Transportation Management Centers

Traveler Information Dissemination Strategies

February 1996

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**Traveler Information
Dissemination Strategies**

**Final Report
February 1996**

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TRAVELER INFORMATION DISSEMINATION STRATEGIES

Shawn C. Alsop
Federal Highway Administration
February 1996

FOREWORD

The Office of Traffic Management and Intelligent Transportation Systems Applications surveyed transportation management centers (TMCs) across the USA to form an inventory of the strategies currently being used for traveler information dissemination. The objective of this document is to quantify these strategies, and then make the information available to the public.

1.0   INTRODUCTION

The transportation management center is where information about the roadway system is collected, processed, and combined with other data. It can be the location where decisions about control strategies are made, coordinated with other agencies, and implemented. Research and experience have shown that travelers want and use real-time information. Types of traveler information which can be disseminated include: traffic conditions, alternative routes, adverse weather and driving conditions, construction and maintenance activities, special lane use and roadway control measures currently in operation, as well as multi-modal information. With current and accurate information, travelers are able to make more informed decisions regarding travel modes, departure times, and travel routes. A number of existing and emerging technologies are available to facilitate information dissemination to travelers.

Thirty-three written surveys were sent to TMCs across the country. As of February 1996, 31 surveys were completed and returned. Twenty follow-up telephone interviews were completed. The results of the written surveys and telephone interviews for the responding TMCs are included in this report.

2.0   TRAVELER INFORMATION DISSEMINATION[1]

In order to be effective, dissemination of traveler information must be completed in an accurate and timely fashion to travelers. Information disseminated by TMCs can be classified as either pre-trip or en-route. Pre-trip travel information is generally accessed by potential roadway users from their homes, workplace, or other major traffic generators and is used to help plan travel routes, travel modes, and travel departure times. Pre-trip travel information dissemination strategies can include cable television (CATV), personal computers/modems, interactive information kiosks, and real-time-dial-in telephone systems. En-route travel information includes

all information received by travelers during their trips. En-route travel information dissemination strategies can include variable message signs (VMS), highway advisory radio (HAR), and radio broadcasts. The following paragraphs include a list of current traveler information dissemination strategies which were addressed in the survey. However, it should be noted that this is not an all inclusive list, since technologies are emerging.

2.1   Cable Television

Through public/private partnerships between transportation agencies and local cable companies, CATV is being used to broadcast live video from freeway surveillance cameras to travelers. This enables travelers to view real-time traffic conditions before they begin their trip. With this information, the travelers are able to make informed decisions as to what travel route to take, what travel mode to take, or whether or not they should change their departure time. In San Antonio, TransGuide purchased their own low power television station which provides vehicle and digital data to subscribers.

2.2   Personal Computers / Modems

Through the use of the Internet's World Wide Web, personal computers are being used as a method of disseminating traveler information. The information is sent out using text, graphics, and/or photographs. The information can include graphical representations of roadway networks depicting real-time speeds (different colors are used for various freeway segments showing varying speed/congestion levels), real-time "snapshots" of existing conditions taken from the closed circuit televisions cameras, real-time weather conditions, incident locations, and scheduled construction and maintenance roadway closures. Some TMCs even include multi-modal information. For example, Seattle's Web page includes bus and ferry schedules, while Oak Park (Chicago), Illinois includes public transit bulletins on its Web page.

2.3   Information Kiosks

A kiosk is a combination video monitor/computer mounted in a stand-alone cabinet which allows the public to interact and retrieve requested information via touch screens or keyboards/pads. Through improvements in communication mediums and computers, kiosks are capable of disseminating real-time traveler information that is location/freeway specific and on-demand traffic operations information. The information is provided in either a text format and/or a graphical format. The Los Angeles and Atlanta systems' kiosks provide mass transit information.

2.4   Telephone

Some agencies are using Highway Advisory Telephone (HAT) systems. This system consists of a dial-in telephone system which distributes static (pre-recorded) traveler information such as scheduled daily freeway lane closures due to construction/maintenance activities, and

transit information. Dissemination of real-time, location/freeway specific, on-demand traffic operations information via dial-in telephone systems is an emerging technology. For instance, the Seattle telephone system provides carpool information and the ferry schedules.

2.5   Variable Message Signs

Variable Message Signs (VMS) have been used to disseminate traveler information to travelers for over 30 years. They are used for warning, regulation, routing and traffic management purposes. The signs can be controlled locally (at the sign) or remotely (from a TMC). The displayed messages can either be pre-stored messages or custom made by the operator.

2.6   Highway Advisory Radio

Highway Advisory Radio (HAR), local-area radio broadcasts, are being used to disseminate advisories and information to the public through the use of AM radio stations. Roadside or overhead signs are used to instruct the travelers to tune to a specific radio station to obtain this information. Typically, HAR is used to disseminate information pertaining to special events, incidents, and construction/maintenance activities, but also can be used to provide mass transit information as in the Miami system. The Montgomery County (Maryland) TMC's HAR consists of 12 sites which are all interconnected and synchronized so that all the sites broadcast the same information at the same time.

3.0   CONCLUSIONS

Presently traffic congestion on the roadway system is a major problem, and if methods are not implemented, it will be even worse in the future. Since building additional roadway capacity is no longer a feasible option due to economic, political, and environmental reasons, traffic management is becoming more important. Technologies have been and are being developed that monitor traffic conditions. Once this information is collected, it must be processed, and then disseminated to travelers in a quick and efficient manner, so that the travelers have adequate time to adjust their travel patterns and behaviors. Traffic management centers have been and are being implemented across the country to help alleviate the traffic problems.

Traffic management centers can create opportunities for the establishment of public/private partnerships. Some of the TMCs surveyed formed partnerships with the private sector for a variety of tasks. Some of these tasks include: developing the computer software, providing the equipment, and disseminating the traveler information provided by the TMCs.

Each of the TMCs is very unique. Some of the TMCs prefer certain information dissemination strategies over others, and it is difficult to conclude that one strategy is more beneficial than another. However, it can be concluded that a combination of pre-trip and en-route

traveler information dissemination strategies is needed for the greatest benefit.

4.0 ACKNOWLEDGMENTS

Acknowledgment and thanks needs to be given to *The Urban Transportation Monitor* for its support in giving contact persons for the TMCs. Additionally, thanks is given to everyone who responded to the survey that provided the prevailing information on traveler information dissemination strategies. The cover photo is of TransGuide in San Antonio courtesy of Kemp Davis Photography.

[1]Balke, K., Ullman, J., Starr, T., Fenno, D., Carvell, J., Nowlin, L., and Fitzpatrick, K., <u>Freeway Management Systems: A State-of-the-Practice Review</u>, Texas Transportation Institute, Texas

Traveler Information Dissemination Strategies
Summary Table

TMC	VMS	HAR	CATV	Internet	Kiosks	HAT	Others
Phoenix, Arizona	✔	✎	N/A	✔	✎	✔	Radio system
Anaheim, California	✔	✔	✔	✎	✔	✔	
Los Angeles, California (District 7 TMC)	✔	✔	✔	✔	✎	✔	Fax
Oakland, California (San Francisco Bay Area)	✔	✔	N/A	N/A	N/A	✔	TravInfo
Sacramento, California (District 3 TMC)	✔	✔	N/A	✎	✎	✔	Fax - SIGALERT
San Diego, California	✔	✔	✎	✔	✎	✔	Pagers and faxes
Lakewood, Colorado	✔	✔	✎	N/A	✎	✔	Radio and tv
Newington, Connecticut	✔	✎	N/A	N/A	N/A	✎	
Daytona, Florida	✔	✔	N/A	N/A	N/A	N/A	
Miami, Florida (Golden Glades Interchange)	✔	✎	✎	✎	✎	✎	Print and commercials
Orlando, Florida (Interstate 4 Freeway Management Center)	✔	✔	N/A	✎	✎	N/A	Metro traffic radio reports
Atlanta, Georgia	✎	✎	✎	✎	✎	✎	
Honolulu, Hawaii	✎	✎	✎	✎	✎	N/A	
Oak Park, Illinois (Chicago)	✔	✔	✔	✔	✎	✔	Pager service
Lexington, Kentucky	N/A	N/A	N/A	N/A	✎	✔	Fax
Hanover, Maryland (Statewide Operations Center / CHART Operations)	✔	✔	✔	✎	✎	✎	Broadcast fax, alpha pager, metro traffic / media
Rockville, Maryland (Montgomery County TMC)	✎	✔	✔	✎	✎	✎	Direct connection to tv stations

TMC	VMS	HAR	CATV	Internet	Kiosks	HAT	Others
Detroit, Michigan	✔	✎	N/A	N/A	N/A	✎	
Minneapolis, Minnesota	✔	✔	✔	✎	N/A	✎	Commercial radio
Las Vegas, Nevada	✎	✎	✎	✎	✎	N/A	
Jersey City, New Jersey (TRANSCOM)	✔	✔	N/A	✔	✎	N/A	Fax, media, pagers
New Brunswick, New Jersey	✔	✔	N/A	N/A	N/A	✔	
Long Island, New York (INFORM)	✔	✎	✔	✎	✎	✔	Fax, commercial radio
Columbus, Ohio	✎	N/A	✔	N/A	✎	N/A	Commercial radio
Portland, Oregon	✔	✎	✎	✎	✎	✔	
St. Davids, Pennsylvania (Philadelphia)	✔	✎	N/A	N/A	✎	N/A	Commercial radio
San Antonio, Texas (TransGuide)	✔	N/A	✔	✔	✎	N/A	
Arlington, Virginia (I-66/I-395 TMS)	✔	N/A	✔	✎	✎	N/A	
Virginia Beach, Virginia (Suffolk District TMS Center)	✔	✔	✎	✎	✎	✔	Pager system
Seattle, Washington	✔	✔	✎	✔	✔	✔	
Milwaukee, Wisconsin	✔	✎	N/A	✎	N/A	N/A	

