

**INTELLIGENT VEHICLE-HIGHWAY SYSTEMS (IVHS) ACTIVITIES
IN THE VIRGINIA DEPARTMENT OF TRANSPORTATION**

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(The opinions, findings, and conclusions expressed in this
report are those of the author and not necessarily
those of the sponsoring agencies.)

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INTRODUCTION

The Virginia Department of Transportation (VDOT) is committed to the development and deployment of IVHS to improve the safety and efficiency of the Commonwealth's multi-modal transportation system. The focus of the Department's activities is Virginia PROGRESS, an ambitious statewide IVHS program. VDOT has recently developed and published a strategic plan to guide Virginia PROGRESS.

Virginia PROGRESS is based on four areas critical to meeting VDOT's objective of providing safe, efficient, effective, and environmentally sound surface transportation systems.

- Advanced Traveler Information Systems
- Advanced Traffic Management Systems
- Automated Highway Systems
- Commercial Vehicle Operations

The Department's strategic plan details specific goals for each of these areas in the near-term (1992-1996), middle-term (1997-2001), and long-term (2002-2011) phases of Virginia PROGRESS.

Presently, VDOT is most active in the area of ATMS. The Department has operated a Traffic Management System (TMS) in Northern Virginia since 1985. This freeway system includes loop detectors, closed circuit television, and ramp metering. VDOT plans to expand this system, further develop its capabilities, and utilize it as a test-bed for ATMS research and development. For example, VDOT is currently conducting an evaluation of a Video Incident Detection System at the TMS. Finally, VDOT is in the process of deploying a TMS in the Hampton Roads region.

In addition to VDOT's ATMS activities, the Department has been active in other areas of IVHS. For example, VDOT is currently developing the FASTOLL system for the Dulles Toll Road. FASTOLL, expected to be operational in 1994, will utilize automatic vehicle identification (AVI) to automate toll collection. DATIS, the Dulles Area Traveler Information System, is another IVHS project in which the Department has been involved. The DATIS project is a public-private venture examining the development of ATIS in the Dulles Airport corridor of Northern Virginia. Finally, VDOT is in the preliminary planning stages for the "Smart Road," which will connect Blacksburg and Roanoke. This will be the first IVHS facility built from the ground up.

The Department has been an active participant in the national IVHS development effort, working with organizations such as IVHS America, H.E.L.P., and the I-95 Corridor Coalition. VDOT is also participating actively in the U.S. Department of Transportation's IVHS program.

For example, the Department is participating in a number of operational tests, including the Multi-jurisdictional Live Aerial Video Project, and the Washington D.C. Surveillance Test.

VDOT's IVHS Steering Committee is the policy body responsible for Virginia PROGRESS. The program is administered by the Department's Traffic Engineering Division. In addition, the Virginia Transportation Research Council is providing technical support and conducting IVHS research. The following individuals are suggested as contacts:

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This document presents a summary of all IVHS activities in which VDOT is currently involved. For each activity, the summary includes project descriptions, location, contacts, and status. Furthermore, the activities are grouped according to their classification: operational systems, operational tests, systems under development, and planning and research. Finally, this document is updated semiannually, and the reader is encouraged to obtain the latest version.

IVHS OPERATIONAL SYSTEMS

PROJECT: I-66/I-95/I-395 Traffic Management System

LOCATION: Northern Virginia

CONTACT: Jimmy Chu
Traffic Management System Manager
Virginia Department of Transportation
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Arlington, VA 22204

Phone: (703) 521-5695

PROJECT DESCRIPTION:

The traffic management system (TMS) monitors a 10-mile stretch of I-66 between the Capital Beltway (I-495) and the Roosevelt Bridge, an 11.5-mile segment of the Shirley Highway (I-395) between I-495 and the 14th Street Bridge, and 10 miles of the Capital Beltway (I-95) in the area of the Woodrow Wilson Bridge. The high-occupancy vehicle (HOV) facilities of these interstates are also controlled by the TMS. The TMS is staffed with 5 operators and 2 supervisors for 16 hours a day, 7 days a week, at the TMS center in Arlington.

