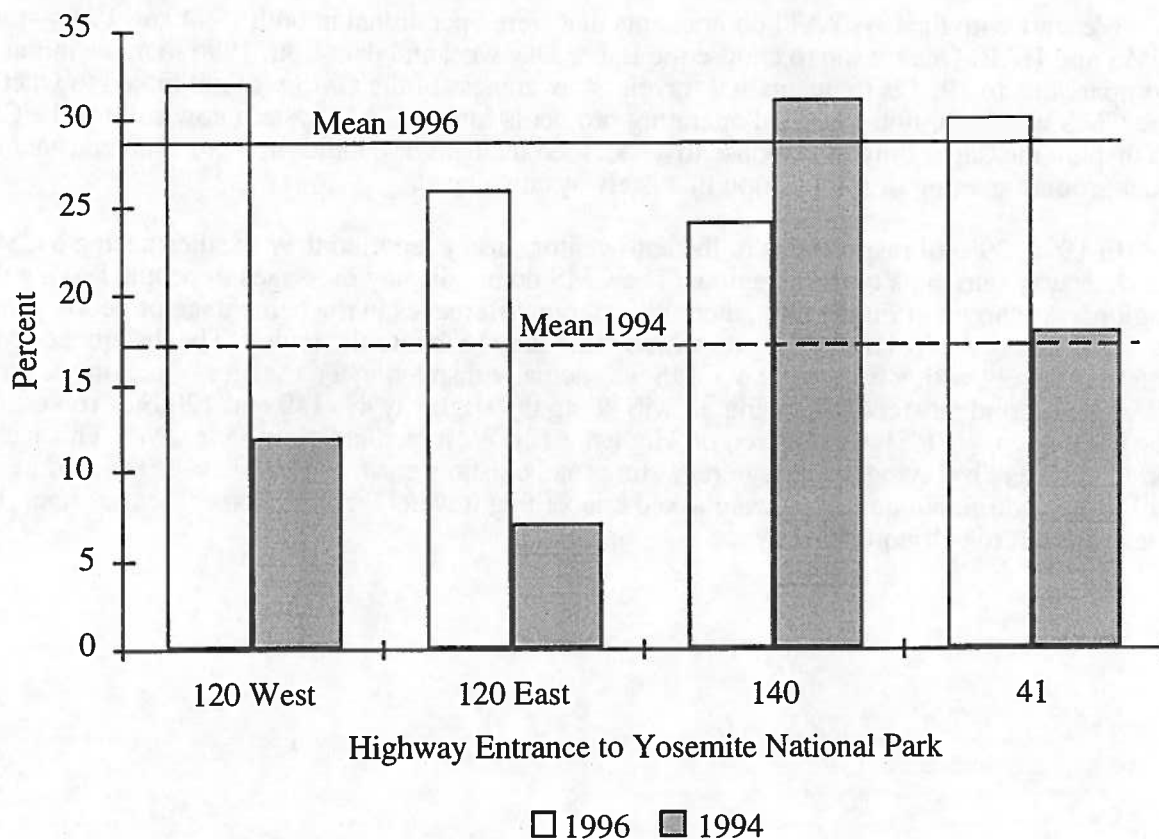
Recognition and Use of YATI: Comparisons of CMS and HAR

CMS

We start with the two YATI components that were operational in both 1994 and 1996—the CMS and HAR. One reason to choose the Labor Day weekend data from 1996 to make initial comparisons to 1994 is to insure that travelers' awareness of the CMS was not linked to whether the CMS was on or not. Standard operating protocols for the YATI system now call for the CMS to display messages only in response to a specified incident or condition; there is no constant or background greeting or information that is always displayed.

In 1996, 29% of respondents to the auto visitor survey reported they recalled seeing a CMS on their way into the Yosemite region. (The CMS do not display messages to people leaving the region). As shown in Figure One, there were large differences in the percentage of people who recalled seeing a CMS depending on which route they took into the region. The differences correlate precisely with whether or not CMS was actually displaying a message. While only 21 to 26% of respondents recalled seeing a CMS along the Highway 41, 140 and 120 East routes, half the respondents (51%) who entered on Highway 120 West recalled seeing the CMS. This particular CMS was displaying a message regarding road closures north of Highway 120 caused by wildfires. Additional questions were asked concerning travelers' recall of specific messages, but these are left to subsequent analyses.

Figure One: Percent of Auto Survey Respondents Who Recalled Seeing a CMS, by Route into Yosemite National Park, 1996 and 1994.



It appears that the illumination of the sign in the Highway 120 approach has greatly increased its visibility to motorists, particularly compared to the signs on the other approaches. These differences are not caused by sight distance restrictions or other site factors as all current sign locations met Caltrans District guidelines for CMS siting. Regional YATI participants were pleased at these results as the sign design and location were influenced in part by a desire to have the signs blend into the landscape when not illuminated: apparently this goal has been met.