Table Legend
VMS: Variable Message Signs **HAR**: Highway Advisory Radio **CATV**: Cable Television **Internet**: World Wide Web Page **Kiosks**: Information Kiosks **HAT**: Highway Advisory Telephone ✔ - currently operational ✎ - planned for future use **N/A** - Not Applicable

APPENDIX A
SURVEY RESULTS

Year the center opened: 1995

TRAFFIC OPERATIONS CENTER
Phoenix, Arizona

Variable Message Signs

Currently operates 27 shuttered, fiber-optic VMS boards and 2 flip-disc boards; and additional 6 shuttered, fiber-optic boards will be added to the system during Phase II construction, which is presently underway

Highway Advisory Radio

Capable for HAR in the future; However, will implement a pilot Radio Broadcast Data System (RBDS) in the very near future; the pilot program will broadcast traffic information as a sideband signal from a commercial FM radio station; the program has 2 components: (1) uses laptop computers along with GPS for use in vehicles, (2) uses a standard PC as a stationary, kiosk traffic information center; 12 vehicle units and 28 stationary, kiosk units; joint venture between several government agencies and private businesses

Cable Television

Local television stations are receiving live pictures from the CCTV cameras installed at numerous locations along I-10 and I-17; the picture sent to the television stations is controlled by the operators at the Traffic Operations Center

Personal Computer/ Modem

Capable of generating computer facilitated advisories and a World Wide Web (www.azfms.com) on Internet; use computer facilitated advisories for Emergency Response personnel, HazMat Response units, municipal agencies, Risk Management personnel, ADOT management, etc. via the Emergency Notification System (ENS) messages can be automatically sent to fax machines, numeric pages, alpha-numeric pagers, and other types of electronic devices which accept written data; currently pursuing development of computer generated voice messages and response; the World Wide Web provides general information about the system, camera images for all the currently active CCTVs (29) with a 10-minute delay in the picture, real-time graphics of speed along the 29-miles of freeway currently in the system, road closure reports for the phoenix area (this will be expanded to include all of Arizona), weather for 10 locations in Arizona (updated twice daily), links with other states' Freeway Management System sites, and local data such as from the Maricopa County Flood District; the Web site can be icon driven or text driven

Information Kiosks

Will be incorporated into the system during Phase II construction; virtually the same capabilities as the RBDS except the individual businesses will have to provide their own PC

Telephone

Currently, traffic information is provided via voice message over the telephone; a telephone number is available to the public through which road conditions are given for all State and Federal highways in the state of Arizona

Others

800 MHZ radio - the system can communicate via radio with any ADOT organization, anywhere in Arizona, through a series of relay towers; the radio system is used to communicate with HazMat personnel, Risk Management personnel, etc.

TRAFFIC OPERATIONS CENTER
Phoenix, Arizona

Formal Evaluation?

The traffic flow is continuously monitored via CCTVs and with a graphics display which shows the data being reported by loop detectors throughout the system; both the CCTVs and the graphics display provide real time observation of the effectiveness of messages deployed on the VMS boards

Utilization of the RBDS stationary, kiosk units will be recorded at location, collected, and then correlated; evaluation of the mobile, vehicle units will utilize at least one unit of a commercial fleet of vehicles which operate throughout the Metro Phoenix area; test unit(s) will be equipped with a transponder (s) to track its' (their) movements; several other units of the commercial fleet will also have transponders, but will not have the RBDS; a comparison of the travel times with RBDS and without RBDS vehicles will be analyzed to determine the impact of the RBDS test program

Computer facilitated advisories are evaluated by how much improvement is seen in communicating with various individuals and agencies as they are tied into the system; this is a subjective evaluation type of evaluation and there is no firm data available for a "before" and "after" comparison

World Wide Web utilization is evaluated by the number of inquiries and to some degree how much of the available data is reviewed; it is possible to evaluate the general geographical areas of the sites making the inquiries

Evaluation of the effectiveness of the telephone is subjective and is based on the number of calls the operators have to answer when the pre-recorded message machine is out of service

Evaluation of the effectiveness of the 800 MHZ radio is subjective and based on the number of local and statewide calls which have responded to by the operators; the number has been steadily increasing since the start-up of the TOC

PHONE INTERVIEW

N/A

Contact Person:

Phil Carter
(602) 255-7754

Year the center opened: 1988

ANAHEIM TRAFFIC MANAGEMENT SYSTEM
Anaheim, California

Variable Message Signs	5 VMS; 13 Trailblazers; LED; local/central control; composed message; automatically controlled
Highway Advisory Radio	530 HZ; monopole; used almost daily; taped messages; special event information
Cable Television	1 station; updated every minute by graphics display; information of freeway/city occupancy
Personal Computer/ Modem	TRAVIEW; online service will display freeway/city traffic occupancy in graphics form
Information Kiosks	Touch screen monitors displayed at tourist area; 2 locations
Telephone	HAT; special events information service
Others	Internet; World Wide Web
Formal Evaluation?	Very little for VMS; use CCTV to evaluate; occasional surveys; no funding for evaluation purposes

PHONE INTERVIEW

Most effective strategy	VMS used for parking management; cable television
Least effective strategy	HAR - the radius is not wide enough, therefore not enough coverage; also the operation and maintenance of the system is very cumbersome
How current are the messages?	Pretty poor, except for cable television which is relatively accurate

VMS MESSAGE CHARACTERISTICS

Length	3 lines, 21 characters
Colors	Amber color only
Text only?	NO, capable of graphics but not used
How were the messages developed?	Based on research
Advances for the future	SCOOT - real-time signal system; SMART corridor
Private sector involvement?	YES, heavy reliance on consultants
Feedback from the users	Very little - no funding
Major operational problems?	Software sometimes does not work; maintenance of the communication lines is very cumbersome
Contact Person:	Yo Baba (714) 254-5202

Year the center opened: 1971

LOS ANGELES DISTRICT 7 TMC
Los Angeles, California

Variable Message Signs	85 current; 100 ultimate; matrix; 16 are locally controlled and the others are centrally controlled; messages are composed manually; provide traffic advisories and other traffic related information only
Highway Advisory Radio	9 HARs; taped messages 530, 620, and 1610 AM; provide information on closures, detour information, and adverse weather conditions
Cable Television	1 station but it is available to others; Monday thru Friday - AM/PM periods of peak congestion; provides a map of the freeway system with graphical representation of speeds
Personal Computer/ Modem	CALTRANS Internet Web Page; Maxwell labs puts Freeway Vision (same as what is on the cable television) on Internet
Information Kiosks	72 as a demonstration project; provide mass transit information and freeway conditions
Telephone	Dedicated phone lines/modems to various media services
Others	Fax - media receives faxes giving lane closures that will significantly impact traffic flow
Formal Evaluation?	Evaluated by local universities - Cal Poly, San Luis Obispo, UC Berkeley, UC Irvine, UCLA, and USC

PHONE INTERVIEW

Most effective strategy	Public media / radio - most people will tune in or else all ready are listening to the radio or watching television
Least effective strategy	Highway Advisory Telephone (HAT) since it requires that people dial-in to hear about traffic conditions
How current are the messages?	Real-time

VMS MESSAGE CHARACTERISTICS

Length	4 lines, 16 characters per line
Colors	Standard black and white
Text only?	YES
How were the messages developed?	Based on research and engineering experience (trial and error)
Advances for the future	350 cameras will be coming on line in the next couple of years; will upgrade the system so that when a problem occurs on the roadway system, the computer will detect the problem and locate it on the system and provide the operator with a response plan (presently the operator has to find where the problem is located in the system and then must dial-up the appropriate camera); Fiber optics will be implemented through out the system which will improve the communication links to the field equipment; New building for the TMC will be constructed

LOS ANGELES DISTRICT 7 TMC
Los Angeles, California

Private sector involvement?

Good degree - the private sector develops programs and software for the TMC

Feedback from the users

NO formal survey of the users

Major operational problems?

Telephone lines used to talk to the field elements are unreliable, hopefully will eliminate this problem through the use of fiber optics

Contact Person:

Samuel Esquenazi
(213) 897-4385

Year the center opened: 1991

SAN FRANCISCO BAY AREA TMC
Oakland, California

Variable Message Signs

30 in use; 35 under construction; 90 planned; local and central control; composed messages; automatically and manually controlled; positioned 1 to 3 miles ahead of major decision points; adverse condition ahead message - what- where- when to be cleared

Highway Advisory Radio

2 in use; 15 under construction; 10 planned; monopole; 530, 1610 or other available mid-band AM frequency; taped messages of more detailed adverse and/or construction roadway condition ahead; extinguishable message signs "traffic alert tune radio AM 1610" on when broadcasting and positioned 5 to 7 miles ahead of major decision points

Cable Television

Personal Computer/ Modem

Information Kiosks

Telephone

1 in use statewide called "California Highway Information Network (CHIN)", operated by Caltrans; an 800 phone number for callers inside the State using touch tone phone for recorded messages on road conditions by entering highway route numbers

Others

TravInfo (to be operational Spring 1996) - Traveler information system for all major modes of surface transportation; public access through regional telephone numbers with menu based automatic voice phone system; also digitized data available to partnerships with public agencies and private firms for both contributing and disseminating traveler information

Formal Evaluation?