Northern Virginia's TMS has many of the capabilities and features that define the IVHS functional area, Advanced Traffic Management Systems (ATMS). The primary responsibility of the TMS is incident management. Loop detectors are installed throughout the system at 1/2-mile spacings (550 total) to monitor traffic flow and detect incidents. Closed circuit television (CCTV) is utilized to verify detected incidents and aid in incident management. A total of 48 CCTVs are installed in the TMS.

Another responsibility of the TMS is to provide congestion management. Twenty-six ramp meters are stationed throughout the network to regulate traffic flow onto the interstates during peak periods. In addition, 100 changeable message signs are used to provide travelers with information concerning network conditions. These signs provide information such as high occupancy vehicle (HOV) restrictions, openings/closings of the reversible lanes on I-395, and freeway conditions (accidents, congestion, etc.).

An area that is given high priority in the TMS is one of the region's major bottlenecks, the Woodrow Wilson Bridge. Nine CCTVs are used to monitor traffic conditions in the area of the bridge, and 22 changeable message signs are used to pass on information to the traveler. This bridge surveillance activity is coordinated with the state of Maryland.

Finally, there are plans to expand the system significantly in the near future. As the HOV facilities of I-95 and I-66 are extended, additional CCTVs, ramp meters, and changeable message signs will be added to the system. In addition, it is expected that a number of IVHS

projects proposed for the region will depend upon integration with the TMS.

STATUS: The TMS was implemented in 1985 and is now fully operational. Advertisement for the expansion of the system is currently scheduled for July of 1994.

PROJECT: Suffolk District Tunnel Traffic Management Systems

LOCATION: Hampton Roads Region

CONTACT: Wayne White
District Tunnels & Toll Engineer
Virginia Department of Transportation
P.O. Box 3447
Hampton, VA 23663 Phone: (804) 727-4811

PROJECT DESCRIPTION:

Traffic control and surveillance systems are currently being used to manage traffic in three major tunnels in the Tidewater region: the Hampton Roads Bridge-Tunnel (I-64), the Downtown Tunnel (I-264), and the Monitor-Merrimac Memorial Bridge-Tunnel (I-664). These systems monitor traffic using CCTVs and vehicle detector loops. Traffic information is relayed to a central computer, on which incident detection software is utilized. In addition, the systems use changeable message signs to communicate conditions to the traveler.

The Hampton Roads Bridge-Tunnel and the Monitor-Merrimac Memorial Bridge-Tunnel currently utilize a highway advisory radio (HAR) system to further inform travelers of traffic conditions. Six transmitters are situated around the area in advance of major route diversion points. The HAR advises motorists of possible delays and suggests alternate routing choices.

Finally, VDOT is in the process of integrating the three tunnel traffic management systems. It is anticipated that the systems will report data to a centralized computer. This computer will process the information in order to provide output which may be used to better inform the traveling public.

STATUS: The surveillance systems and HAR are operational.

PROJECT: Hampton Roads Traffic Information Hotline

LOCATION: Hampton Roads Region

CONTACT: Wayne White
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PROJECT DESCRIPTION:

VDOT is participating in INFOLINE, a telephone information service operated by a local newspaper, to provide current traffic information on major crossings in the region. Users can select the category 7874 (RUSH) to obtain up-to-date descriptions of traffic on the Hampton Roads Bridge-Tunnel, Monitor-Merrimac Memorial Bridge-Tunnel, Downtown Tunnel, Midtown Tunnel, Coleman Bridge, and James River Bridge.

VDOT personnel at these facilities update the traffic descriptions at 15 minute intervals (more often if necessary) during peak periods. At other times, the messages are updated only when conditions warrant. The traffic description consists of a brief message such as "traffic is light/moderate/congested in both directions." This dissemination of real-time information gathered at traffic management systems is a step towards ATIS in the region.