As shown in Table One and Figure One, the rate of recognition and recollection of the CMS over Labor Day weekend in 1996 is nearly double that reported for Memorial Day weekend in 1994. Only 17% of all respondents to the 1994 auto visitor survey reported seeing a CMS on their way into the region. Large differences were also noted according to which route respondents took into the region. In that year though, the rate of recognition and recall of a CMS was highest (31.4%) among travelers on Highway 140. The rate of recall on the other three approaches ranged from 7% (Highway 120 East) to 18% (Highway 41).

One explanation for the increased rate of recollection in 1996 is the fact that now the CMS are permanently installed fixtures. During the 1994 time period, the CMS were portable signs and may not have been as readily distinguished from other roadside signs. In 1994 however, the Highway 140 sign was highly conspicuous, placed along side the road along a tangent section of over a mile with open fields on both sides of the road. That temporary sign was very conspicuous, even when not illuminated.

HAR

Twelve percent of all respondents to the 1996 auto visitor survey tuned in the HAR along their route into the Yosemite region. As with the CMS, there are large differences in the rates of HAR use depending on which route was traveled into the region. The highest rate of HAR use was reported along Highway 41 (21%). Between 8% and 12% of travelers along other routes reported tuning in the HAR. (See Figure 2.)

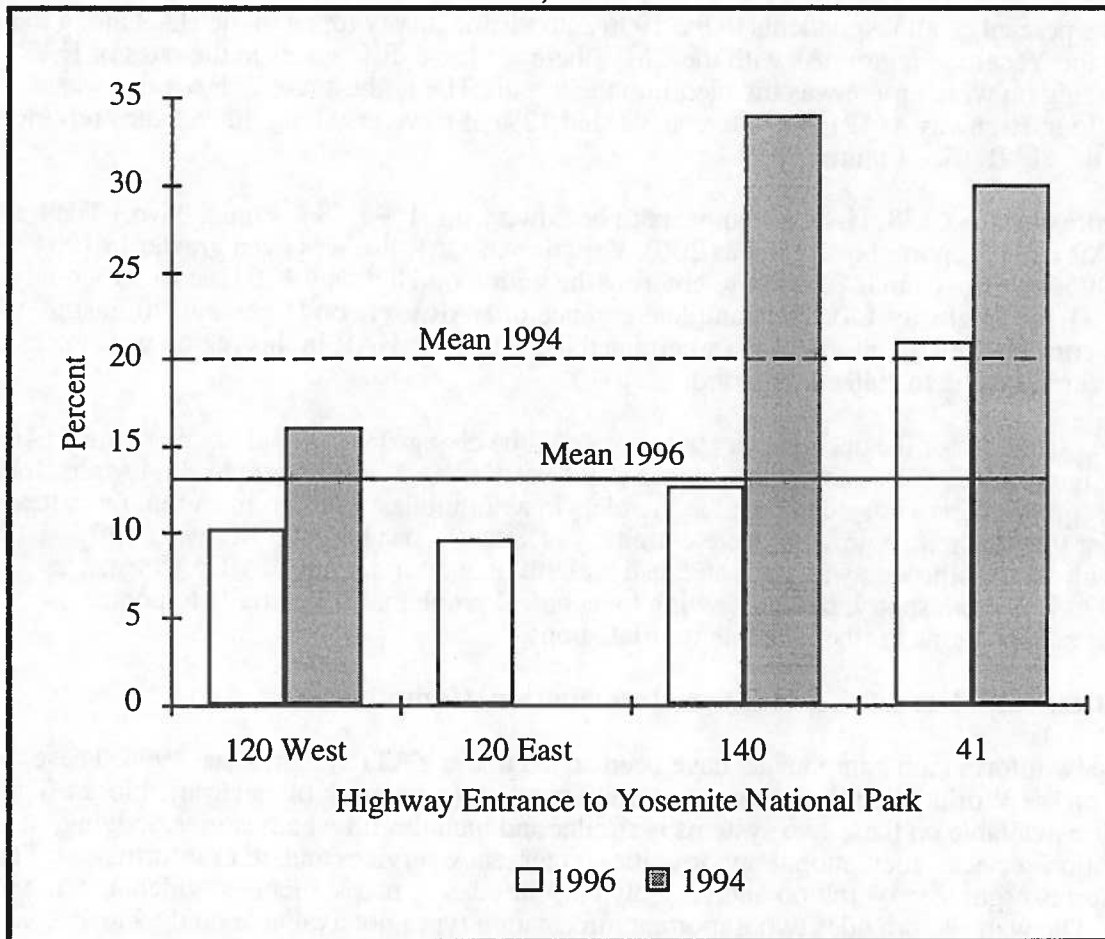
In contrast to the CMS, HAR use appears to be down from 1994. (See Figure Two.) The total rate of HAR use in reported in 1994 was 20%. Variation in HAR use was even greater in 1994 than in 1996, ranging from 0% for those entering the region on Highway 120 East to 30% on Highway 41 and Highway 140. The complete absence of HAR users on Highway 120 East in 1994 was corroborated by information (ascertained later) that the HAR in this region was not operating during the data collection period.