Safety, operational, and incident management studies will be addressed on an on-going basis within the San Francisco-Oakland Bay region

PHONE INTERVIEW

N/A

VMS MESSAGE CHARACTERISTICS

Length

3-line, multi-page

Colors

incandescent bulb matrix

Contact Person:

Jim Spinello
(510) 286-4538

Year the center opened: 1991

CALTRANS DISTRICT 3 TMC
Sacramento, California

Variable Message Signs

10 VMS and 1 additional sign funded; California Model 500 type which are full matrix incandescent lamp signs; locally or remotely controlled using Signview software which runs on a PC platform; typically the signs are controlled via dial-up telephone lines from the communications office in Marysville and not the TMC in Sacramento; the sign controllers contain security software that prevents unauthorized access; stored messages are available and the operator can also enter a custom message; currently most signs are located on I-80 and US 50 - display current winter road conditions; once the proposed VMS's are placed in the metropolitan area they will be primarily used to give incident information and freeway to freeway detours; the signs will not suggest alternate routes using local surface streets

Highway Advisory Radio

16 HARs in operation with 5 more planned; all use the 10 watt low power systems that operate on either 530kH or 1610kH on the AM band; most of the HARs have pre-recorded messages that can be selected with a touch-tone phone; the HARs located on I-80 and US 50 primarily give road condition reports in the winter and road construction information in the spring and summer; the HARs proposed in the metropolitan area will be used primarily for real-time traffic updates

Cable Television

TMC is co-located with the California Highway Patrol (CHP) and they provide a Media Information Officer who broadcasts traffic reports on TV and radio stations during the morning commute; currently there are no plans to add a dedicated cable channel with updated traffic information from the TMC

Personal Computer/ Modem

Currently the TMC does not maintain an electronic bulletin board system; however, the CHP does use a Computer Aided Dispatch (CAD) system which electronically dispatches CHP field units and traffic related information is available to the media via dial-up modem; currently a World Wide Web site called Smart Traveler that contains information on the State Highway System and there are plans to develop a special web site for District 3 through Caltrans Headquarters

Information Kiosks

Planned for the future as part of the TransCal Field Operational Test (FOT); will provide real time traffic information as well as information regarding other modes of travel; TRW is the main partner in this FOT and they will be collecting the traffic information from numerous sources and disseminating it to the kiosks and other special notification devices

CALTRANS DISTRICT 3 TMC
Sacramento, California

Telephone

Used to give the media additional information on incidents which may not be available on the CHP CAD; some smaller media stations that do not have CAD will request updates on traffic conditions; there is no automated phone message system specific for District 3, but there is one at the State Headquarters level; it contains information for all state routes and can be accessed using a touch-tone phone; the District 3 TMC can add messages to this system for major incidents (longer than 2 hours) so when a local caller accesses the system it will give them relevant incident information

Others

Fax - used to send out SIGALERT's or significant lane closure incidents to a media outlet that then sends it to various media subscribers

Formal Evaluation?

NONE in place at this time; construction projects are in progress that will be installing monitoring stations which will be able to determine the effects of certain strategies; these monitoring stations will be able to measure vehicle volumes and speeds; CCTV will also be installed which will aid in the evaluation; do perform short critiques after major incidents to discuss the performance of the system

PHONE INTERVIEW

Most effective strategy

VMS and HAR

Least effective strategy

Television reports since only can provide pre-trip information, can not provide en-route information

How current are the messages?

Real-time

VMS MESSAGE CHARACTERISTICS

Length

3 lines, 16 characters

Colors

Incandescent

Text only?

NO, but graphics not used

How were the messages developed?

Engineering experience

Advances for the future

New building for the TMC in the next couple of years; fiber optics for a Shared Resources Program; video image processing

Private sector involvement?

Very little besides the TransCal project

Feedback from the users

No formal survey, but positive feedback from the users

Major operational problems?

No major problems

Contact Person:

Brian Simi
(916) 445-0059

Year the center opened: 1990

SAN DIEGO TRANSPORTATION MANAGEMENT CENTER
San Diego, California

Variable Message Signs

21 VMS and 23 portable VMS; mobile on 3/4 ton trucks and trailers, or else permanent fixed base installations; used in advance of major freeway junctions to warn motorists of unusual traffic congestion ahead or in advance of the end of a queue of vehicles; may indicate the route number that is experiencing the problem, cause of the problem, the condition of the route (e.g., a long delay), and possibly the location

Highway Advisory Radio

5 HAR; either mobile on a trailer or else permanent fixed locations; the mobile unit is capable of transmitting on 1610 or 530Kc; information provided on alternative parking lots and shuttle buses; 530Kc can reach 1 or 2 miles; motorists are advised to turn to 530Kc by temporary signs along the approach routes

Cable Television

Planned for the future

Personal Computer/ Modem

Traffic reports broadcast on the Internet at the following address: Maxwell Home Page http://www.scubed.com or http://www.scubed.com/caltrans/sd/big_map.shtml; experiencing about 20,000+ pages viewed per day (almost 157,000 per month for the San Diego traffic information screens); the TMC San Diego Ramp Metering System (SDRMS) is supplying about 5 million units of raw data per day (over a T-1 dedicated line) which is being formatted by Maxwell Labs software to create the screens for the Internet; the screens closely replicate the TMC SDRMS screens

Information Kiosks

NONE; planned installation in the future

Telephone

Receive information from various sources by telephone; communicate with the field VMS truck units by cellular phone, pager, and/or by radio; information given to the electronic and print media; Multiple ports on the back of the SDRMS computer which in some cases are connected by dedicated phone lines to traffic reporting services. This gives the traffic reporting services the data screens seen in the TMC which show planned lane closures, lane speeds and volumes, and incidents. The TMC staff inputs information on the California Highway Information Network (CHIN) regarding incidents and lane closures. The public can access a particular route(s) by pressing the number of the route on a touch tone phone; 1-800-427-7623 (in state) or 916-445-7623 (out of state)

SAN DIEGO TRANSPORTATION MANAGEMENT CENTER
San Diego, California

Others

Use pagers and faxes, cellular phones, standard phones, Caltrans two-way radios, California Highway Patrol (CHP) radios (receive only for monitoring; Co-location with CHP - a CHP officer works in the TMC using the CHP computer aided dispatch (CAD), the officer handles a majority of the SDRMS tasks for incidents, does live traffic report broadcasts, issues SIGALERTS (special radio frequency used to notify other command/dispatch centers of serious disruptions of traffic due to major incidents), handles media calls, sends out news releases, and handles law enforcement questions; also use the PC based LACC Bulletin Board (CHP software) to communicate with other statewide TMCs and commercial radio stations in Los Angels to advise of major traffic blockages

Formal Evaluation?

Statistics are being kept on the number of incidents, types of incidents, response times, length of facility closures, number of lanes affected, volume profiles, speed profiles, etc. Comparisons of "normal" vs. "incident" traffic flows are able to be developed from SDRMS. Additional work on analytical methods is underway

PHONE INTERVIEW

Most effective strategy

Commercial broadcast radio - provides updated traffic conditions every 10 minutes during the peak periods

Least effective strategy

HAR - since it is very time consuming to update the HAR unit compared to other methods of getting the message out, and it requires motorists to tune to a station to which they are not normally listening; the coverage area by HAR is significantly smaller compared to the coverage by the commercial radio stations

How current are the messages?

Very current, for the most part are near real-time especially on speed, volume, and incident screens; and on the fixed and mobile (truck mounted) VMS; commercial radio traffic reporters keep up very well during peak hours with a desire for accuracy and creditability

VMS MESSAGE CHARACTERISTICS

Length

3 lines, 18 characters

Colors

Incandescent with black background or flip disk on a black background

Text only?

YES

How were the messages developed?

Based on engineering judgement and experience

Advances for the future

New base-isolated building for the TMC expected to be opened by July 1996; this will be a collated facility which will bring together the regional 911 cellular call takers, dispatchers, public affairs and media officers, etc of the CHP Border Division; and the maintenance and construction dispatchers, operations transportation management staff, and emergency response staff, from Caltrans District 111, into one facility; these units are presently scattered over a 10-mile area of metropolitan San Diego

SAN DIEGO TRANSPORTATION MANAGEMENT CENTER
San Diego, California

Private sector involvement?   Extensive involvement in the development of software and hardware

Feedback from the users   Received very positive feedback from the Internet users and the traffic reporters when a message was sent out asking if they used the system; large number of inquiries from the media by phone and by Internet users

Major operational problems?   HAR - signal in some areas is wiped out by stronger commercial stations and other HAR stations; old equipment that takes a limited closed-loop tape (short message) or takes 20-30 minutes to update the messages remotely; Problems with fixing and developing the software required by the system

Contact Person: Tarbell C. Martin
(619) 688-3104
E-mail: tbtbell@trn.ts9.teale.ca.gov

Year the center opened: 1993

COLORADO TRAFFIC OPERATIONS CENTER
Lakewood, Colorado

Variable Message Signs	27 signs operating; various types - flip-fiber, flip-disc, and LED; display road and weather information along with any incident, road closure, incident that will impact traffic; messages come from the TOC and are pre-stored
Highway Advisory Radio	12 in operation using 530 HZ; used for messages on road and weather conditions, incidents or other things that impact traffic; monopole style; most messages are cellular phoned in to the unit as needed now; a central computer unit is being installed where canned messages may be used
Cable Television	NONE; trying to set up a system for the "Traffic Channel" for road conditions
Personal Computer/ Modem	N/A
Information Kiosks	NONE; ready to deploy 1 or 2 in January 1996; expand to 12 in 1996 if it works; will provide statewide road and weather conditions along with local information and likely advertising as part of the public/private partnership
Telephone	Menu-driven voice messaging system for statewide road and weather information; provides messages for 8 areas of the state on 50 phone lines simultaneously; does broadcast faxing, 16 at a time, to media, ski areas, ports-of-entry, commercial trucking firms, police, fire departments, and others
Others	Spot radio bits on incidents, are working with 4 television stations to share CCTV's and get pictures of conditions out to viewers; will be installing a television station camera in the TOC for stand-up spots
Formal Evaluation?	NO, but one is planned for the future

PHONE INTERVIEW

Most effective strategy	VMS since it is visual and should only be used when necessary or else people will become oblivious to the messages if messages are displayed constantly
Least effective strategy	Traffic information that is sent to the media since there is no guarantee what the media will do with the information
How current are the messages?	Real-time

VMS MESSAGE CHARACTERISTICS

Length	10 Flip-fiber signs - 3 lines of 18 characters, 18" letters; 6 Flip-disc signs (out-to-bid for flip-fiber or fiber-shutter) - 3 lines of 20 characters, 18" letters; 10 portable LED signs - 3 lines of 8 characters, 18" letters; 1 LED sign uses 3 lines of 8 characters, 12" letters; 8 of the portable LED signs are out-to-bid for fiber-shutter or flip-fiber signs of 3 lines of 15 characters, 18" letters
Colors	Amber
Text only?	YES

COLORADO TRAFFIC OPERATIONS CENTER
Lakewood, Colorado

How were the messages developed?