STATUS: VDOT's RUSH category has been operational since mid-January, 1993.

PROJECT: Highway Surveillance Television Broadcast

LOCATION: Northern Virginia

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PROJECT DESCRIPTION:

This system allows local television stations to broadcast video from the CCTVs of the Northern Virginia TMS. The stations utilize this video to supplement area traffic reports. For example, rather than simply stating the location of an incident, a station can present live transmission from the scene. This system serves to better inform the traveler of the status of the transportation network.

It is anticipated that this system may be expanded to provide video feeds to information kiosks at major activity centers such as shopping malls. A traveler could access up-to-date traffic information at the kiosk and plan an appropriate route.

STATUS: Channel 8, a Fairfax County cable news station, is currently using CCTV video in its traffic reports. VDOT is also working with other major stations in the Washington area to provide a similar service.

IVHS OPERATIONAL TESTS

PROJECT: Washington D.C. Surveillance Test

LOCATION: Washington Metropolitan Area

CONTACTS: Charles Hall
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Phone: (804) 786-6777

PROJECT DESCRIPTION:

This operational test will evaluate the use of the Bell Atlantic cellular telephone infrastructure with passive statistical cellular and cellular geolocation technologies to estimate traffic congestion information and identify incidents. It is expected that the cellular telephones will serve as traffic "probes" by providing valuable information on the status of the surface transportation network. In essence, the system will provide surveillance capabilities with minimal infrastructure requirements.

The test will be conducted in selected regions of the Washington, D.C. Metropolitan area. VDOT is participating in this project with the Maryland State Highway Administration, Bell Atlantic Mobile Systems, Engineering Research Associates, and Farradyne Systems, Inc.

STATUS: This project was selected for participation in the 1993 Federal IVHS Operational Tests Program. It is expected that an agreement will soon be reached with the US DOT to allow the project's initiation.

PROJECT: Video Imaging Detection System

LOCATION: Northern Virginia

CONTACTS: Jimmy Chu
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PROJECT DESCRIPTION:

The purpose of this IVHS operational test is to evaluate the capabilities of a video imaging detection system (VIDS). The AUTOSCOPE system, which was chosen for evaluation, consists of a standard video camera, a microprocessor, and image processing software. Video images are analyzed using the software in order to estimate traffic flow characteristics. The primary focus of this project will be to evaluate the incident detection capabilities of a VIDS. In addition, the project will analyze the system's accuracy in monitoring traffic. This research will aid in assessing the value of using VIDS as sensors in IVHS.

Two cameras have been installed for use in this project. One camera monitors southbound traffic on the Woodrow Wilson Bridge, and the other camera monitors northbound traffic at the Telegraph Road interchange with I-95 (the Capital Beltway), which is approximately 1.5 miles south of the Woodrow Wilson Bridge. Furthermore, loop detectors are in place at these locations to allow for comparison of the system's detection capabilities.

STATUS: A six-month demonstration period was initiated in January 1993.

PROJECT: Airborne Video System

LOCATION: Northern Virginia

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Major Ron Miner
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Annandale, VA 22003 Phone: (703) 280-0500

PROJECT DESCRIPTION:

The airborne video system utilizes a video camera mounted to a helicopter to provide a mobile video platform for use in traffic management. The system will supplement fixed surveillance CCTVs with real-time information concerning traffic incidents.

It is expected that the use of real-time airborne video will serve as a valuable component of an ATMS, particularly in incident management. The video will provide a control center with information on the type, location, severity, and impact of an incident. This project, an IVHS operational test, has three major objectives:

1. Determine the capabilities and limitations of a remotely controlled gyro-stabilized camera.
2. Establish the effectiveness and reliability of a video link between a helicopter and a ground station and between a ground station and a traffic management center.
3. Evaluate the effectiveness and applications of real-time video for an ATMS.