One explanation for the decrease in HAR use could be changes in signs announcing the HARs. The new signs are much less conspicuous than those used in 1994 which were located again along tangent sections clearly conspicuous to the travelers in automobiles. Further, the temporary sites selected for the transmitters in 1994 were extremely advantageous along the Highway 140 and 120 West corridors: transmission was clear and distinct with little interference. HAR performance during 1996 was more spotty, partially owing to technical problems and partially to poorer transmitter site locations for the permanent installations.

Recognition and Use of YATI: New Information Components

Two new information components have been added to the YATI system since 1994. These are a site on the World Wide Web (www.yosemite.com) and a network of electronic kiosks. The information available on these two systems is similar and includes travel advisories, lodging, transportation services, recreational opportunities, emergency services and other information. The information is organized by region and is solely text-based, i.e., maps, pictures, video, etc. are not available. The web site provides two important information types not available on the kiosks—a link to Caltrans' California Highway Information Network web site for information about travel conditions and a link to a weather forecast for the region.

Figure Two: Percent of Auto Survey Respondents Who Tuned in an HAR, by Route into Yosemite National Park, 1996 and 1994.



Despite the overall similarity of the information on both components, the web site and the kiosks probably provide very different services because of the point in travel planning and actual travel at which each is likely to be accessed. Since people will typically access the web site from home, work or school, they are more likely to be looking for information to plan a trip prior to their departure. The kiosks can only be accessed while traveling in the region, and are thus more likely to be used for re-planning in response to some unplanned contingency, to be accessed in response to seeing the kiosk, or to be accessed by people more inclined to take their trips in a less pre-planned manner.

WWW page

Given the relative newness of general public access to the Internet and the World Wide Web, we are surprised to report that 6% of respondents to the auto survey from Labor Day weekend report using the YATI web site. We will be making comparisons of the use of the YATI web site to other information sources in subsequent analyses, but if this result is representative of all Park visitors, then the web site would appear to be a cost effective way of providing pre-trip planning information to a large number of people.

If we have detected any possible bias in our auto visitor sample, it may be that people who responded to the survey are more likely to be connected to the Internet than the general population. In response to the question "Do you have access to the Internet?" 53% of our sample said they did.

We will be making further investigation of Internet access, but there are several reasons to believe that the high level of reported Internet access is real and does not represent a response bias. First, to the extent that most travelers to Yosemite are from California, and to the extent there are a higher number of Internet connections per capita in California than reported nationally (15 to 16%), we expect our sample to report higher incidence of Internet access. Second, as a group, Yosemite travelers are wealthier than the average population and therefore more likely to be able to afford personal Internet access. Lastly, the nature of our question and our sample is more inclusive than some other surveys of Internet access. We are sampling non-commercial vehicles—vehicles that may contain one or more people. If any member of the group has access to the Internet, then that group will likely respond that it has Internet access. So long as we can assume that the group of people who exited the Park together actually traveled together and had some discussion of trip planning together, then our approach is consistent with measuring whether that group did, or could have, accessed the YATI web site.

Electronic Kiosks

Four kiosks are located in visitor information centers or businesses in towns along each of the four highways in the Yosemite region, in the town of Merced (in California's Central Valley) which serves as a major entry point to the region, and a fifth is located in Yosemite Valley. We are surprised by the high rate of kiosk usage—5% of our sample reported they used one or more of the kiosks. Figure Three illustrates data on the use of each kiosk. The use patterns suggest that comparatively few people use any kiosk other than the one located in Yosemite Valley. Of the respondents who reported they had used a kiosk, 77% used the kiosk in Yosemite Valley. This suggests that people are not stopping in the gateway communities to use the kiosks to plan their entry to Yosemite National Park, but once in Yosemite National Park they may be using the kiosks to make plans for their stay in the Valley and Park, and for later portions of their trip.