Traffic engineering experience; also the maintenance staff out in the field provided information which they obtained from the users

Advances for the future

More expert systems; also want to set up the system so that all the equipment operates on a single platform (currently VMS from different companies run on different programs)

Private sector involvement?

YES, just beginning to work with the private sector; jointly working with a television station to install cameras; private firms are developing software for the center

Feedback from the users

Surveyed the 250 agencies that the center faxes traffic information; received positive feedback

Major operational problems?

Some bugs with the new voice messaging system

Contact Person:

Lawrence Corcoran
(303) 239-5807

Year the center opened: 1994

NEWINGTON OPERATIONS CENTER
Newington, Connecticut

Variable Message Signs	31 flip-cube; 40 LED; full matrix; centrally controlled; provide information on daily construction, maintenance, incident management, and weather advisories
Highway Advisory Radio	Operational test project underway to deploy HAR along a section of Interstate 95 in Bridgeport
Cable Television	N/A
Personal Computer/ Modem	N/A
Information Kiosks	N/A
Telephone	ATIS study currently in progress for statewide area
Others	N/A
Formal Evaluation?	YES, for certain aspects of the operations center, but not for the entire center; before-and-after studies were completed for the traffic signal systems

PHONE INTERVIEW

Most effective strategy	VMS; ideally it would be VMS complimented with HAR
Least effective strategy	NONE, anything is better than nothing
How current are the messages?	Real-time, very effective

VMS MESSAGE CHARACTERISTICS

Length	Full matrix
Colors	Amber; capable of red and green, but not currently used
Text only?	NO; capable of graphics but not used
How were the messages developed?	Evolution process based on learning and practice since 1990
Advances for the future	ATIS provided for subscribers and users who dial-in to the system; fiber optics; satellite HAR; regional architecture for communications; new VMS; cellular telephone applications
Private sector involvement?	YES, the private sector operates the operations center in Bridgeport, Connecticut
Feedback from the users	NO formal surveys; the VMS Committee effectively addresses the issues
Major operational problems?	Multiple access to the computerized traffic signal system is a problem since the system was originally designed as a stand-alone system
Contact Person:	James Mona (860) 594-3450

Year the center opened: 1996

TRANSPORTATION MANAGEMENT CENTER
Daytona, Florida

Variable Message Signs	Traffic Info (hybrid flip / LED): 4 Vultron - full matrix; part of the I-4 / I-95 Daytona Surveillance System; centrally controlled that provides information during incident management and special events, such as Daytona 500; Flip Trailer Mounted VMS - 3, 3 line matrix controlled by cellular phone (these can be supplemented by bringing in additional trailer mounted VMS from other FDOT maintenance facilities during special events)
Highway Advisory Radio	Borrow trailer mounted HAR for special events - messages include bus shuttle locations and best routes to parking and/or into event location
Cable Television	None, checking into providing feed to county public cable access channel
Personal Computer/ Modem	N/A
Information Kiosks	N/A
Telephone	N/A
Others	N/A
Formal Evaluation?	N/A
PHONE INTERVIEW	SEE INTERVIEW FROM ORLANDO, FLORIDA
Contact Person:	Jon Cheney (904) 943-5322 E-mail: TO562JC@DOT1.MAIL.UFL.EDU

Year the center will open: End of 1996 (fully operational)

GOLDEN GLADES INTERCHANGE CONTROL CENTER
Miami, Florida

Variable Message Signs	10 under construction (LED, fiber optic, LED reflective, fiber optic reflective); 30 fiber optic proposed for I-95; local and central control; canned and composed messages; automatic, semi-automatic, and manual controls; congestion and delay information, diversion routes
Highway Advisory Radio	Proposed leaky coax is likely; taped messages; multi-modal traffic and travel information; congestion hot spots, diversion routes, transit schedules, fares, and connectivity, park and ride options, emergency bulletins, and airport and seaport connections
Cable Television	Being discussed; channel has been offered by the county; provide information similar to HAR; method of updating - initially relaying the information similar to that on HAR, but live segments on "Transportation/ITS Education" are being considered
Personal Computer/ Modem	System capable of providing the information to PCS is under design
Information Kiosks	Planned; information similar to HAR; in addition "individual" connectivity
Telephone	System capable of providing the travel/traffic information via telephone is under design; information similar to HAR
Others	Print, Commercial, TV media; announcement of planned construction activities and closures, etc as it is commonly done
Formal Evaluation?	Too early to comment; a project is planned to find the effectiveness of the type of VMS technology
PHONE INTERVIEW	N/A
VMS MESSAGE CHARACTERISTICS	
Length	3 lines, 21 characters per line
Colors	Amber, LED on black, white fiber optic on black
Text only?	NO, full matrix
Advances for the future	To be expanded in 1997-98; will cover 17.5 miles of I-95 in Dade County
Private sector involvement?	NONE
Contact Person:	Dr. Arvind Kumbhojkar (305) 470-5341

Year the center opened: 1991

I-4 FREEWAY MANAGEMENT CENTER
Orlando, Florida

Variable Message Signs

Traffic Info (hybrid flip/LED) under central control: Vultron - 4, 3 line matrix and 12 full matrix; Ramp Destination (flip white on green): 2 Vultron - 2 line matrix; Supplemental Destination (flip white on green): 4 Lake - 3 line matrix under remote control

Highway Advisory Radio

Future corridor - US 441 to US 192: leaky coax, taped messages, current traffic information; Traffic Info Radio Network (TIRN): private firm hoping to partner with FDOT to provide tourist and traffic information; traffic information 30 second spot every 20 minutes and/or live if major incident; currently being handled by Public Information Personnel

Cable Television

NONE currently; preliminary talks with television networks to have video feeds from I-4 Surveillance System

Personal Computer/ Modem

NONE currently; will evaluate home page for Internet during ITS Early Deployment Planning Study

Information Kiosks

NONE currently

Telephone

NO current 1-800 number on traffic or construction activities

Others

Metro Traffic Radio Report - operators consistently feeding information on traffic conditions along I-4 to private traffic radio network; Metro Traffic provides information to operators for incidents outside of the region

Formal Evaluation?

Consultant evaluated existing technology and previous experience with flip/fiber VMSs which led to discussion to use hybrid flip / LED; will be conducting a survey as part of the ITS EDP study to determine message effectiveness; HAR - consultants evaluated the existing technology and also considered public/private partnership and FHWA regulations

PHONE INTERVIEW

Most effective strategy

Partnering with Metro traffic radio since they can supplement VMS messages; also since they feed information to 20 different radio stations

Least effective strategy

Not really a worst feature, but HAR is the least marketable since studies have shown only about 8% to 10% of the people would change their radio channels to listen to a report

How current are the messages?

Real-time

VMS MESSAGE CHARACTERISTICS

Capable of using different fonts on the VMS

Length

3 lines - problem, location, and minute(s) of delay or lane(s) closed/open

Colors

Yellow amber high intensity LED; Yellow / Black; supplemental / ramp destination signs - white/green

Text only?

NO, capable of a limited number of special characters; the full matrix allows for graphics by using the manufacturer's software, but not currently used. May use it during the Olympics

I-4 FREEWAY MANAGEMENT CENTER
Orlando, Florida

How were the messages developed?

FHWA reports used and the NTIS, VMS Guidelines handbook June 1992 edition used to develop the messages

Advances for the future

Extend the surveillance system past the current 39 miles; Multimodal Master Plan in development; additional VMS; HAR; Time Warner Interactive Television; Internet; continue discussions with television networks and county public television access channels

Private sector involvement?

YES, would like to increase the private sector involvement in the future either through public/private partnership with traveler information services or in the area of assisting CVO and tourist rental car fleet management

Feedback from the users

YES, but no formal survey; received a great deal of feedback from the users when the messages on the VMS were changed from using the common roadway names to the state road numbers; feedback also received from talk radio shows

Major operational problems?