In addition to the evaluation period of the first phase of this project, future phases will examine the transfer of information between jurisdictions for regional ATMS applications. Many of the institutional issues that have been identified as key to the success of IVHS will be considered in this phase.

STATUS: System evaluation is currently ongoing. The completion of the evaluation will occur in December 1993.

IVHS SYSTEMS UNDER DEVELOPMENT

PROJECT: I-64 Traffic Management System

LOCATION: Hampton Roads Area

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PROJECT DESCRIPTION:

The I-64 TMS will consist of a complete traffic surveillance, control, and management system for the 8-mile reversible bus and HOV roadway being constructed in the median of I-64 between I-564 and I-264/VA-44. In addition, this system will encompass I-64 concurrent flow HOV lanes on a 4-mile section from the I-264/VA-44 interchange to Indian River Road, and a 4-mile section on VA-44. The system will also accommodate upgrades to allow for management of the entire freeway system in the region.

In many ways, the I-64 TMS is similar to the Northern Virginia TMS. As in Northern Virginia, the I-64 TMS will utilize loop detectors, CCTVs, and changeable message signs. In addition, incident detection and management of the HOV facilities will be primary functions of the TMS. Finally, the system will serve as a foundation for regional IVHS development.

An interesting area of concentration of the I-64 TMS will be in traffic diversion. Given the often congested conditions of the tunnels and bridges in the region, strategies to divert travelers to other crossing points will be critical. A number of changeable message signs will be dedicated as point diversion signs for the sole purpose of encouraging alternate routes.

The I-64 TMS will face a major challenge in interfacing with other management systems already in place in the region. Many cities in the area, as well as the major tunnels, have developed and implemented independent traffic control systems. In coordinating these various systems, a number of institutional problems need to be addressed.

STATUS: Advertisement for the system is scheduled for April of 1993.

PROJECT: FASTOLL

LOCATION: Dulles Toll Road - Northern Virginia

CONTACTS: Charles Hall
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Richmond, VA 23219

Phone: (804) 786-6777

PROJECT DESCRIPTION:

FASTOLL is an integrated toll collection system that has been designed to replace the existing standard manual system on the Dulles Toll Road. Although FASTOLL will continue to use both manual toll collection and automatic coin collection machines, it will also utilize a toll collection system based on automatic vehicle identification (AVI). The AVI system consists of three functional elements: a vehicle mounted transponder (or tag), a roadside reader unit, and a computer system for data processing. FASTOLL will allow drivers to pay their tolls by deducting them from prepaid accounts as their tags are read. AVI-equipped vehicles will not need to stop as their tags are read, thereby increasing the efficiency of the toll collection process.

There are a number of advantages expected from FASTOLL. First, the system will eliminate the delays caused by traditional toll booths, thereby increasing the utilization of highway capacity. Second, it will free personnel from the monotonous and hazardous task of collecting tolls. Finally, FASTOLL includes a new accounting system that should provide greater accuracy than the present system.

The experience gained with AVI through the FASTOLL system will be valuable in preparing for future applications of this technology. For example, it is intended that the design of FASTOLL be adaptable for tolling applications throughout the Commonwealth. Furthermore, data obtained with AVI, such as travel times, may prove valuable in future transportation planning efforts.

STATUS: VDOT is currently considering contractor proposals for the system. It is expected that FASTOLL will be operational in 1994.

PROJECT: Northern Virginia Traffic Signal System

LOCATION: Northern Virginia

CONTACTS: Charles Hall
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PROJECT DESCRIPTION:

The Northern Virginia traffic signal system will operate 700 signals with expansion capabilities to at least 2,000 signals. This state-of-the-art system will allow for signal adjustments necessitated by traffic conditions and for a central monitoring location to alter timing plans. Preliminary studies of the signal system suggest that it will reduce total delay between 14 and 27 percent, total stops between 21 and 23 percent, and total travel time between 8 and 13 percent. Furthermore, the system design will provide flexibility, allowing the system to incorporate advanced traffic control algorithms in the future.