Technical, Design and Operation Issues

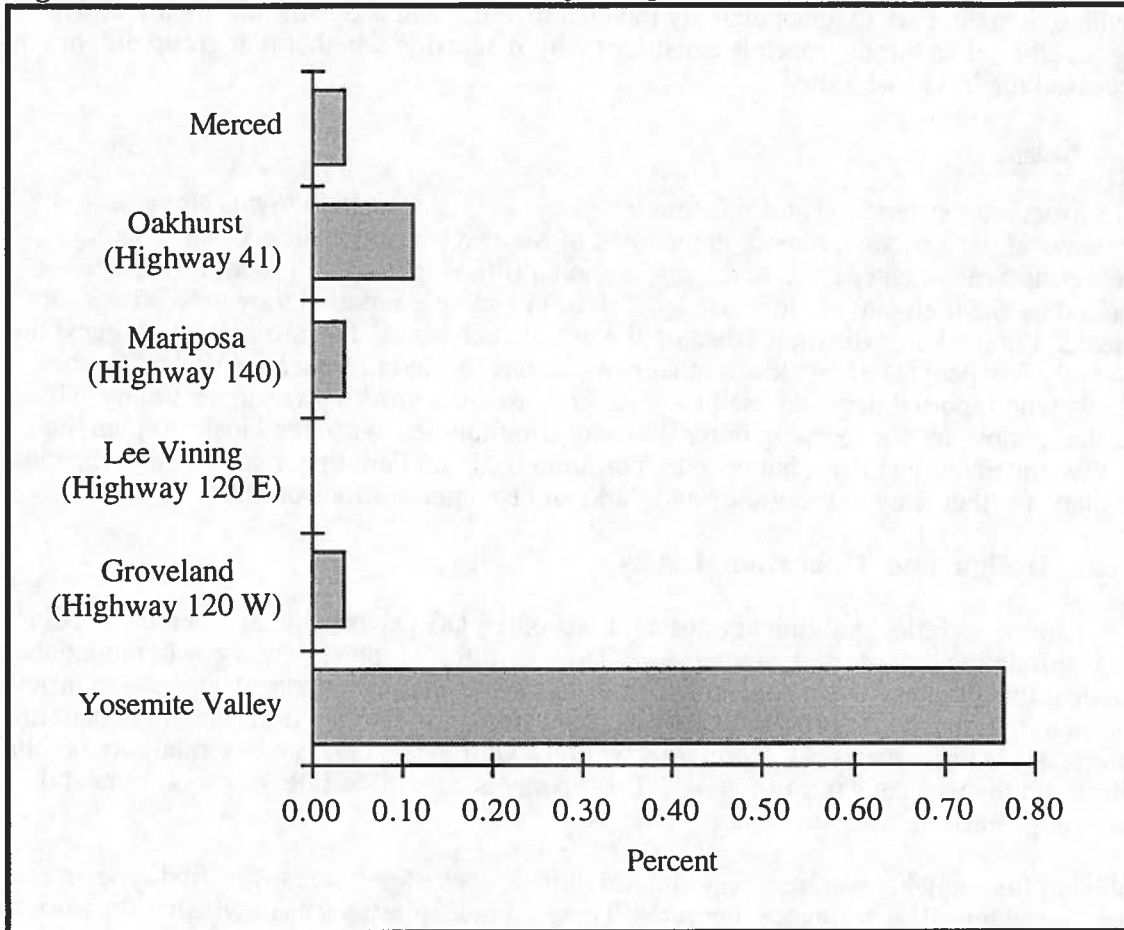
These comments reflect preliminary observations of the UC Davis evaluation team regarding the technical functionality of the Yosemite Area Traveler Information system's key components. By "technical functionality" we mean the extent to which the YATI components operate to provide information to travelers to the Yosemite area. This is assessed separately from the usage patterns of travelers, as we have discussed in previous sections. Comments here are based largely on our travel through the region and our use of YATI components, as well as interviews of users and field personnel (e.g., staff members at visitors centers).

Technical functionality can be assessed through two types of measures. The first type are rather narrow technical performance measures. These include questions as to whether the information delivery systems are in place and functioning as per technical specifications. The second type are broader measures of the system's ability to present accurate and timely information, including the form and content of information presented by the YATI components. Our preliminary sense is that most YATI components are functioning properly in narrow technical terms; the remaining comments focus more on interpretations of how well YATI functions to provide the user with accurate and timely information.

In the broader sense of technical functionality, YATI is still learning to operate a "real-time" information system. Not all operating protocols appear to allow for real time posting of information to the YATI components. The most obvious example is that information to be posted on the CMS and HAR must flow through Caltrans' traffic control center (TCS) in Fresno, CA. The TCS is not staffed on weekends, thus no changes can be posted over the weekend. Moreover, the types of information broadcast over the various components do not, in some cases, provide all the information they might, nor do they exploit the full advantages of the different media. While this may be attributable to growing pains, it may be symptomatic of a more general problem for rural ATIS:

financial resources may be spread so thin, and traffic operational experience so scarce, that it may be very difficult to sustain dedicated 24 hour operations of the type likely needed to provide timely and accurate real-time information. While the technical problems may be overcome through fine tuning of the hardware and software, substantive procedural and staffing changes are likely needed to fully utilize the power of regional rural ATIS. These resources may simply be very hard to come by for rural areas with other historic budget priorities.

