REMARKS PREPARED FOR DELIVERY

DEPUTY SECRETARY OF TRANSPORTATION
MORTIMER L. DOWNEY
INTELLIGENT INTERMODAL SYSTEMS CONFERENCE

GENERAL SESSION WELCOME
NEW YORK, NEW YORK
OCTOBER 14, 1994

I'd like to welcome all of you to the Intelligent Intermodal Systems Conference — a meeting which focuses on two of our highest priorities at the Department of Transportation.

Before I begin my remarks, I'd like to thank ITS AMERICA and the I-95 Corridor Coalition for co-sponsoring the conference. I want to commend their commitment to focusing public attention on issues that are going to define the future of transportation.

Intelligent transportation systems and intermodalism may have been just buzz words in the past. Tomorrow, they will be real solutions to increasing travel demand and limited public resources.

They also will help us achieve the national goals Secretary Peña set forth in our Strategic Plan in the areas of safety, air quality, energy conservation and greenhouse gas emissions.

Progress on Intelligent Transportation Systems

USDOT — together with ITS AMERICA — has accomplished much in a short time as we begin to build an intelligent transportation systems industry.

We have invested hundreds of millions of dollars in intelligent transportation projects, and our field testing has given tremendous credibility to the budding intelligent transportation systems industry. Most of the major defense contractors now see ITS as a significant opportunity for civilian commercial work.

Our programs also have drawn substantial private sector involvement, but an ever greater private sector role is necessary if we are to have widespread deployment in the near future.

Nearly half of the stated departments of transportation — agencies traditionally concerned more with road construction and maintenance — have participated in the early field tests, thereby involving a key group of players.

And finally, our programs have attracted telecommunications and consumer products and service companies to the field, providing the same customer-driven focus we're instilling at the federal level as the Clinton-Gore Administration reinvents government.

Toward An Intermodal Transportation System

USDOT also has made strides toward developing a true intermodal transportation system — something which previously was only the subject of dry reports by a few visionary planners.

We have increased funding flexibility between modes, worked toward unifying planning processes and proposed a National Highway System which will be the basis of an intermodal National Transportation System.

Over the next year we will define and identify this National Transportation System in cooperation with both the public and private sectors, and we will plan to use it to shape federal transportation investments into the next century.

The Links Between Intelligent Systems and Intermodalism

There has been a lot said — and done — about intelligent systems and intermodalisms, but, for the most part, they've been thought of as separate issues.

However, it's increasingly clear that intelligent systems and intermodalism must work together. We can't fall into the trap of developing intelligent systems for only one mode — or of believing that intermodalism can be truly effective without the control strategies and information capabilities available through advanced technology.

We'll never get maximum value from either intelligent systems or intermodalism if we go down separate paths — indeed, ITS will make intermodalism possible on a broad scale by breaking down the barriers between modes. There has been too little said about integrating intelligent transportation systems and intermodalism at an early stage.

That's why today's conference is so important: it focuses the dialogue on these issues simultaneously, and emphasizes their linkages. Throughout the day you're going to hear a great deal from people with quite different viewpoints. I won't step on their lines now, but instead, I want to sound three themes for today's discussions.

The Need to Deploy Systems Now

First, we must focus on deploying intelligent intermodal systems — not just on theoretical research — that actually get projects on the street quickly to serve all our customers.

The first major technology out of the box is the exchange of travel information among transportation and public safety agencies. I stress the word "travel" — not traffic information — the information that allows our customers to make informed choices about all aspects of travel — mode, route, time, et cetera.

We already have a pioneering example of this right here in the New York-New Jersey area: TRANSCOM.

TRANSCOM has been so successful because it brings together 15 different public agencies and helps them communicate — using currently available information — to exchange intelligence on traffic incidents and construction.

We must have similar cooperation in metropolitan areas throughout the nation, and we must go beyond providing information to public agencies and get it to the public. TRANSCOM's leaders know that and are moving ahead with next-generation ITS projects.

The Need For A Customer Focus

The second point I'd like to make is the importance of focusing less on the technology of data collection and dissemination and more on whether customers will actually use the information, and what effect their use of it will have on travel behavior. We must understand how these projects can directly benefit travelers and assure those benefits are being delivered.

Another Northeastern success story demonstrates the direction we need to move in. The SmarTraveler project covers 122 cities over 1,400 square miles in eastern Massachusetts. It's an advanced traveler information system offering free, real-time, route specific traffic and transit information to anyone with a touch-tone telephone.

SmarTraveler now services 1.5 million calls annually and is growing at the rate of 160 percent a year. User satisfaction, as measured by independent surveys we required, is very high, with 85 percent of users rating the service at 8 or better on a scale of 10 and with a remarkable 97 percent expecting to use the service again. We've extended our sponsorship of this project to continue testing customer acceptance.

We also want to see whether a relatively simple, private, cost-effective data collection and dissemination system like SmarTraveler might do the job for certain areas — although maybe not the largest Northeast corridor cities.

The Need For Early Public Sector Leadership

The third point I want to make is, while a strong role for the private sector is critical, success for intelligent transportation systems in the short term requires public sector sponsorship and close interagency coordination.

As we move on to widespread deployment, we recognize success in the years to come will depend mainly on the play of private, free-market forces.

Roles for the Federal Government

In the early stages, we in the federal government see two clear roles for the public partners, especially at the federal level.

The first is as a catalyst, a source of seed money and expertise from the great federal laboratories that won the Cold War and the race to the moon.

This work is going to be intermodal in focus. That's why it's intelligent transportation systems and not just intelligent vehicle/highway systems.

Within DOT, it's not just an FHWA effort, but one in which the FTA, the FRA and the National Highway Traffic Safety Administration are all a part of our ITS leadership under the ITS Joint Program Office led by Chris Johnson.

A second key role is that of a standard setter — forging consensus on national and even international standards. These standards will create a "common ground" that will encourage new entrants and spur competition, while the "open architectures" we support allow the new technologies to adapt, stay flexible and accommodate further progress.

This is an absolutely critical leadership role that the federal government must play because no one else can or will.

The Promise of Intelligent Intermodal Systems

We've had some genuine successes at building the foundations for an ITS industry. Indeed, this is an area where the United States can be the world leader, first, by developing these technologies and creating a multi-billion dollar market for American products, and second, by reducing our transportation costs and giving us a real competitive advantage over our global competitors.