The signal system is expected to play a significant role in future ATMS efforts in the Northern Virginia region. As such, the system has been identified in federal legislation as an IVHS operational test. VDOT is currently considering strategies for integrating the new signal system with regional ATMS.

STATUS: Advertisement for the system is scheduled for August of 1993.

PROJECT: Highway Advisory Radio

LOCATION: Northern Virginia

CONTACTS: Kenneth Wester
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PROJECT DESCRIPTION:

Highway Advisory Radio (HAR) can be considered a first generation ATIS. Using a radio broadcasting system, HAR allows for real-time highway network information to be presented to the traveler. Fairfax County and VDOT are planning to use HAR on a regional basis in Northern Virginia as a significant element in the traffic management effort. There are two primary goals for the HAR system:

1. Reduce accidents by forewarning motorists of unusual conditions on the network
2. Reduce motorist travel times and congestion near incident sites by providing enough information so that motorists can make informed routing decisions

It is anticipated that an initial HAR system, which will consist of 7 transmitters accessible through standard telephone lines, will provide information about the following:

1. Major traffic incidents (i.e., road closure)
2. Accidents resulting in traffic flow disruption
3. Woodrow Wilson Bridge openings
4. Inclement weather closures / road conditions
5. Daily maintenance operations
6. Construction projects

STATUS: VDOT is in the process of acquiring the broadcast equipment. It is anticipated that the system will be on-line by Fall of 1993.

IVHS PLANNING AND RESEARCH

PROJECT: The University Road Connection - a "Smart Road"

LOCATION: Blacksburg/Roanoke, Virginia

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Center for Transportation Research
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PROJECT DESCRIPTION:

The "smart road" will be a 6-mile route connecting the Blacksburg and Roanoke areas. It will be constructed primarily to demonstrate, evaluate, and test IVHS technologies. This will be the first IVHS facility built from the ground up in the United States. This is advantageous in that the various sensors and communications media (such as fiber optic cable) can be designed to function as an integral component of the system. In addition, this project will provide a unique opportunity to examine the application of IVHS in intercity transportation.

It is anticipated that this facility will be used to look at the more advanced aspects of IVHS in addition to employing a combination of ATMS, traveler information systems, and CVO. The development of safety enhancement systems will be a primary objective. There has been interest expressed by major automakers to utilize the facility as a test-bed for their electronic safety systems, such as all weather/night vision devices. Finally, the facility will be utilized to conduct research in automated highway systems (AHS).

STATUS: VDOT has entered into a memorandum of understanding with the Virginia Polytechnic and State University on this project.

PROJECT: I-95 Corridor Coalition

LOCATION: I-95 Corridor: Petersburg, Virginia - Portland, Maine

CONTACTS: Charles Hall
Assistant State Traffic Engineer
Virginia Department of Transportation
1401 East Broad Street
Richmond, VA 23219 Phone: (804) 786-6777

PROJECT DESCRIPTION:

The I-95 Corridor Coalition will use IVHS technology to improve travel on the I-95 corridor, from Petersburg, Virginia, to Portland, Maine. It is intended that this highly urban and multimodal corridor will become a showcase for IVHS technologies. The program will focus on examining IVHS institutional issues, developing multistate traffic management strategies, and developing interregional ATIS.

The program is designated as a "priority corridor" within the Federal Highway Administration's IVHS Corridors Program. This program, which was created by ISTEA, will provide substantial support for the I-95 Corridor Coalition. VDOT is a member of the coalition and is actively participating in initial planning efforts.

The coalition has already made significant contributions to integrated multistate traffic management. As a result of the coalition, traffic management systems in the corridor, including the Northern Virginia TMS, work together to coordinate the management of major freeway incidents. By doing so, traffic may be diverted well ahead of congested areas.

STATUS: VDOT is an active participant in the coalition.