Figure Three: Percent of Auto Survey Respondents who Used each Kiosk



One place where these difficulties manifest themselves is the YATI web site. While the web site has functioned flawlessly in a narrow technical sense, and while YATI has implemented a substantially improved web site, on broader measures, YATI Inc. is still working to fulfill its web site's full potential. The World Wide Web is characterized by two key features—nearly instantaneous connections around the globe and the capability for real-time, two-way information flows (versus the one-way information flow of the other YATI systems). This latter feature is indicative of the fact that the Internet and its WWW subset are communication technologies, not strictly mass media technologies. Especially in its first incarnation, the YATI web site did not fully exploit either of these two features. To be fair, this is a common complaint about many web sites. Several features of the YATI web site illustrate this point.

Perhaps the most significant shortcoming in the way in which the YATI web site had been incorporated into the WWW was in the treatment of links to other web sites. From the beginning of the YATI field operation test in June, 1996 (indeed, from its inception months before then) until receiving YATI Management Board approval to actively pursue links to other sites during approval of the web site redesign in December, 1996, the YATI site had been implemented almost solely as an independent, free-standing information source for the greater Yosemite region. Only two links were provided to other parts of the WWW—the California Highway Information Network (CHIN) and to a weather forecast for the region.

Ironically in the case of highway information, this might be the most valuable information that YATI itself should provide, and linking to CHIN instead is inappropriate. The primary limitation of CHIN from the perspective of YATI is that the information available from CHIN is not specific to the Yosemite region. YATI web site users expecting to find roadway information germane to the Yosemite region may in fact find information about road closures and delays occurring hundreds of miles away from Yosemite. This is particularly important in that it seems most plausible that a YATI web site user who is unfamiliar with the region may unnecessarily alter or cancel travel plans because they will assume road closures or delays, posted on CHIN but accessed through YATI, do apply to travel in the Yosemite area.

The original YATI web site did not take full advantage of the “information web” that the WWW represents. Several other web sites exist for this region, many already offering valuable information and services that were not, and still are not, available from the YATI site, but which have been promised. For example, the National Park Service, the Yosemite Association and the Yosemite Fund all have web sites that offer more complete information about the Park itself than does YATI. (We note also that the Yosemite Association’s web site advertises a 900 phone number information service. YATI has had to delay the implementation of its own telephone information system, and is currently negotiating with the Yosemite Association for that organization to provide some telephone advisory information regarding YATI.) Further, the National Park Service web site contains a link to a reservation service for campgrounds in the Park. A few local governments maintain web sites that provide more complete information about lodging, services and events in their area than does YATI. A number of pages exist that provide text descriptions and maps of recreational opportunities in the region. All of this information could be made available to users of the YATI web site simply by linking to these other pages. The newest version of YATI’s web page now contains many more links to these other Yosemite-related web sites.

Institutional Issues

As part of ITS-Davis’ overall evaluation, we are writing an institutional evaluation based on meeting minutes and other records and on interviews with past and current representatives of YATI’s member agencies. It is important to note that YATI has garnered significant regional support and attention. In addition to the members of the Management Board, there are Citizens’ and Technical Advisory Committees of approximately 30 people. The committees meet bi-monthly or more often as necessary and provide guidance and advice to the Management Board.

The interview phase of the institutional evaluation is still underway, but we do offer the following insight from the interviews already completed. Despite the technical, design and operational difficulties noted above, many of the agencies participating in YATI view it as an important institutional success. In particular, representatives of local governments in the region note that YATI serves as the first regional forum in which local, state and federal agencies with jurisdiction over the economy, travel, and the Park can all sit together to discuss problems on a region-wide basis. Prior to YATI, interactions between local governments were more likely to be characterized by suspicion amongst competitors. YATI has provided a forum which fosters a more cooperative and regional approach to the travel and economic problems and opportunities in the region. In this very general sense, YATI has accomplished one of the most touted goals of the

National ITS Program: it has galvanized local, regional state and national interest which, along with the private sector, has resulted in the construction and deployment of a system which truly integrates the region. New transportation initiatives in the region (e.g. the Yosemite Area Transportation Study or YARTS) have been greatly facilitated by the YATI ITS initiative (5).

PORTENTS OF THINGS TO COME

As we complete data collection and entry, we expect to provide more detailed explanations for some of the preliminary conclusions presented here. We will have greater opportunity to observe differences in recall of the CMS based on whether the signs are actually displaying a message or not. We will be providing greater insight into the accuracy of travelers recall of the information that the CMS and HAR display and measures of whether and how such information affected their travel. In addition to an improved description of who used the YATI web site, we will offer comparisons of the web site to other pre-trip information sources. In addition to greater insight into the impact of any one YATI component, we expect to develop a picture of the possible affects of the integrated effects of multiple components. That is, how many travelers saw our used more than one YATI information source?