These successes are just the beginning.

The intelligent transportation systems I envision will let trucks cross borders without stopping, cut traffic congestion and improve safety and air quality, provide in-vehicle navigation aides, collision avoidance systems and vehicle identification chips to track deliveries and frustrate thieves.

These systems will allow full integration of all forms of transportation, so travelers will be able to move seamlessly from one mode to another, using a single form of payment.

Sooner than most of us dare to believe possible, ITS technologies will lay the groundwork for the fully automated highways of the 21st Century.

Indeed, just last week Federal Highway Administrator Rodney Slater announced the formation of the National AHS Consortium, led by General Motors, which will carry out a $200 million project to develop automated highway systems.

We're going to prove the concept of automated highway systems works by having driverless cars operate over a test track within three years.

It may well be 15 or 20 years before truly automated public roads become a reality. In the meantime, we'll benefit in the near future from advances made possible by the intermediate steps and from spin-offs.

The future is coming ... soon.

Conclusions

So today, I urge you to consider these themes — getting projects deployed quickly, keeping in mind the customer focus, remembering the importance of public sector sponsorship and close interagency coordination.

As we begin our discussions of difficult, complex issues, let me close with a quotation by astronaut — now United States Senator — John Glenn:

"People are afraid of the future, of the unknown. If we face up to it and take the dare of the future, we can have some control over our destiny."

That's an exciting idea to me, better than waiting with everyone else to see what's going to happen.

I can't think of a better thought with which to begin this conference.
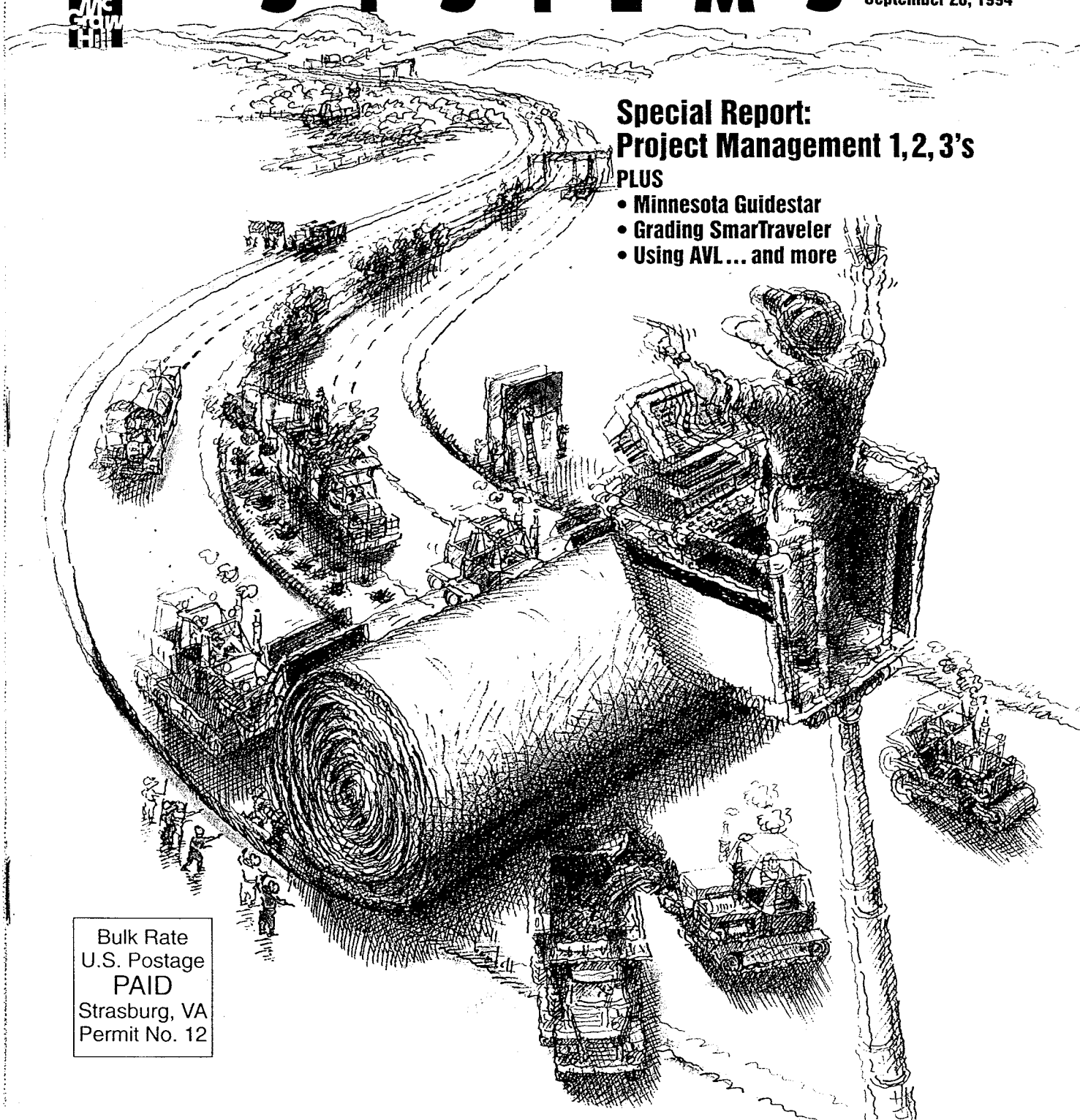
Intelligent Highway SYSTEMS

McGraw Hill

September 26, 1994

Special Report:
Project Management 1, 2, 3's
PLUS
- Minnesota Guidestar
- Grading SmarTraveler
- Using AVL... and more

LEARNING ABOUT THE SMART TRAVELER

by Stephen P. Crosby

During the past three years, nearly $320 million have been allocated and expended by two Administrations and congress for Intelligent Highway Vehicle Systems (IVHS) investment. Fully one third of those dollars, in excess of $100 million, has been invested in the Field Operational Test (FOT) program, a well-conceived effort to demonstrate new technologies ready for deployment, in anticipation of at least some of those FOTs leading to prompt deployment of significant components of the overall IVHS infrastructure.

Critics have argued that excessive congressional earmarking has hamstrung the creativity and objectivity of the FOTs and that too much of the FOT investment has focused on, in effect, research and development of technologies far from widespread deployment.