Coordination of the system components, however, software interfaces are being developed to help alleviate this problem; currently a single operator must operate the 39 mile system

Contact Person:

Jon Cheney
(904) 943-5322
E-mail: TO562JC@DOT1.MAIL.UFL.EDU

Year the center opened: 1996

GEORGIA DOT ADVANCED TRANSPORTATION MANAGEMENT SYSTEM
Atlanta, Georgia
expected to be fully operational by summer 1996

Variable Message Signs

2 types - one for general freeway traffic, and one for HOV traffic; 41 total; shuttered fiber optic; display information about accidents, roadwork, stalls, debris, congestion, alternate rotes, and scheduled lane closures; messages are created automatically by ATMS system software, or in the case of an unusual situation, manually by an operator at the TMC

Highway Advisory Radio

12, 10 watt transmitter sites; messages similar to VMS' messages, except more detailed; messages created automatically by the ATMS system software or else manually at the TMC; motorists are advised to listen to the HAR by static signs located along the freeway (white letters on blue background); in the event of a serious traffic emergency, flashing yellow beacons illuminate, warning drivers of a special traffic advisory

Cable Television

Still in the planning phase; would like to make available live traffic video, graphical displays of freeway conditions, and listings of ongoing incidents

Personal Computer/ Modem

Will provide a Bulletin Board System (BBS) for accessing information on local traffic conditions; initially only textual information; details that will be included about each incident will be: the roadway of occurrence, the location, the nature of the incident, the time of occurrence, and a suggested alternate route, if appropriate; 24 modems will make up the system initially; in the future, the system will expand to more modems and more information, including possible geographical maps of freeway conditions and video

Information Kiosks

100+ kiosks throughout the metropolitan area; kiosk server located at the GeorgiaNet offices, will be connected to the TMC via a T1 line; the kiosk server will process ATMS data and distribute it to all the kiosks; will be located in high-traffic locations such as transit stations, stadiums, malls, and airports; will provide traffic information, transportation mode information, points of interest information, and special event information

Telephone

Traffic Advisory Telephone System (TATS); provides callers with information about a particular route of choice; selections made using the keypad; information provided includes accident and congestion locations, roadwork and alternate routes, if available; users of the service will also be able to request a live operator if desired (to report an incident, for instance)

Others

N/A

Formal Evaluation?

None, since center still under construction

GEORGIA DOT ADVANCED TRANSPORTATION MANAGEMENT SYSTEM
Atlanta, Georgia
expected to be fully operational by summer 1996

PHONE INTERVIEW   N/A

VMS MESSAGE CHARACTERISTICS

Length   3 lines of text; 21 characters per line for the general freeway traffic VMS and 10 characters per line for the HOV VMS

Text only?   NO, 2 VMS will be full-matrix signs capable of displaying graphics such as arrows and symbols

Contact Person: Jim Hullett   OR   Mark Demidovich
                                        (404) 624-7814   (404) 624-7817

Year the center opened: 1986

HONOLULU TRAFFIC MANAGEMENT CENTER
Honolulu, Hawaii
Primary function is signal control

Variable Message Signs	NONE, but present designs are calling for VMS
Highway Advisory Radio	NONE, currently local radio stations carry traffic alerts
Cable Television	Presently setting up a traffic channel although local stations run traffic videos during peak hours
Personal Computer/ Modem	Some ongoing discussion
Information Kiosks	Planning to implement in 1996-1997
Telephone	NONE
Others	Honolulu is currently developing long-term plans to provide traffic information
Formal Evaluation?	What traffic information should be disseminated and consider the need, accuracy, significance, and speed and conveyance to public users
PHONE INTERVIEW	N/A
Contact Person:	Don Hamada (808) 527-5004

Year the center opened: 1961 (surveillance began)

TRAFFIC SYSTEMS CENTER
Oak Park, Illinois

Variable Message Signs

20 VMS; centrally controlled, automatic, and manual input; real-time traffic conditions; fiber optic enhanced, flip-disc displays

Highway Advisory Radio

11 on/near freeway broadcast antennae @ 530/1610 kHZ, using digitized voice for auto-updated travel time and congestion limits reports and taped voice for roadwork/incident messaging

Cable Television

1 minute auto-updated freeway condition color graphics map/audio provided on 1 channel of NW suburban cable carrier

Personal Computer/ Modem

A dial-up/leased-link network comprising commercial media, public agencies, state police, academia and the Internet accesses computerized freeway travel time and congestion information including incident and public transit bulletins

Information Kiosks

Planned for future use - real-time graphics of freeway condition and travel time information as part of the Gary/Chicago/Milwaukee ITS Priority Corridor

Telephone

A Call Distribution System is operated providing travel information similar to HAR

Others

Pager Service - a private enterprise using the TMC's media network RO feed provides freeway condition and travel time information to its customers subscribing to its customized services over the cellular network

Formal Evaluation?

PHONE INTERVIEW

N/A

Contact Person:

Tony Cioffi
(708) 524-2145

Year the center opened: 1982

TRAFFIC MANAGEMENT CENTER
Lexington, Kentucky

Variable Message Signs	N/A
Highway Advisory Radio	N/A
Cable Television	N/A
Personal Computer/ Modem	N/A
Information Kiosks	Being considered
Telephone	Traffic Hot Line provides up-to-date traffic conditions during the peak driving periods; the Traffic Information Network recently added a *311 number which provides a toll-free call for motorists with cellular telephones to access the most recent traffic information
	Also use the telephone to control the video surveillance pan, tilt, and zoom; the local cable services data line may be used to control the cameras pan, tilt and zoom in the near future
	Uses voice grade telephone lines to bring back video from remote sites that the local cable company can not reach; this video is presented at a rate of 10 frames per second whereas regular video is 30 frames per second - it is still very useful for incident management activities
	Telephone lines are used for communication with the approximately 300 traffic signals in Fayette County; each second a coded command is sent and a coded response received to each of these signals to provide real-time control
Others	Fax - traffic information faxed to 16 radio stations and 4 television stations during the morning and afternoon peak driving times
Formal Evaluation?	YES for the incident management program - a study to analyze the efficiency of the program

PHONE INTERVIEW

Most effective strategy	Media - the TMC faxes real-time traffic information to 16 radio stations and 4 televisions stations
Least effective strategy	HAR possibly
How current are the messages?	Real-time
VMS MESSAGE CHARACTERISTICS	Not Applicable since the center does not directly operate the signs, the center only requests that messages be displayed on the signs when appropriate
Length	N/A
Colors	N/A
Text only?	N/A

TRAFFIC MANAGEMENT CENTER
Lexington, Kentucky

How were the messages developed?   N/A

Advances for the future   Fog and ice detection; Level of Service and speeds in a graphic format on a cable television station; information kiosks; develop a page on the Internet

Private sector involvement?   YES, local cellular telephone company provides a *311 number; Local telephone company provides the communication links between the center and the traffic signals; Local cable company links the cameras to the center

Feedback from the users   No formal surveys, but have received positive feedback through call-ins; The media likes the system, and depends on the system so that they can provide real-time traffic information

Major operational problems?   NO

Contact Person: Ron Herrington
(606) 258-3480

Year the center opened: 1995

STATEWIDE OPERATIONS CENTER / CHART OPERATIONS
Hanover, Maryland

Variable Message Signs	48 existing VMS - flipped disc with fiber optic and rotating drums; central and manual control; fixed and composed messages; 30 additional VMS planned for the future; portables used extensively
Traveler Advisory Radio (TAR)	25 existing TAR - monopole, frequencies 530, 1210, 1290, and 1610 AM; live and taped messages; 7 additional planned for the future; portables augment incidents and special events
Cable Television (CCTV)	21 existing fixed camera sites
Personal Computer/ Modem	TRAVIEW on-line graphics
Information Kiosks	NONE, 8 planned for the future
Telephone	1-800 Public Affairs Numbers
Others	Broadcast fax and alpha pager connectivity to Metro Traffic (METRO & SHADOW Traffic) in Washington and Baltimore
Formal Evaluation?	Currently being developed

PHONE INTERVIEW

Most effective strategy	Multi-agency coordination and teaming
Least effective strategy	TAR - AM frequencies are primary limitation
How current are the messages?	Real-time - regular updates as the situation changes

VMS MESSAGE CHARACTERISTICS

Length	Typical 21 characters, 3 lines, 2 pages
Colors	Amber / Yellow
Text only?	Yes
How were the messages developed?	Scripted for incidents; library for regular messages
Advances for the future	Work hand-in-hand with public affairs
Private sector involvement?	Consultant services / resource sharing
Feedback from the users	Northeast Corridor I-95 coalition
Major operational problems?	Software integration - state procurement limited flexibility
Contact Person:	Lee McMichael (410) 582-5605 E-mail: HTTP://WWW.INFORM.UMD.EDU/UMS+STATE/MD_RESOURCES/MDOT

Year the center opened: 1986

MONTGOMERY COUNTY TMC
Rockville, Maryland

Variable Message Signs	Planned for 1996 - 1997; will provide route guidance and parking information
Highway Advisory Radio	12 sites, all synchronized computerized operation; sites are interconnected
Cable Television	Daily broadcasts on cable television (video, text, graphics)
Personal Computer/ Modem	Web site on-line in spring 1996
Information Kiosks	Design stage; testing spring and summer 1996
Telephone	Transit information center plan to use a voice recognition system instead of a touch-tone system
Others	Direct connection to ABC, CBS,. NBC, FOX, and News Cable 8 in Washington, D.C.; Transportation Information Network 1996
Formal Evaluation?	Will do an evaluation when a more complete system is brought on-line

PHONE INTERVIEW

Most effective strategy	HAR if it is set-up properly with a dedicated station and enough wattage to power the system; also cable television and the Internet
Least effective strategy	VMS since the impacts that they have can not justify the high cost of implementing
How current are the messages?	N/A - VMS still in the planning stage; will design based on the particular situation
VMS MESSAGE CHARACTERISTICS	N/A
Length	N/A
Colors	N/A
Text only?	N/A
How were the messages developed?	N/A
Advances for the future	Increase the information gathering capabilities; looking into applying machine vision; enhance video surveillance system
Private sector involvement?	YES, varies; very willing to work with others
Feedback from the users	NO formal surveys because of the cost issue
Major operational problems?	The system is continually enhanced; test new technologies at a smaller scale, and then only implement once they are sure the technology works, therefore eliminates failures
Contact Person:	Gene Donaldson (301) 217-2182 E-mail: GSD@MAILCENTER.DOT.CO.MONTGOMERY.MD.US