One of the conclusions from the 1994 study was that information from YATI only rarely caused a change of travel plans, but quite often lead to an improved perception of the trip. For example, informing travelers of delays ahead rarely caused a change of travel plans, but travelers seem to appreciate being told to except delays. We will be studying the 1996 data to see what effects YATI had on travel plans and trip perceptions.

Through such analyses we hope to provide answers to the questions of whether YATI is meeting its goals of reducing (perceived) traffic congestion, enhancing mobility and preserving and promoting tourism. Whether our preliminary conclusions are confirmed or modified, we can conclude that as a supplementary information system, YATI has drawn favorable reviews from many users. While YATI has suffered delays, those setbacks offer lessons for further development. And despite its growing pains, the institutions that have grown out of YATI have facilitated a new regional perspective for planning and implementing new economic and transportation-related programs.

ACKNOWLEDGMENTS

This work is being carried out for the YATI Management Board and Citizens' and Technical Advisory Committee and the California Department of Transportation (Caltrans). The authors wish to thank the following for their assistance: Jesse Brown and Marjie Kirn of the Merced County Association of Governments; Bill Delaney, Michael Osborne and Scott Gediman of the National Park Service. We would also like to thank Sean Co, Shaminder Dhillon, Marta Gezahegn, Michelle Johnson, Kelley Klaver, Raghu Kowshik, Dave Lounsbury, Michelle Maddaus, Ravi Narayanan, Brad Newlin, Aram Stein, Lauren Stein, Tom Turrentine, Shelly Uwayne and Erich Walker for their assistance in collecting the user data. Thanks also to Tom Turrentine for his work on the institutional evaluation. Finally, we would like to thank Shirley Long, Susie O'Bryant and Rosanne Serrao of the ITS-Davis staff for their invaluable support.

ENDNOTES

1. John Gard and Paul P. Jovanis, "Evaluation Plan for the Yosemite Area Traveler Information (YATI) System", UCD-ITS-RR-95-9, Institute of transportation Studies, University of California, Davis, CA., 1995

2. Paul P. Jovanis, Ken Kurani and Raghu Kowshik, "Post Implementation Evaluation plan for the Yosemite Area Traveler Information (YATI) System, Institute of transportation Studies, University of California, Davis, CA., 1996

3. John Gard and Paul P. Jovanis, "Implementation of a Rural ATIS: Initial Findings from the YATI System", Proceedings of the 1995 Annual Meeting of ITS America, Washington, D.C. pp.639-45, 1995.

4. John Gard and Paul P. Jovanis, "YATI System Evaluation: Initial Findings of Travel Conditions Before System Implementation," Institute of Transportation Studies Research Report, UCD-ITS-RR-94-14, University of California, Davis: Davis, CA., July 1994.

5. Mohsen Zarean, E.N. Williams, F.T. Stock, D.L. Warren, "Rural ATIS: A Vision for Development", Intelligent Transportation: Realizing the Benefits, Proceedings of 1996 Meeting of ITS America, Houston Texas, pp. 46-57, 1996.

Table One: Percent of Auto Visitors Samples who Saw or Used each YATI Information Service in each Year

	1994	1996
CMS	16%	29%
HAR	19%	12%
WWW page	na	6%
Kiosk	na	5%

Figure One: Percent of Auto Survey Respondents Who Recalled Seeing a CMS, by Route into Yosemite National Park, 1996 and 1994.