In a balanced view of the IVHS program, such criticisms have their place. However, the US DOT's rather modest investment in IVHS has proven to be a remarkably successful transportation and industry policy. Guided, in substantial part, by its unique quasi-private strategic planning arm, IVHS America, the Department of Transportation has orchestrated the development of an IVHS industry nearly equal to that of its major competitors in Japan and Europe.

Whatever its shortcomings, the FOT program, particularly, has many accomplishments:
• It has induced most of the major defense contractors to look to IVHS for a significant commercial conversion opportunity.
• It's induced significant private sector contribution to IVHS research and testing, probably to the tune of at least 100% matching dollars to the federal investment overall.
• It's attracted participation of nearly half the state Departments of Transportation in the design and/or operation of Operational Tests, thus greatly increasing the sensitivities of those road construction-oriented agencies to the benefits of IVHS technologies.
• It's induced the involvement of a wide variety of telecommunications and consumer products companies in the research and testing of various technologies, at least some of which have the realistic potential of immediate deployment.

SMARTER ROUTES. This article focuses on the SmarTraveler Field Operational Test, which represents several of the most positive principles established by and for the program. SmarTraveler is an Advanced Traveler Information System (ATIS) offering free, real time, route specific traffic and transit information to anyone with a touch-tone phone. The SmarTraveler coverage area includes 1,400 square miles and 122 cities and towns in eastern Massachusetts.

The SmarTraveler FOT was funded 50/50 by federal IVHS funds and non-IVHS contributions, with most of the non-IVHS share coming from the private sector.

The SmarTraveler FOT has been extensively evaluated by an independent contractor, Multisystems, Inc. of Cambridge, Massachusetts, on behalf of the Massachusetts Department of Transportation and FHWA.

The SmarTraveler FOT has been continued for an additional year by FHWA and the Massachusetts Department of Transportation.

SMART GOING. The SmarTraveler Field Operational Test was originally conceived at a meeting between SmartRoute Systems and Norm VanNess, then head of Traffic Operations and IVHS at the Federal Highway Administration. SmartRoute Systems and Van Ness agreed that a great deal of the IVHS focus was on the technology of data collection, data fusion, and data delivery systems—while little if any focus was being paid to the issues of consumer acceptance of advanced traveler information, and the impact that such advanced traveler information might have upon traveler behavior.
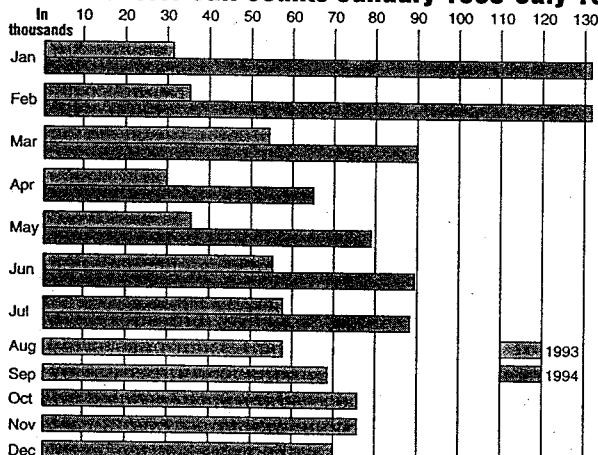
Van Ness and Steve Lockwood (then associate administrator for Policy at FHWA and now a vice-president at Parsons Brinkerhoff) speculated that for many metropolitan areas and for at least certain IVHS functions, it was possible that the privately-maintained and cost effective data collection infrastructure designed by SmartRoute Systems might be adequate, and that in any event, testing consumer acceptance of advanced traveler information was a critical component of the Field Operational Test program.

At the time the SmarTraveler FOT began, SmartRoute Systems in Cambridge, Massachusetts, had already developed and begun operations of a

Exploring routes with on-line callers.

SmarTraveler call counts January 1993-July 1994

In thousands — 10 20 30 40 50 60 70 80 90 100 110 120 130

Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

1993
1994

fully-private Transportation Information Center. This operation was designed to collect, manage, and disseminate traveler information through a broad range of existing and soon-to-be-developed electronic media.

At its operations center, up-to-the-minute information is gathered and maintained for 701 miles of major roadways in eastern Massachusetts as well as for bus, rapid transit and commuter rail lines at the Massachusetts Bay Transit Authority (MBTA).

Using a data collection matrix from the high tech to the prosaic, SmartRoutes designed the surveillance methodology for all road segments, which included 500 daily mobile probe trips; 50 live and slow-scan cameras located at critical congestion spots around the region; one to three aircraft covering the portions of the metropolitan area outside the traffic control area; direct "hotline" links to all Massachusetts transportation agencies, including the State Police; and a comprehensive database of "static" information about construction and other predictable activities, which account for as much as 30% of congestion, according to FHWA studies.

Using highly-trained Traffic Managers as a focus for fusing multiple data collection sources and interpreting real-time data for useful dissemination to the public, real-time and static data is then prepared for telephonic delivery in a Unix-driven, Ethernet-link, multi-node, multi-port, audiotext system.

The system possesses a proprietary management operating overlay designed by SmartRoutes' founder, John Liebesny, and detailed by Micrologic, Inc. of Waltham, Massachusetts, the principal designers of the LoJak Vehicle Recovery System. The SmartRoute Systems' configuration incorporates Intel 80386/486-based PC multi-tasking and disk mirroring technologies to provide the capability to update traffic information on an instantaneous basis, with no interruption in the ability of customers to call in and access the information.

The system, which is scalable, had the capacity to provide 6,000 callers per hour with up-to-the-minute traffic and transit information, at the time the SmarTraveler FOT was envisioned.

How the Service Is Used

Results of the recently completed study executed by Multisystems, Inc. and CTPS were published with findings from the first 15 months of operation of the SmarTraveler ATIS.

In a survey of over 2,000 callers to the SmarTraveler service, querying those users on their reactions to the information received from their most recent call to SmarTraveler, the independent evaluator found the impact of the service on traveler behavior to have attained the following levels:

- 48% of respondents reported information they received during the particular call about which they were being questioned had a direct influence on their travel decision-making
- 28% reported making some kind of change in their travel behavior
- 14% reported changing the time of departure
- 11% reported using a different route
- 2% reported canceling the trip
- 1% reported changing route and time
- 19% indicated they used the information to choose between two or more relatively equal alternate routes

Most of the remaining callers in some way used the information they received to verify that their preferred route would be viable. Eight percent reported they contacted others to indicate that they would be delayed based on the information they received.