Year the center opened: 1991

MICHIGAN ITS CENTER
Detroit, Michigan

Variable Message Signs	14 flip-disc signs; with 43 additional planned for the future; information provided on accidents, construction, and freeway closures
Highway Advisory Radio	Planned
Cable Television	N/A
Personal Computer/ Modem	N/A
Information Kiosks	N/A
Telephone	Planned
Others	N/A
Formal Evaluation?	NO

PHONE INTERVIEW

Most effective strategy	VMS since it can be used on a point-by-point basis
Least effective strategy	Only limited information can be provided by the VMS
How current are the messages?	Depends on how quickly the information is received

VMS MESSAGE CHARACTERISTICS

Length	3 lines, 18 characters
Colors	Yellow
Text only?	NO, capable of graphics but not used
How were the messages developed?	Policy was followed to develop the messages
Advances for the future	43 LED signs
Private sector involvement?	NO
Feedback from the users	Occasional call in, but no formal survey
Major operational problems?	NO
Contact Person:	Ross Bremer (313) 256-9800

Year the center opened: 1972

MN/DOT TRAFFIC MANAGEMENT CENTER
Minneapolis, Minnesota

Variable Message Signs	49 rotating drum (6-sided) type operational; currently installing 1 amber LED type and 7 more scheduled
Highway Advisory Radio	Radio traffic information on KBEM 88.5 FM throughout the metro area via a partnership with Minneapolis Public School System; broadcasts originate from the TMC Control Room from 6 to 9 AM and 3 to 7 PM weekdays; 2 to 3 minute traffic updates are presented every 10 minutes, when a major incident occurs, traffic information is broadcast continuously; include information on lane closures, road surface conditions, incident types and locations, anticipated delays, and recommendations on alternate routes; a few 10 watt HAR systems are used in support of construction or maintenance work zones
Cable Television	Been in operation for several years; available in several southwestern suburbs; goal to make it available on all television sets in the metro area; information telecasted include lane closures, incidents, graphics showing link speeds, and live CCTV coverage from any of the 160 cameras located along metro area freeways
Personal Computer/ Modem	In the process of developing; format similar to the cable television traffic channel
Information Kiosks	N/A
Telephone	Analyzing alternatives for the best system to provide the information
Others	2 operational tests evaluating innovative traffic information services; "Trilogy" is an operational test of vehicle dashboard displays and other methods for providing real-time traffic information to travelers en route; a range of user devices with varying capabilities will provide the end users with route-specific advisories on traffic conditions in the metro area; The "Genesis" project will provide end users with traffic information via hand held personal communication devices
Formal Evaluation?	Includes market research to determine usage, understanding, and attitude towards the various initiatives. In addition to the market research, the traffic information systems will be evaluated (in combination with the other traffic management initiatives) by measuring reductions in congestion and accidents; hard to evaluate since one initiative can not be singled out over another

PHONE INTERVIEW

Most effective strategy	Radio Station KBEM 88.5 FM - market research says that people like it; everyone has a radio; information is provided free of charge by the private sector; NOT a HAR (10 watt)
Least effective strategy	Kiosks- very few people use them since they are only available in buildings
How current are the messages?	Continuously

MN/DOT TRAFFIC MANAGEMENT CENTER
Minneapolis, Minnesota

VMS MESSAGE CHARACTERISTICS

Length	3 lines, 18 characters
Colors	Yellow on black and amber on black
Text only?	YES
How were the messages developed?	Messages were developed based on experience, market research, and nationwide studies
Advances for the future	Improve the cable television graphics; the "Trilogy" project; Internet; portable communication systems; provide telephone call-in services
Private sector involvement?	YES, partnerships with radio stations; operational test, "Trilogy", is partnership with Volvo
Feedback from the users	YES, surveys
Major operational problems?	NO major problems, just need time to upgrade the cable television graphics
Contact Person:	Glen Carlson (612) 341-7500

Year the center opened: 1984

LAS VEGAS AREA COMPUTER TRAFFIC SYSTEM (LVACTS)
Las Vegas, Nevada

Variable Message Signs	Proposed as part of an ITS feasibility study for the area
Highway Advisory Radio	Being considered as part of the ITS early deployment study
Cable Television	Being considered as part of the ITS early deployment study
Personal Computer/ Modem	Being considered as part of the ITS early deployment study
Information Kiosks	Being considered as part of the ITS early deployment study
Telephone	Information provided by console operator upon caller request; no organized or automated system now being used
Others	N/A
Formal Evaluation?	NONE at present
PHONE INTERVIEW	N/A
Contact Person:	Gerry de Camp (702) 229-6611

Year the center opened: 1986

TRANSCOM
Jersey City, New Jersey

Variable Message Signs	100+; variety of VMS types used; all are owned and operated by TRANSCOM agencies; construction, incident, and special event information provided
Highway Advisory Radio	TRANSCOM operates 2 systems on behalf of the member agencies and has access to 3 other systems; construction, incident, and special event information provided
Cable Television	Only used indirectly through media services
Personal Computer/ Modem	Weekly traffic and transit advisory is available via a dial-up bulletin board system to a small group of users
Information Kiosks	Service Area Transportation Interactive Network (SATIN) is being developed
Telephone	Primary device used to share information among agencies on incident and construction
Others	Fax, media, pagers
Formal Evaluation?	NO formal evaluation methods; agency satisfaction and significant diversion is the primary measure; difficult to isolate the impact of individual strategies since a variety are used in most cases

PHONE INTERVIEW

Most effective strategy	The number of agencies that TRANSCOM can reach - 3 states and 100+ agencies
Least effective strategy	Each dissemination device has inherent advantages and disadvantages. The challenge is to know which systems to use based on the information you wish to communicate and who needs the information.
How current are the messages?	Varies; HAR is updated whenever there is a significant change in the status of an incident, or hourly when no significant change has taken place
VMS MESSAGE CHARACTERISTICS	Not Applicable since TRANSCOM does not actually operate the VMS
Length	N/A
Colors	N/A
Text only?	N/A
How were the messages developed?	N/A
Advances for the future	N/A
Private sector involvement?	Yes; traffic reporting services and the media provide information
Feedback from the users	YES

TRANSCOM
Jersey City, New Jersey

Major operational problems?

TRANSCOM in most cases does not directly communicate with the public and problems can sometimes occur when information from TRANSCOM is forwarded incorrectly to the ultimate recipient

Contact Person:

Bernie Wagenblast
(201) 963-4033
E-mail: I95BERNIE@AOL.COM

Year the center opened: 1976

NEW JERSEY TURNPIKE AUTHORITY'S TRAFFIC OPERATIONS CENTER
New Brunswick, New Jersey

Variable Message Signs	1 VMS presently; 19 additional VMS planned for the future; traffic congestion and regional diversion messages provided
Highway Advisory Radio	11 sites; updated 24 hours/day with Turnpike and regional traffic information
Cable Television	N/A
Personal Computer/ Modem	N/A
Information Kiosks	N/A
Telephone	1-800-336-5875 Highway Advisory Telephone with access to recorded messages which are updated 24 hours/day on 3 sections of the Turnpike, South, Central, and North with a fourth option for information on special events and long term construction projects.
Others	N/A
Formal Evaluation?	NO
PHONE INTERVIEW	
Most effective strategy	HAR since have several sites; 9 fixed sites and 2 portable sites
Least effective strategy	VMS limited since only have 1 sign
How current are the messages?	Very timely, would give an overall rating of a B+
VMS MESSAGE CHARACTERISTICS	
Length	3 lines, 20 characters
Colors	red LED
Text only?	YES
How were the messages developed?	Traffic engineers based design of messages on familiarity of motorists' knowledge
Advances for the future	Amber LED; communications to signs will be updated
Private sector involvement?	Somewhat
Feedback from the users	Positive; no formal survey
Major operational problems?	HAR's maintainability
Contact Person:	Robert Dale (908) 247-0900 ext. 5401

Year the center opened: 1987

INFORM
Long Island, New York

Variable Message Signs
101 flip disc fiber optic enhanced; under central control; messages post both manually and automatically

Highway Advisory Radio
3 installations planned

Cable Television
1 cable television station uses INFORM's computer generated map and INFORM's live video via a microwave link

Personal Computer/ Modem
Visual Traffic Information Project (VTIP) map of Long Island will shows speeds and text about traffic conditions

Information Kiosks
VTIP terminals will be at New York State Office Building, shopping mall, and others

Telephone
1-800-ROADWORK gives construction information

Others
Fax, commercial radio

Formal Evaluation?
Yes, performed by JHK & Associates a few years ago

PHONE INTERVIEW

Most effective strategy
VMS since motorists will hopefully not miss them; does not require that the motorists seek for the information through the radio, computer, etc.