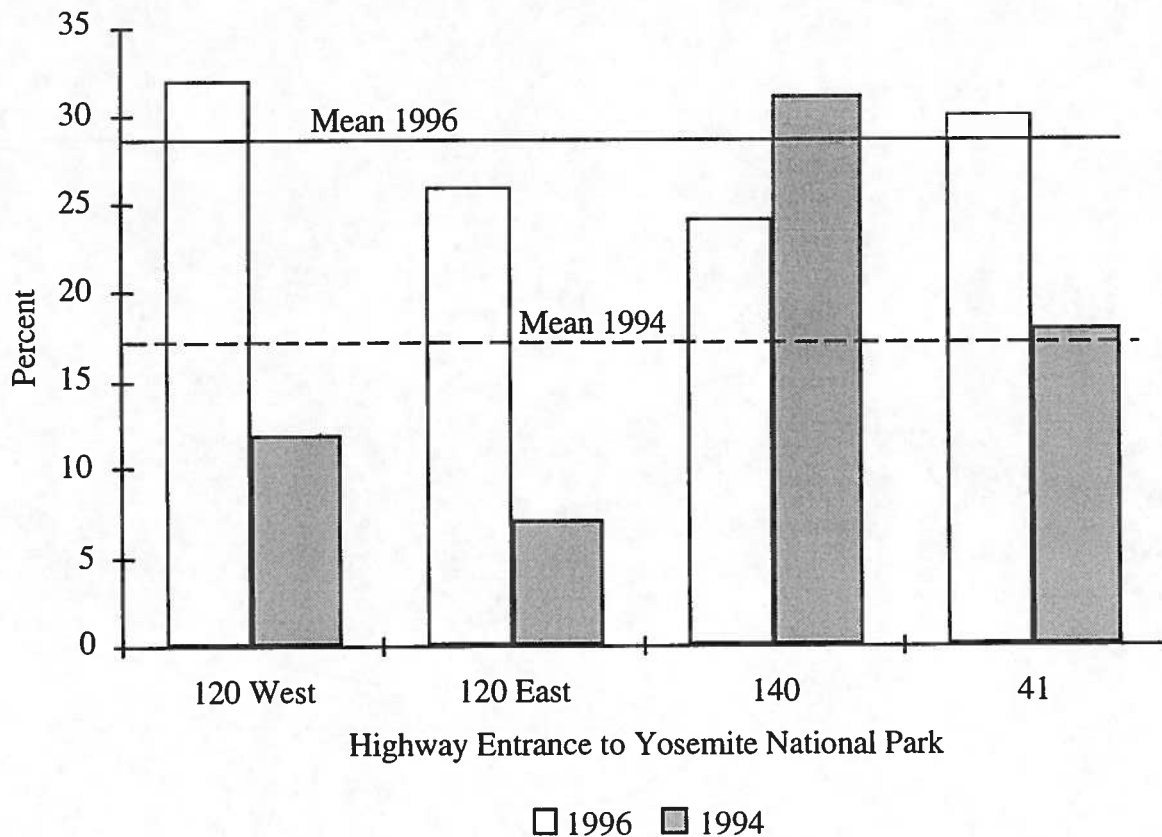


Figure Two: Percent of Auto Survey Respondents Who Tuned in an HAR, by Route into Yosemite National Park, 1996 and 1994.