How the Service Is Perceived

An independent evaluation of the SmarTraveler ATIS indicates that user satisfaction of SmarTraveler is quite high, and users find it remarkably valuable in their day-to-day travel:

- 97% of users expected to use the service again
- 85% rated the service 8 or better on a scale of 10
- 70% reported reduced frustration as a consequence of using the service
- 67% indicated that SmarTraveler provided all types of information that they desired from a traveler information service
- 64% reported the ability to avoid traffic problems
- 61% reported that they saved time
- 52% reported that they were aided in arriving on time

Under the sponsorship of the Massachusetts Department of Transportation and the Massachusetts Highway Department (MHD), the SmarTraveler operational test began offering up-to-the-minute advanced traveler information to everyone in eastern Massachusetts with a touch-tone telephone in January 1993, free-of-charge. The critical variables in measuring the success of the service and the FOT were:

- Whether travelers could be induced to use the service;
- Whether travelers who had used the service were satisfied with it and would reuse it; and
- Whether use of the service impacted on the users' traveling behavior, in time, route, or mode of travel.

GAUGING SUCCESS. Although there have been criticisms of the FOT program for the standards and rigor of the evaluation component, both FHWA and the Massachusetts Department of Transportation required a comprehensive, independent evaluation of the SmarTraveler FOT, executed by the Central Transportation Planning Staff (CTPS), technical staff to the Boston MPO, and Multisystems, Inc. Early experience with the use of the

SmarTraveler ATIS demonstrated that teaching travelers the behavior modification of accessing "intelligent traveler information" before or during their travel is a substantial challenge that will have to be faced by the entire IVHS industry; and that an accurate, useful Advanced Traveler Information Service will be used by travelers, both in and out of their cars, and that usage will grow methodically.

The SmarTraveler ATIS, at present, is servicing 1.5 million callers annually, and usage in its second year of operation is running 160% ahead of usage in its first year. One lesson learned from the SmarTraveler FOT is the critical importance played by advertising for the service, interagency support for the service, public sector sponsorship of the service, and the need for support from the landline telephone providers.

IMPACT ON VEHICLE EMISSIONS. The evaluation of the SmarTraveler ATIS substantially confirmed certain key points of focus group research independently conducted by SmartRoute Systems for an Early Findings Report, evaluating the impact of SmarTraveler on users' route, time or mode of travel. Using this data, SmartRoute Systems retained Tech Environmental, Inc., of Waltham, Massachusetts, a firm recommended by the Massachusetts Environmental Protection Agency, to assess the potential impact on air pollution of the SmarTraveler ATIS in the Metropolitan Boston Non-Attainment Area.

Based on projections of increased use of the SmarTraveler service by SmartRoute Systems, the Tech Environmental report concluded that widespread use of SmarTraveler could account for the elimination of nearly one-half ton of Volatile Organic Compounds (VOC) daily.

This would account for 1/2 percent of the total required reduction in VOC from the base year 1990 to the target compliance year of 1999, and almost 7% of the projected requirement from new Emission Reduction and Highway Operations, Transportation Control Measures (TCM) that remain to be implemented.

HOUSTON

interference and to compile different data. The tags from the toll road, though, will continue to be read by the AVI antennas used for traffic monitoring on Houston's other highways. An additional 3,200 tags are being issued by TxDOT for Phase II, scheduled for completion in fall 1994. An additional 52 readers and 288 antennas are being installed on the highways and adjacent HOV lanes. One strategy is to provide tags to key commercial users who use the road frequently and whose patterns need to be monitored.

The final phase of the project is scheduled for completion by summer 1995. Phase III will complete the AVI system on Houston's radial highways, all HOV lanes, the rest of the I-610 loop and the Sam Houston Tollway. City buses will be among the vehicles receiving an additional 2,500 tags during this phase of the project. Readers will be placed at the entrances and exits of the HOV lanes to provide vehicle location and bus scheduling services, and additional roads with heavy bus traffic will be supported in the AVI system to facilitate city bus routing.

DELIVERING INFORMATION. Data collected with the AVI system is used by various transportation agencies to analyze the effect of traffic management strategies and to assist in the development of new programs.

Real-time data also allows control center operators to change the variable message signs along the highway to inform travelers of current travel conditions and possible down-the-road incidents.

As an ATMS, one of the five IVHS initiatives, the system can help provide travel times, surface conditions and alternate route information to drivers through the sign boards or radio broadcasts. Delivering vital traffic information directly to commuters has proven to be more timely and accurate.

Information on HOV lanes, for example, may be the most critical data compiled by the central control facility. If speeds on the HOV lanes drop to less than 40 mph, TTI recognizes instantly there is a problem that must be addressed immediately. Comparing and contrasting the travel time on the HOV lanes to the travel time on the other highway lanes, where average rush-hour speeds approaching 40 mph are often just a fantasy, is another value to the AVI system.

As these comparisons are relayed to commuters, the number of drivers choosing to use the HOV lanes may increase, reducing the overall amount of vehicles on the road. An AVI system

on HOV lanes also can be used to monitor and enforce authorization.

In the future, information gathered from the traffic monitoring system will be available to commuters in their vehicles, homes or offices, where travel decisions and routing can be made in advance. Travelers may receive the same display the TTI monitors in the central control facility. For commuters who access the traffic information, custom displays of routes—a feature called Smart Commuter—will be available.

Overall, the entire project is designed to enhance mobility, reduce travel time and cost, increase travel safety and improve environmental effects.

ADVANCED TRAFFIC MANAGEMENT. Other metropolitan locations in the U.S. have studied and tested AVI systems for use in monitoring and managing traffic. Compared to traditional loop-sensor systems, AVI systems such as the one developed for the Houston ATMS can be installed faster with little or no traffic interruptions, and have proven to be more accurate and dependable. And, as other demands are made for traffic management, the AVI system in Houston will be adapted and upgraded.

The use of the current system in conjunction with additional traffic management systems, including closed-circuit television monitoring, will enhance the capabilities of the central control facility. Incident assessment and emergency vehicle routing are two areas that will be affected by advances in the monitoring system.