Least effective strategy
Internet - believes that it is good to have it available, but does not believe that too many people are going to use it

How current are the messages?
Real-time; traffic is monitored 24 hours/day and messages are continually updated

VMS MESSAGE CHARACTERISTICS

Length
3 lines, 16 characters typically

Colors
Amber

Text only?
YES

How were the messages developed?
Existing research and experience

Advances for the future
Video surveillance system that uses neural network technologies which enable the CCTVs to automatically judge the speed and volume of the vehicles

Private sector involvement?
Somewhat through experimentation projects

Feedback from the users
YES, the JHK evaluation

Major operational problems?
Recently there are some design problems with the VMS since they are changing the technology from flip disc to fiber optic enhanced

Contact Person:
Joe Contegni
(516) 952-6781

Year the center opened: 1973

TRANSPORTATION MANAGEMENT CENTER
Columbus, Ohio

Variable Message Signs	4 VMS out for bid - 2 LED, 2 LED/flip disc hybrid; 35 VMS - ultimate build-out; fully programmable from the operator's workstation; ability to select pre-programmed messages subject to timeouts (messages will be displayed for specific time periods then the operators will be notified) from other workstations in police radio room and suburban communities
Highway Advisory Radio	N/A
Cable Television	Video feeds go to the commercial television stations and the community cable channel; using video since 1974
Personal Computer/ Modem	NONE, planned for the immediate future; local Freenet is too difficult to access at peak times and maintaining a bulletin board is too expensive
Information Kiosks	One will be installed as a prototype in a city-owned building; when more of the system is instrumented, anticipating interactive kiosk installation in the interstate rest areas approaching the metro area in cooperation with ODOT and the Ohio Department of Development
Telephone	NONE, considered for the future; labor intensive operation and expensive if contracted
Others	Commercial Radio Station Traffic Reporters; good relationship with the commercial radio stations; 1 full time and 1 peak hour traffic reporter for 2 different stations currently work in the TMC; fastest and most effective method currently installed of getting information out to the motorists
Formal Evaluation?	Construction management group (Paving the Way....) Conducts an annual customer satisfaction survey and focus group session. These will be expanded to include the above information distribution strategies

PHONE INTERVIEW

Most effective strategy	Radio traffic reporters since they inform the motorists directly in their vehicles
Least effective strategy	Printed material / public media since not timely
How current are the messages?	Real-time

VMS MESSAGE CHARACTERISTICS

Length	8 characters, 3 lines
Colors	Yellow/Green and Amber
Text only?	YES
How were the messages developed?	General philosophy followed

TRANSPORTATION MANAGEMENT CENTER
Columbus, Ohio

Advances for the future	Wide traffic surveillance; integrate the freeway management system with the traffic signal system; more VMS, ramp metering, CCTV
Private sector involvement?	NO
Feedback from the users	Formal surveys by the construction management group
Major operational problems?	To detect incidents real-time, but the issue is being addressed
Contact Person:	Richard McGuinness (614) 645-7792

Year the center will open: 1996

TRANSPORTATION MANAGEMENT OPERATIONS CENTER
Portland, Oregon

Variable Message Signs	3 operating; 6 under construction; 3 additional signs planned; flip disc type; road information provided - closures, weather, construction, and detours
Highway Advisory Radio	Planning to install one within the next 2 years; 2 additional ones planned; information similar to the VMS information
Cable Television	Planning to install a system of CCTVs using cable company lines; possibly will release the pictures to the public
Personal Computer/ Modem	Will be implemented in the near future
Information Kiosks	Will be implemented in the distant future
Telephone	3 types: Statewide Road Conditions - weather and construction; recorded message; Portland Road Condition - recorded message; Portland Area-Public Reporting Number - allows people to call in problems
Others	Information is coordinated and shared with a metropolitan traffic reporting group
Formal Evaluation?	No formal evaluation program but will have one once the system is further along in operation

PHONE INTERVIEW

Most effective strategy	Satisfied with most of the equipment
Least effective strategy	Communication links between the telephone system; sometimes sporadic
How current are the messages?	Varies; at least daily

VMS MESSAGE CHARACTERISTICS

Length	2 lines, 18 Characters
Colors	Amber and yellow on black
Text only?	NO, the newer signs have graphic capabilities
How were the messages developed?	Combination of policy and public awareness campaign; through the campaign they asked motorists if they did not understand the messages to call in
Advances for the future	CCTV for better detection and count information; Remote pick-up for data collection by computer/modem in order to more efficiently use the work hours
Private sector involvement?	Mixture; there is a 3-way agreement between the State of Oregon, City of Portland, and the Oregon Arena Corporation
Feedback from the users	Rely on call-ins; however a formal survey is planned in the next year to year and a half
Major operational problems?	Communication links between the telephone system; compatibility between the computer systems and programs
Contact Person:	Dorothy Upton (503) 731-8205

Year the center opened: 1993

PennDOT DISTRICT 6-0 TRAFFIC CONTROL CENTER
St. Davids, Pennsylvania

Variable Message Signs

4 VMS (2 LED and 2 fiber optic and shutter technology) are being used as part of the I-95 Traffic and Incident Management System that was deployed along a 12-mile stretch of Interstate 95 in the Philadelphia area by PennDOT Engineering District 6-0; locally and remotely controlled; manually operated; fixed and composed messages are used; incorporate automatic call back feature for enhanced security during log-in

Highway Advisory Radio

NONE; proposed for the future

Cable Television

NONE; possibility in the future

Personal Computer/ Modem

NONE; possibility in the future

Information Kiosks

Proposed for Route 202 ITS project

Telephone

NONE; possibility in the future

Others

Traffic News Services (SHADOW, METRO) - Traffic Control Center provides up to the minute traffic information to the local new radio stations

Formal Evaluation?

Preliminary Agreement of Traffic and Incident Management Systems (TIMS) Benefits - a report dated May 3, 1995; qualitative and quantitative benefits of ITS operations in Philadelphia Year 1 (May 1995) and Year 2 (December 1995) Operations Reports - analysis of malfunction data of the last 2 years

PHONE INTERVIEW

Most effective strategy

Local news radio

Least effective strategy

HAR since studies show that the percentage of motorists who will tune to the station is low

How current are the messages?

Real-time

VMS MESSAGE CHARACTERISTICS

Length

3 lines, 18 characters

Colors

Amber

Text only?

NO, limited graphic capabilities

How were the messages developed?

Based on research, I-95 Corridor Coalition, and input from the Highway Patrol

Advances for the future

FHWA Demonstration Project - Satellite Project March 1996 - will compare Satellite communications with T1 telephone lines; Interstate 476 communications project - CCTV with T1 telephone lines and CCTV with fiber optic cables; 8 miles of loop detectors will send signals back to the control center via spread spectrum radio; Automated Vehicle Detection; 15 ramp meters will be installed

Private sector involvement?

Not very much

PennDOT DISTRICT 6-0 TRAFFIC CONTROL CENTER
St. Davids, Pennsylvania

Feedback from the users

Formal survey of the Highway Patrol, news media showed that they are very happy with the system and depend on VMS; I-95 Corridor Coalition surveyed the motorists

Major operational problems?

With new ITS technologies, making repairs has been a continuing learning experience; lack of adequate staffing; also need better coordination and cooperation between the road maintenance units and the control center

Contact Person:

Karl Ziemer
(610) 989-9326

Year the center opened: 1995

TRANSGUIDE
San Antonio, Texas

Variable Message Signs	52 currently installed and operating; 43 under contract to be installed; approximately 300 VMS in San Antonio and 500 VMS in the TransGuide South Central Region are planned for the future
Highway Advisory Radio	N/A
Cable Television	Purchased a low power television station to distribute video and digital data to numerous users within a 20 mile radius to TransGuide
Personal Computer/ Modem	Real time traffic data and technical documentation is available on Internet
Information Kiosks	The 4 channels of the low power television station are used to transmit data to the future kiosk within San Antonio; deployment of kiosks is estimated in 1997
Telephone	N/A
Others	N/A
Formal Evaluation?	YES, will evaluate accidents, congestion, etc. for a 6-month period before and after the system was implemented

PHONE INTERVIEW

Most effective strategy	VMS and cable television
Least effective strategy	HAR since no one listens to it
How current are the messages?	Updated every 20 seconds

VMS MESSAGE CHARACTERISTICS

Length	3 lines, 18 characters
Colors	Amber color only
Text only?	YES
How were the messages developed?	Used existing research material
Advances for the future	In-vehicle route guidance systems
Private sector involvement?	YES - heavily
Feedback from the users	YES, surveys
Major operational problems?	NO
Contact Person:	Patrick McGowan (210) 731-5247

Year the center opened: 1985

INTERSTATE 66 / INTERSTATE 395 TMS
Arlington, Virginia

Variable Message Signs	100 VMS flip disc operating; Additional 100 VMS will be installed within next 2 years - a combination of flip-LED and LED; The signs will be used to inform the motorists about congestion, incidents, road work and also regulatory messages
Highway Advisory Radio	None will be operated by the TMS; 3 or 4 are operated by the Traffic Operations Center in the Northern Virginia office
Cable Television	Provide traffic videos to all local stations and one cable station
Personal Computer/ Modem	Some ongoing discussion; Right now testing with a company to send traffic video through Internet; Later will transmit traffic data information as well
Information Kiosks	Planning
Telephone	None
Others	In planning stage use various means to send traffic data to the motorists such as the telephone, pagers, etc.
Formal Evaluation?	Was completed in 1985, 6 months after the system was implemented

PHONE INTERVIEW

Most effective strategy	VMS and traffic videos to television stations
Least effective strategy	Information to the traffic reporters
How current are the messages?	Update all the time

VMS MESSAGE CHARACTERISTICS

Length	12 to 22 characters, some 2 lines; most are 3 lines
Colors	flip disc - black and white; flip-LED - yellow disk and amber
Text only?	NO, capable of graphics
How were the messages developed?	Developed by consultant and added in accordance with new situations
Advances for the future	Re-design the TMS software, testing radar sensors, video detection system
Private sector involvement?	YES, will be a public/private partner operation
Feedback from the users	Phone call or mail; Would like to set up a survey; Also depend on input from a user group
Major operational problems?	No, too much need to upgrade the software
Contact Person:	Jimmy Chu (703) 521-5695

Year the center will open: Fall 1996 (Phase I of the full TMS)

VDOT SUFFOLK DISTRICT TMS CENTER
Virginia Beach, Virginia

Variable Message Signs

55 flipped disc type (central or local controlled); stored or composed messages; automatically controlled with manual override; used for point diversion, motorist advisory and reversible roadway control; 4 solar powered, cellular controlled, LED type display portable VMS used for incident management response

Highway Advisory Radio

9 in the area (2 covering Coleman Bridge maintained / controlled by TMS Center; 7 along I-64, Route 44 and Route 168 maintained / controlled by the Hampton Roads Bridge-Tunnel); system currently being reviewed to be replaced by August 1996 with 2 Wide-Area HAR Systems (one on the Peninsula and the other on the Southside); general traffic condition information and incident information as needed

Cable Television

Agreement under consideration with local cable company and area broadcast stations to initially multiplex 38 channels of raw CCTV video at the control center and then have those entities package and re-broadcast (actual delivery method and details still being worked out)

Personal Computer/ Modem

32 line dial-up BBS; users will be remote long-ins to Windows NT LAN System; initial users will be local agencies and media representatives; World Wide Web site under development; Graphical Roadway status map (statewide, regional, and local) / incident information / statewide construction project information types of information available on both systems

Information Kiosks

Prototype under development; plan to deploy at least 25 in Hampton Roads area by Summer 1997 (located @ malls, hotels, truck stops, bases, beaches, etc.); information will be inclusive of PC and Web site data along with general information on local sites of interest, calendar of events, ridesharing information, etc.