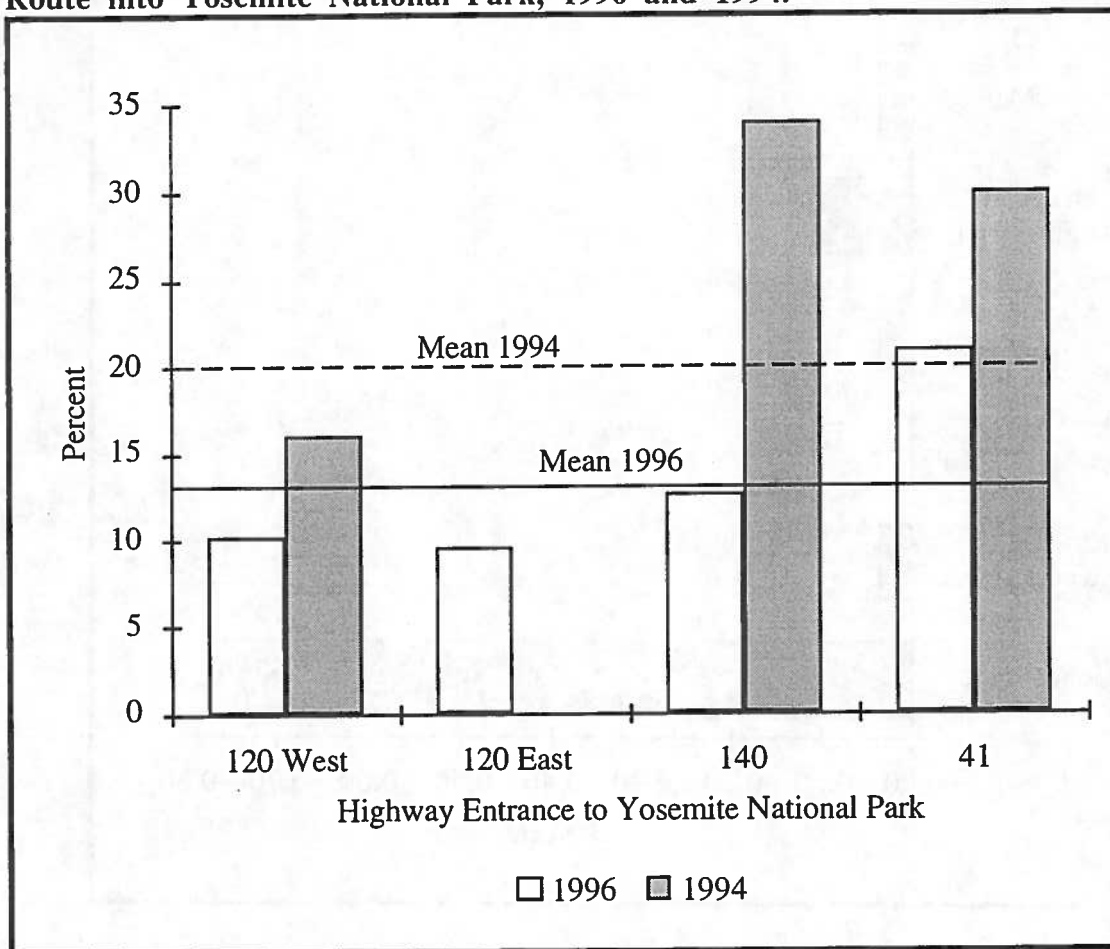
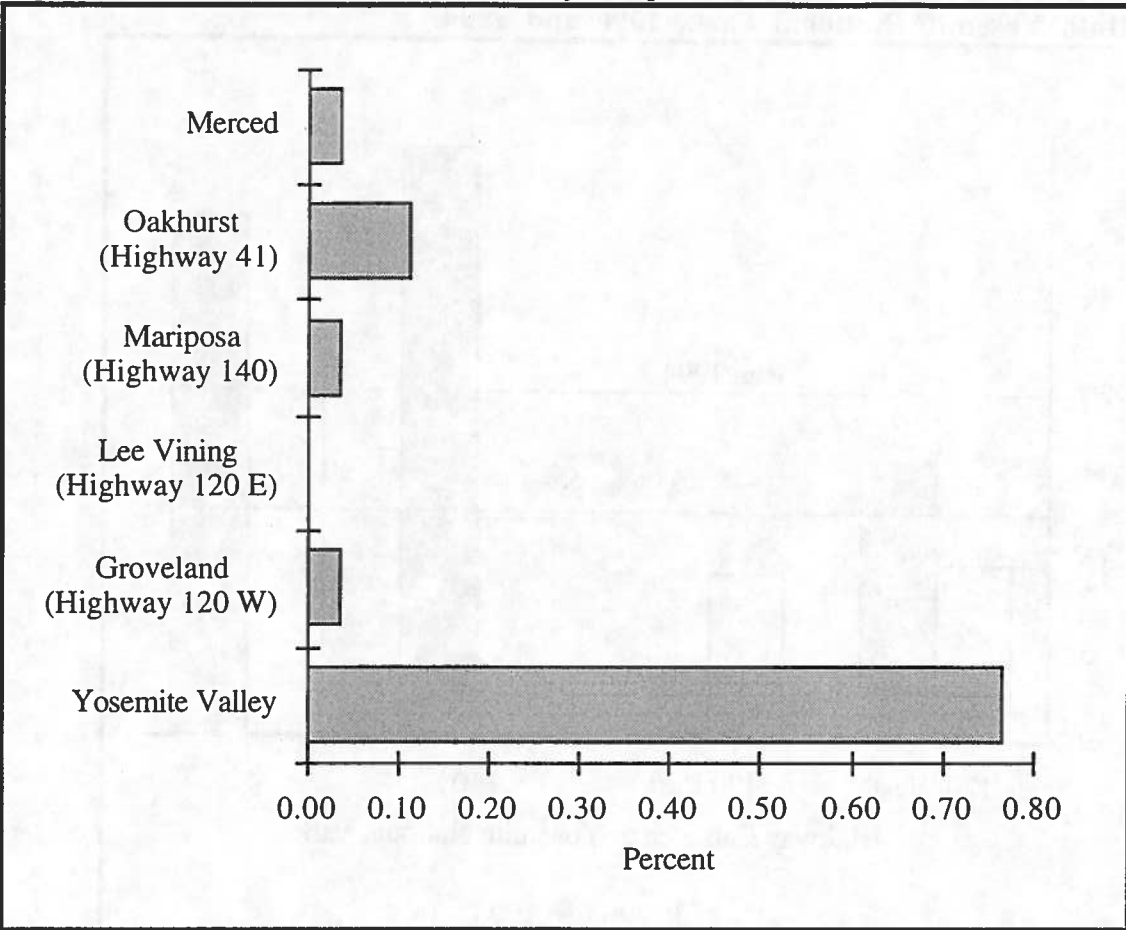


Figure Three: Percent of Auto Survey Respondents who Used each Kiosk



LIST OF TABLES

Table One: Percent of Auto Visitors Samples who Saw or Used each YATI Information Service in each Year

LIST OF FIGURES

Figure One: Percent of Auto Survey Respondents Who Recalled Seeing a CMS, by Route into Yosemite National Park, 1996 and 1994.

Figure Two: Percent of Auto Survey Respondents Who Tuned in an HAR, by Route into Yosemite National Park, 1996 and 1994.

Figure Three: Percent of Auto Survey Respondents who Used each Kiosk