TTI also will be capable of tracking vehicle movements from one roadway to another, which will improve monitoring of traffic patterns. With increased pattern monitoring, traffic flow programs can be developed to improve traffic efficiency. And while the AVI system in Houston uses basic identification equipment, future modifications may be made to include read-write communications, bringing traffic information into the vehicle.

With the system more than halfway installed, the project has proven to be beneficial for all involved—public agencies, private companies and highway travelers. The informal partnership created by the public and private sectors has facilitated the gathering of accurate information on traffic congestion and increased their knowledge and understanding of traffic flow in the metropolitan area.

While commuters on I-10 in Los Angeles and Jacksonville still fight congestion every day, drivers using I-10 in Houston are helping ease the daily commute in the future.   **IHS**

FRANK DORRANCE is director-IVHS programs, Amtech Systems Corp.

TRAVELER

FUTURE IMPACT. The IVHS Program gestated and managed by the U.S. Department of Transportation and the United States Congress is constrained and defined by the same pressures of budget, politics and—more uniquely—technology that constrain and define all the major public policy initiatives of our time.

But within these constraints, the IVHS initiatives of US DOT and Congress under the stewardship of Senators Moynihan and Lautenberg and Representative Carr, surely have as much potential to enhance American competitiveness, produce jobs, improve the mobility of goods and services, and reduce the deleterious environmental impact of vehicle miles traveled as any other major public policy initiative of the past 50 years.   **IHS**

STEPHEN P. CROSBY is chairman of SmartRoute Systems, Inc., based in Cambridge, Massachusetts. SmartRoute Systems designs, develops and operates Advanced Traveler Information Systems.

CALENDAR

OCT 5-7. ATMS Meeting, San Antonio, TX. Contact IVHS America, Bo Strickland, 202/366-1993

OCT 11-13. GovCom '94: The Government Computer and Networking Forum, Washington Convention Center, Washington, DC. Contact Reed Exhibition Co., 301/495-7100 or 800/7GOVCOM *(Editor's Note: This show is being held in conjunction with Interchange '94: The Summit of the Intergovernmental Enterprise")*

OCT 11-13. Interchange '94: The Summit of the Intergovernmental Enterprise, Renaissance Hotel and Washington Convention Center, Washington, DC. Contact Reed Exhibition Co., 301/495-7111 *(Editor's Note: This show is being held in conjunction with GovCom '94: The Government Computer and Networking Forum)*

OCT 23. IVHS Planning Committee, Troy, MI. Contact IVHS America, Doug Robertson, 202/484-2898

OCT 24-25. IVHS America Coordinating Council Meeting, Troy, MI. Contact IVHS America, Bonnie Jessup, 202/484-2896

OCT 31-NOV. 3. Photonics for Industrial Applications, Hynes Convention Center, Boston, MA. Contact The International Society for Optical Engineering, 206/676-3290

NOV 1-2. Federal Imaging 1994: The Document Management Conference and Exhibition. Contact Reed Exhibition Co., 301/495-7100 or 800/354-4003

NOV 29. IVHS America Board of Directors Meeting Hotel Concorde Lafayette, Paris, France. Contact IVHS America, Bonnie Jessup, 202/484-2896

March 1995

Association News

Informed Public Will Use Travel Alternatives, Survey Finds

A recently conducted survey of the SmarTraveler operational test in the Boston metropolitan area highlights the potential benefits cities and regional planning organizations can reap from Advanced Traveler Information Systems (ATIS) if they can overcome one significant obstacle.

According to preliminary findings of the evaluation, which was sponsored by the Massachusetts Highway Department, there is tremendous inherent potential, when traveler information services are used, to influence the public's travel-related decision-making processes. An ancillary result is reduced traffic congestion and air pollution, the survey found.

But first, the public must transcend a "behavioral threshold that allows them to use the services," says Steve Crosby, chairman and CEO of SmartRoute Systems of Cambridge, Mass. and an ITS America member, which provides SmarTraveler services. "The research is clear that if enough people use these services, there will be an impact," he says.

"The challenge is to get people to use SmarTraveler enough that they begin to change their thinking and their behavior," says Crosby. "The challenge is to get people to remember our telephone number and then to think to use the service."

SmarTraveler provides "real time comprehensive traffic flow information on 700 miles of roads in the Boston metropolitan area," which customers access through a telephone call, says Crosby. The service will also suggest alternative routes for drivers, where they are available, he adds.

Real time information on public transit (bus, subway and commuter rail) running times is also available. The service will also suggest alternative modes of travel to the same destination, he says.

In all, 2,000 SmarTraveler users were surveyed, Crosby said. The findings suggest that travelers, armed with timely information, will consider alternatives to their original travel plans. The findings include:

● 49 percent said the information they received during the particular call they were being questioned about played a direct role in their travel decisionmaking;

● 29 percent said they changed their travel behavior as a result of the information provided by the service;

● 14 percent changed the time of their departure;

● 12 percent used a different route;

● 2 percent canceled their trip;

● 1 percent changed their route and time;
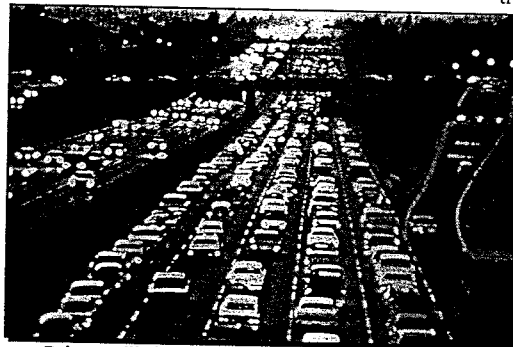
Drivers will change their travel plans if sufficiently informed of traffic conditions, a recent survey found.

● 1 percent changed from a private vehicle to public transit

● 20 percent said they used the information to choose between two or more relatively equal alternative routes;

● Most of the rest of the callers used the information in some way to verify that their preferred route was viable;

● 8 percent said they contacted others to inform them they would be delayed.

While it will take time for customers to change their travel behavior, Crosby said, the survey turned up virtually no resistance to the service. "We found very high acceptance [of the services]," he said. "Consumers just have to be assured that the data we provide is timely and accurate."

Toward that end, SmartRoute has launched a "modest" television and radio advertising campaign, run promotional campaigns with public agency partners and distributed fliers and cards, said Crosby. "We're doing everything we can think of to remind people that this service is available," he adds.