Telephone

InfoLine (Southside 804-640-5555 ext 7874)
OneLine (Peninsula 804-928-1111 ext 7623)
Touch-Tone dial -up traffic condition updates administered and updated by area tunnel/bridge personnel every 15-20 minutes

Others

Pager System - anticipate initiating agreements with local/regional pager system providers to distribute roadway incident information

Formal Evaluation?

PHONE INTERVIEW

N/A

VMS MESSAGE CHARACTERISTICS

Length

3 lines, 13 characters

Colors

Amber

Text only?

YES, graphics limited to arrows only

Contact Person:

Dwayne Cook
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Year the center opened: 1966 (surveillance began with I-5 construction; CCTV and express lane operation, ramp meters in 1981)

TRAFFIC SYSTEMS MANAGEMENT CENTER (TSMC)
Seattle, Washington

Variable Message Signs

42 VMS; 29 additional VMS planned for the future; display information on accidents, incidents, construction and maintenance activities, reversible lane status, traction device requirements, and public information (limited); types used include the "hybrid fiber optic flip disc, flip disc with LED, and some without lighting; the fiber optic flip disc type are used to put different operator composed messages on the signs (i.e. ACCIDENT AHEAD, FLAMMABLE RESTRICTION); control of the VMS are either central-manual (for the operator composed messages) or local-automatic (for the fixed messages)

Highway Advisory Radio

7 HAR transmitters and 19 HAR signs in use; 6 additional HAR transmitters and 14 additional HAR signs are planned for future use; used to provide information on construction/maintenance activities, and traffic incidents or conditions; monopole type and use the radio frequency 530 AM or 1610 AM; by telephone, operators can record and change messages on the HAR transmitters and can turn on the flashing beacons (which signal the motorists to tune to 530 AM or 1610 AM) on the HAR signs as needed; in the process of implementing continuous traffic reports on the region's HARs utilizing computer generated voice technology

Cable Television

Negotiations with local cities and cable television companies are underway to provide updated traffic information through local access television; one of the goals is to have TSMC's Flow Map, a graphical representation of real time traffic flow around the Seattle area, viewed through television; information on current traffic conditions, construction updates and closures, and access to view real time traffic with TSMC's closed circuit television cameras, are the goals of this strategy

Personal Computer/ Modem

Internet - "http://www.wsdot.wa.gov" - users can access WSDOT's home page to receive traffic information; on line users can view the Flow Map for updated traffic conditions, receive information on construction updates and closures, ferry and bus schedules, and future expansion of the roadway infrastructure; information updated automatically every 5 minutes; users can receive updated information more quickly, every 2 minutes, by reloading the home page;
Software program - free program available to businesses meeting a required employee or fleet size; currently 84 on line subscribers to the free software program; the program displays the Flow Map giving information on real time traffic conditions, and construction updates and closures; updated every 3 to 5 minutes; local traffic reporters use the free software program to receive information for their reports; also used by the information kiosks

TRAFFIC SYSTEMS MANAGEMENT CENTER (TSMC)
Seattle, Washington

Information Kiosks

3 kiosks currently in use that specifically provide freeway traffic information; the kiosks are interactive touch-screen computers equipped with the TSMC software program to display the Flow Map which provides information on real time highway traffic conditions, construction updates and road closures; several more kiosks are planned for the region integrating multiple sources of transportation information; the kiosks are/will be placed at locations such as airports, ferry terminals, shopping malls, large businesses, and other locations with high pedestrian traffic to provide traffic information to potential drivers

Telephone

The DOT-HIWY (206-368-4499) telephone line is updated every 10 minutes to provide callers information on incidents, traffic reports, special traffic advisories, and express lanes status; information on construction, ferry schedules, and transit and carpool can also be accessed through this telephone line; callers using a cellular phone in the local area can access the phone line free of charge with a #800 number (this service is provided through a public/private partnership); for commuters outside the local area, the DOT-HIWY line can be reached toll free through a 1-800-695-ROAD (only accessible within Washington state) number

Others

N/A

Formal Evaluation?

SURVEYS - are performed to indicate how effective motorists felt the equipment was providing traffic information; questions on how often motorists tuned to 530 AM to listen to the HAR transmitter, or if they felt the information given to them on a VMS was important, and addressed
DIRECT CONTACT - direct response from the on-line users of WSDOT's software program is done on a daily basis; more specifically, local traffic reporters keep in contact with the flow operators of the TSMC to verify information given on the Flow Map   PHONE LINE - available for people to call and request information regarding the WSDOT's highway; information on the equipment used by the TSMC (VMS, HAR, Phone lines, etc.) can also be gathered through this line
EQUIPMENT FREQUENCY LINE - daily count data for the DOT-HIWY line is available; the number of daily "hits" WSDOT's home page receives can be collected; some data is also available for the usage frequency of VMS and HAR equipment

PHONE INTERVIEW

Most effective strategy

Traffic information provided over the phone lines which allow the motorists to dial in; also the VMS since it is visual; Cable television information

Least effective strategy

Internet at the present time since only a limited number of people have computers in their homes, but this will be a growing area as more people become connected

How current are the messages?

Real-time for the most part; Traffic Flow Map every 2 minutes; Telephone and VMS messages are fairly current; HAR is constantly updated

TRAFFIC SYSTEMS MANAGEMENT CENTER (TSMC)
Seattle, Washington

VMS MESSAGE CHARACTERISTICS

Length

Varies; 2 lines of 22 characters, 18 characters, or 17 characters

Colors

Amber

Text only?

NO, some of the new signs have graphic capabilities

How were the messages developed?

Engineering experience; the messages are not that detailed since they are not used (except for bridge closures) to divert traffic to arterials

Advances for the future

Provide real-time traffic information on the HAR using a computer generated voice that is updated automatically by the computer which would collect data from the operators and then send out the appropriate messages; Also, snap shots from the cameras will be placed on the Internet

Private sector involvement?

YES, 3 of the 4 television stations have access (but no control) to the 180 surveillance cameras; Free software program which provides an updated traffic map is available to businesses; a cellular phone company provided the center with a free #800 number

Feedback from the users

Working towards a formal survey of the users through the State DOT and the Universities

Major operational problems?

Speciality maintenance is a problem since implementing new technologies, it is difficult to fix problems when they do occur; also resources are limited

Contact Person:

Amir Rasaie
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Year the center opened: 1994

MONITOR TRAFFIC OPERATIONS CENTER
Milwaukee, Wisconsin

Variable Message Signs	11 on freeways; 3 on surface streets; 6 additional for the future
Highway Advisory Radio	2 portable units being procured in 1996 will operate through central, integrated ATIS software
Cable Television	FTMS CCTV shown with local broadcast radio
Personal Computer/ Modem	Control center fax server will distribute ATIS information to media and others through automated scheduled by 1996
Information Kiosks	N/A
Telephone	N/A
Others	Other HAR - existing HAR for airport and stadium traffic will be adopted for ATIS applications
Formal Evaluation?	SE Wisconsin Incident Management (SWIM) program under development will evaluate incident related benefits (reduced delays/congestion, etc.) of ATIS strategies. Have completed some evaluation of ramp metering benefits. Hope to complete more qualitative ATIS and system user survey; view evaluation as important to show the users the value of implementing the system

PHONE INTERVIEW

Most effective strategy	Good feedback from the television stations on the information received from the CCTV; Ultimately think that VMS will be the best, but the signs are still in the implementation phase
Least effective strategy	NONE - believes that anything would be of benefit
How current are the messages?	Updated continuously (real-time); the VMS only display messages on an as needed basis (25% of the time), the rest of the time (75%) the signs are blank (no messages); the goal is to have the signs on 50% of the time

VMS MESSAGE CHARACTERISTICS

Length	3 lines, 17 characters
Colors	Amber on black
Text only?	NO, capable of graphics
How were the messages developed?	Messages developed based on consultant recommendations and by survey other states; evolving policy - the signs consist of the following 3 lines: problem, location, and action to take
Advances for the future	Test new signs; display travel time information and average travel speed information; expand the base system to full implementation
Private sector involvement?	Minimal but looking to work more with television stations and Metro Traffic
Feedback from the users	NO formal surveys due to funding problems

MONITOR TRAFFIC OPERATIONS CENTER
Milwaukee, Wisconsin

Major operational problems?	NO major problems besides the system is taking longer to implement than anticipated due to small problems such as "bugs" in the new software
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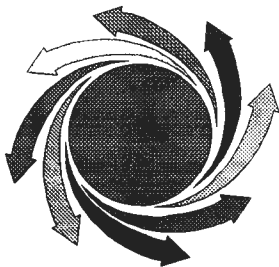
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