Those travelers who presently use the service (as many as 20,000 a week by Crosby's estimates):

● 97 percent expect to use the service again;

● 85 percent rated the service an "8" on a scale of "10";

● 68 percent said the service helped them reduce travel-related frustration and stress;

● 67 percent said SmarTraveler provided them with all types of information they desired from an ATIS;

● 63 percent said the service helped them avoid traffic problems;

● 59 percent said they saved time;

● 51 percent said they were aided in arriving on time at their destination.

An environmental impact study conducted by Tech Environmental, Inc. of Cambridge, Mass., supported SmartRoute's contention that increased use of SmarTraveler would result in reduced automobile exhaust emissions, Crosby said. The Tech Environmental report was underwritten by SmartRoute.

Widespread use of SmarTraveler throughout the Boston metropolitan area, the Tech Environmental report concluded, could eliminate nearly 1,000 pounds of Volatile Organic Compounds from the air daily. This is almost 7 percent of the projected requirement from new Emission Reduction and Highway Operations, Transportation Control Measures that remain to be implemented.

SmarTraveler began life as the first operational field test funded by the Federal Highway Administration under ISTEA of 1991.

INSIDE IVHS

INTELLIGENT VEHICLE/HIGHWAY SYSTEMS UPDATE

Dial and Drive—Or Don't

The public's first contact with the Cincinnati-area ARTIMIS system (see story page 4) will be by phone. Through a contract with TRW Transportation Systems of Sunnyvale, Calif., the prime contractor on ARTIMIS, SmartRoute Systems of Cambridge, Mass. is scheduled to begin offering a traveler advisory telephone service at the end of June.

As in its work in the SmarTraveler program in Boston (see *Inside IVHS*, Nov. 9, 1992), SmartRoute plans to gather traffic information via cameras, aircraft, probes, scanners and speed sensors, and by communicating with drivers of service vans and with area dispatchers—though not all those means will be used in the early operational phase this summer. SmartRoute initially will deliver the information only by phone, but in the fully operational system, a wide area highway advisory radio system (HAR) and forty fiber optic changeable message signs (CMS) also will be available.

Cincinnati does not presently offer commuters all the modal options that Boston does, such as subway and commuter rail systems. But it is "unique in the nation" in that it has two parallel Interstate highways that are extremely close, says Dory Montazemi, deputy executive director of the Ohio-Kentucky-Indiana (OKI) Regional Council of Governments. One is I-75 and the other is a combination of I-71 and I-471. Five connections between those highways are included in the ARTIMIS system. "It makes it very convenient to actually divert traffic from one major system to the other in the event of a major problem," he says.

Montazemi has high expectations for the ATIS system that SmartRoute will provide. In an independent survey of 2,000 users of the SmarTraveler telephone service that came out last spring, 49 percent of the respondents reported that the information they received "had a direct influence on their travel decision-making," and 29 percent reported making a change in their travel behavior because of this information. "When I read that information I was really flabbergasted," says Montazemi. Using the evaluation data, SmartRoute retained Tech Environmental, Inc. of Cambridge, Mass. to estimate air quality benefits in the Boston area. Tech Environmental "concluded that widespread use of SmarTraveler can account for the elimination of nearly one-half ton of Volatile Organic Compounds (VOC) daily," according to a SmartRoute press release.

Based on these reports, Montazemi says he expects every metropolitan area eventually "will have some sort of a SmartRoute system." One of the advantages is that it is "partly privatized" and therefore cost effective. "They don't really charge you the full-blown cost because they do make money on the side by selling information," he says. In Boston, SmartRoute currently sells traffic information to cellular phone companies, a paging company, and the broadcast media, says David Stein, executive vice president at SmartRoute. Montazemi also points out that the SmarTraveler test in Boston did not involve pre-existing IVHS infrastructure. He looks forward to seeing how the traffic information service works when it is used in conjunction with a government-owned ATMS.

The Cincinnati operation will be the first SmartRoute facility outside Northeast Corridor. The company currently operates two centers in Boston—one for SmarTraveler and one for the Central Artery Tunnel construction project—and one in Bridgeport, Conn. that monitors 56 miles of I-95.

Kentucky and Ohio Prepare RFPs for ATMS-ATIS Project

Seek to regulate traffic flow, cut pollution in Cincinnati-Northern Kentucky area, including parts of I-75. System costing $35 million to be operational by October 1996. SmartRoute to begin ATIS this summer.

The National Highway System Needs IVHS

By Rodney E. Slater, Federal Highway Administrator

The central issue facing the deployment of intelligent vehicle-highway systems (IVHS) in the coming years is, I believe, mainstreaming the use of technology to help the nation achieve important transportation and societal goals.

For example, how can we use technology to help us achieve the goals presented to us in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, such as intermodalism, transportation efficiency, and the establishment of a National Highway System (NHS)? How can we use technology to help us meet the goals for clean air, established under the Clean Air Act Amendments (CAAA) of 1990? In addition, how can we use technology to help us respond to other important societal goals, such as accessibility to jobs, productivity, and safety?

Most of us here at the Federal Highway Administration believe that IVHS can help us answer these questions. But we need to accelerate our efforts....

... While not all the benefits are visible at present, we have seen enough accomplishments resulting from IVHS operational tests to be encouraged. For example, the investment in the TravTek operational test of route guidance in Orlando, Fla., spawned several innovative systems and products that are in use by the City of Orlando and the State of Florida to manage traffic better and provide improved traveler information.

As a result of research conducted under California's IVHS research program and supported with federal funds, new vehicle warning systems have been developed and are being used on the entire fleet of Greyhound buses. We are learning from the SmarTraveler operational test in Boston that people appreciate the value of real-time travel information to know about the incidents, construction, and transportation services. We also know from this project that the market for information grows as travelers experience the benefits that they can derive from it.

Over the next several years, we will show from these projects that there are real benefits from IVHS technologies. More importantly, we need to show that the technologies are not solutions looking for problems. Our outreach, our technology transfer, and our technical assistance programs will help in this regard.
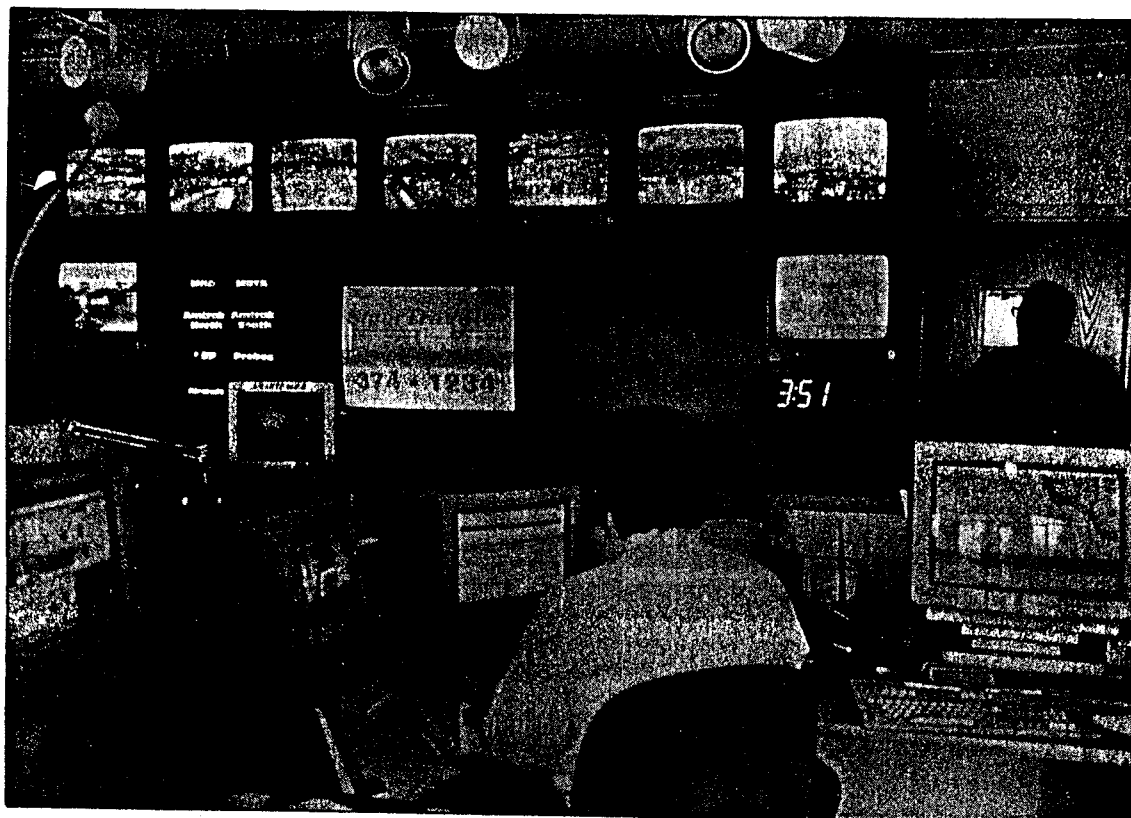
PHOTO BY JANE TYSKA

In the SmarTraveler control room at SmartRoute Systems in Kendall Square, monitors give a view of traffic conditions at 50 strategic locations.

Commuters urged to travel 'SmartRoute'

BY ERICH D. LUENING
Special to the Chronicle

Far beneath Rob Kelly's office, most of Greater Boston drives to and from work every weekday. During the busiest hours of traffic — the morning and evening commutes — it can get a little crazy. But at 1,500 feet it doesn't hamper his work, it helps.

Kelly is one of a handful of pilots who flies traffic surveillance out of the Beverly Flight Center of SmarTravelers, a free phone service developed by SmartRoute Systems on Portland Street in Kendall Square. The service gives up-to-the-minute, route-specific traffic updates every day of the week, except Saturdays.

The company was founded in 1988 by John Liebesny, the current CEO, on the idea of developing a way for commuters to get real-time traffic and public transit information as easily and as quickly as possible.

"In the beginning he wanted to develop something that could be installed in your car that would print out traffic conditions and directions, but this was prohibitively expensive," said Katy Miller, Marketing Manager at SmartRoute Systems.

Liebesny quickly decided on the telephone.

"The telephone is something that is being used so much by people for doing lots of things, like shopping and getting the weather," Miller said.

> *"The criticism I've heard seems to be from the uninformed... The difference between this and [TV and radio reports] is that SmarTraveler is route specific and has more means of data collection."*
>
> **Steve Peppin, Mass. Highway Dept.**

After selling his idea to the Federal Highway Administration in order to get funding for his system, he launched SmarTraveler in January, 1993.

The system, the first of its kind, currently receives half of its revenue from Mass Highway Department (MHD) funds and the rest through providing traffic information to WCVB/Channel Five and Nynex for its cellular phone customers.

"We also contribute commercial time that SmartRoutes gets to promote SmarTravelers," Miller said.

SmarTravelers earns every cent.

The system is comprised of many different levels of data gathering sources within the Interstate 495 belt, including the Mid-Cape highway during the summer. Not only does it have up to three different fixed-wing aircraft flying the skies over greater Boston, it also relies on 50 closed-circuit cameras set up through out the area. In addition, more than 200 mobile probe units — every day commuters — report to the traffic center located in Kendall Square on what they see on their commute via cellular phone. The company pays them for these calls.

Peter Sturgis, a traffic manager for the 10 am to 6 pm mid-shift at the traffic center, said they also take reports from bus drivers on traffic conditions on their particular route.

All this information, or "static data," is received by the traffic center where it is interpreted by computer and traffic center personnel

"The system can take information in from all of these sources and input this into the traffic center where it is sort of churned up and spit out in an order of priority so it can be spoken over the auto text system. This is updated constantly," Miller said.

The computer technology behind this is called IVHS (Intelligent Vehicle Highway System). The brainchild of SmartRoute Systems, it is recognized by the Federal Highway Administration as a system that can help mitigate traffic congestion, thus pollution, according to Miller.
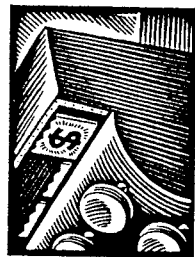
Commuters urged to travel 'SmartRoute'

SMARTROUTE, from page 11

The Massachusetts Department of Transportation recently completed a study of more than 2,000 SmarTraveler users.

According to SmartRoute, 48 percent of the users said the information they received from the system "had a direct influence on their travel decision making — including changing departure times, using different routes or using public transportation. The research [shows] that users of SmarTraveler find it remarkably valuable in their day-to-day travel, and 97 percent expect to use it on a regular basis.

"There is potential there. But it's still under way," said Steve Peppin of the Bureau of Transportation Planning in the Massachusetts Highway Department. He is project manager of the SmarTraveler contract.

Although the system obviously has its supporters from users and state onlookers alike, some question the difference between it and traffic information given over radio and TV.

"The criticism I've heard seems to be from the uninformed," said Peppin. "The difference between this and the more traditional forms of getting this information is that SmarTraveler is route specific and has more means of data collection."

While its use has increased overtime, the customer base continues largely of repeat users, according to Miller. This has led the company in conjunction with the Mass Highway Department to launch a major marketing and advertising campaign, one that includes TV and radio spots as well as billboards.

"Our goal is to make SmarTraveler a household name like time and weather," Miller said, referring to other well-known phone services.

The campaign focuses on the SmarTraveler phone number — 374-1234 — and is designed to build awareness and usage of the service, and will run through October, according to Jack Rossin, who's strategic marketing consulting firm has been called in to direct the campaign.

If all goes well, the people at SmartRoute Systems and Mass Highway hope the service will soon be used by most commuters, lessening the congestion on the highway, the pollution in the air and the craziness under Rob Kelly's office.

ENTERPRISE

SmartRoute: In the right direction

John Liebesny, left, and David Stein of SmartRoute Systems help Boston area drivers find the right way.

photo by Tsar Fedorsky

by CATHRYN J. PRINCE
JOURNAL STAFF

For drivers tired of the parking lot-like nightmare on the Tobin Bridge or the gridlock in Kenmore Square after a Red Sox game, help is at hand.

SmartRoute Systems, a Cambridge-based company, has developed a way to guide motorists around the trouble spots. The means? SmarTraveler, a free, up-to-the-second traffic and public transit report that users can call either before or during their trip. The report includes real-time travel conditions, as well as alternate route and transit options.

"The seed for the idea grew out of frustration from driving [Route] 128 everyday," said John Liebesny, 46, the company's president and CEO. "I thought: Wouldn't it be neat if you're in the car and as you're coming to Route 128 you could find out whether to continue to Route 2 or crossover to [Route] 9? Wouldn't it be nice to just push a button and get an answer?"

Founded in 1988, the privately held company is a leader in designing, developing and deploying Intelligent Vehicle Highway Systems, or IVHS.

Liebesny, an electrical engineer with an M.B.A. from the Harvard Business School, worked for Hewlett-Packard Co. for 10 years before starting SmartRoute. SmarTraveler was launched on Memorial Day 1991.

The company has raised $4 million from individual investors. It had revenue of $1.5 million in 1993 and has nearly doubled that in just the first half of this year, bringing in about $2.9 million, said David Stein, 43, the company's executive vice president.

Commuters can dial the service for the cost of an ordinary phone call to Cambridge. The phone number is (617) 374-1234. The company receives no revenue from the phone calls. Its money comes from providing traffic reports to WCVB-TV, Channel 5, and WODS-FM, as well as contracting with other entities— so far in Ohio, Kentucky and Indiana—who need traffic info.

TRAFFIC

"We were looking for reliable, up-to-date in-travel information and we feel they do a good job of that," said Neil Ungerleider, managing editor of WCVB-TV. "Primarily they do reports for our Eye-Opener news show between 5 a.m. and 7 a.m. and the 6 p.m. news on Friday. And if there's a big traffic problem during the middle of the day, they'll do some reporting for us."

In addition, SmartRoute, which has 30 employees, was recently awarded a subcontracting role by the I-95 Corridor Coalition to design Traveler Information Systems.

The Federal Highway Administration also has invested more than $2 million into the program as part of its ongoing exploration of ways to ease traffic flow in cities across the country.

"Our program focuses on the development and implementation of IVHS user services to help users of the transportation system get better information before and during their trip," said Matt Miller, a transportation engineer with the Federal Highway Agency. "So this SmarTraveler project was kind of a unique way to deliver real-time conditions to travelers."

Inside its office, SmartRoute operators monitor traffic conditions on 701 miles of road within Route 495 by watching 10 black-and-white video screens. The call-in system can handle up to 6,000 calls in an hour.

"In some ways we provide market information to people," Stein said, so they can "make a good transportation decision before leaving for the office, or their home. They can find out if the Green Line is broken down at Kenmore Square or if Storrow Drive is hopelessly congested."

Aside from the Cambridge office, SmartRoute uses the first floor of an old Wang Laboratories building in downtown Boston to deal with complaints regarding construction on the Central Artery. The center operates 24 hours a day, seven days a week.

The company collects traffic information in a variety of ways. Video cameras have been mounted in 50 locations in the greater Boston area, including the Sagamore and Bourne bridges—the entrances into Cape Cod.

In addition, SmartRoute Systems leases airplane time and has enlisted the service of Logan Airport's Massport buses to monitor the airport's traffic.

The system also can help before people leave for destinations. Events like presidential visits, Red Sox games, and road construction sites are reported, to let people know where trouble lurks.

"About 30 percent to 40 percent of congestion in a metropolitan area like Boston is because of stuff you can know about ahead of time," Liebesny said.

It has been challenge to increase the number of SmarTraveler users, simply because the concept is so unfamiliar, said Stein, who likens the service to creating awareness about automatic teller machines.

But thanks to a publicly financed advertising campaign, the company's call count is up 158 percent during the first six months, to nearly 1.2 million users.

To see how users like the service, the Massachusetts Highway Department began a study 18 months ago. The department has followed up on an average of 100,000 calls placed to SmarTraveler each month. Preliminary reports indicate an overall satisfaction with the service.

The service had a direct influence on the travel decisions of 47 percent of the respondents. Of those surveyed, 8 percent said they were sufficiently alerted to be able to call ahead to jobs or appointments to say they would be delayed.

Ninety-seven percent said they expected to use the service again, and 85 percent said they rated the service an 8 on a scale from 1 to 10. Sixty-eight percent of the service's users said they were less frustrated as a result about traffic conditions and 63 percent said they were able to avoid a traffic problem because of the service.

Future plans call for developing a navigational information system that could give a caller the best route possible between two points, given the traffic conditions at the time of the call. The company is looking at new means of disseminating information like pagers and interactive cable.

"Maybe someday you'll turn on your PC at work and check how the traffic is on Summer Street before leaving your downtown office," Stein said.