PROJECT: Hampton Roads IVHS Program - COMPARE

LOCATION: Hampton Roads Region

CONTACTS: Charles Hall
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Virginia Department of Transportation
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Richmond, VA 23219

Phone: (804) 786-6777

PROJECT DESCRIPTION:

VDOT is working with the cities of the Hampton Roads region and various regional transportation-oriented groups to examine opportunities to implement a comprehensive IVHS program in the region. The unique characteristics of the region, including the large number of tourists and a high concentration of military personnel, make Hampton Roads an ideal location to examine ATMS, ATIS, and Advanced Public Transportation Systems (APTS).

The COMPARE project, a planning effort for IVHS in Hampton Roads, has three major initiatives:

1. The development of a comprehensive concept plan for implementation of IVHS technologies in the Hampton Roads area.
2. The development and design of an inter-agency voice/data communication system that provides common access to all parties involved in traffic management in the region.
3. The development of an ATIS for the Hampton Roads area.

This project will also serve as a "pilot" application of the IVHS planning process, developed by the FHWA. The process will be utilized to develop the deployment plan for COMPARE. In addition, an evaluation will be conducted to determine the effectiveness of the IVHS planning process.

STATUS: COMPARE has been selected by the FHWA to participate in the IVHS Early Deployment Program.

PROJECT: Rural Applications of Advanced Traveler Information Systems (ATIS)

LOCATION: Research Project

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PROJECT DESCRIPTION:

The objective of this federally sponsored research project is to assess rural traveler information requirements; identify and evaluate potentially applicable ATIS technologies; and develop, evaluate, analyze, and test one or more ATIS systems. VDOT has pledged its cooperation in this study with the participants: JHK & Associates, Virginia Tech, Hughes Aircraft Company, and Bell Atlantic.

After an initial effort to assess rural traveler information requirements, a review of the state of the art in ATIS will be conducted. This foundation will be used to develop up to eight Rural ATIS system concepts. Four of the concepts will be chosen for complete functional design specifications. Finally, at least one of the designs will be prototyped for field testing. The results of the study will be utilized to set guidelines for selection, design, and implementation of ATIS in rural areas.

STATUS: This project was initiated in January of 1993. Currently, the participants are assessing rural traveler information needs. The project will be completed in July of 1995.

PROJECT: Commercial Vehicle Operations (CVO) Development

LOCATION: Statewide

CONTACT: Jim Robinson
Transportation Engineering Programs Supervisor
Virginia Department of Transportation
1401 East Broad Street
Richmond, VA 23219 Phone: (804) 786-2878

PROJECT DESCRIPTION:

Virginia has been an active participant in CVO development in a number of ways. For example, VDOT is currently participating in a pooled-fund research project with other FHWA Region III states to examine institutional issues in implementing CVO in the region. This effort will analyze existing state practices for vehicle licensing, driver licensing, permitting, taxation, regulation, enforcement and safety inspections. Finally, this will be used to identify beneficial CVO technology, such as state line beacons, electronic credentials, and mainline enforcement screening. The final product of this study will be an implementation plan for CVO in the region.

Virginia is also participating in a similar CVO study in FHWA Region IV. Therefore, it is evident that Virginia is playing a critical role as the "bridge" state for the East Coast. It is anticipated that these research efforts will improve the efficiency of commerce in the interstate corridors.

Another example of Virginia's activity in CVO is the Commonwealth's efforts in the research and development of Weigh-In-Motion (WIM) systems. The Virginia Transportation Research Council has conducted a study comparing a number of WIM systems. In addition, VDOT has installed permanent WIM sites throughout the Commonwealth to provide data for the Long-Term Pavement Performance Project as part of the Strategic Highway Research Program (SHRP).

STATUS: This is an ongoing activity within VDOT.

PROJECT: Washington Regional IVHS Study

LOCATION: Washington Metropolitan Area

CONTACTS: Charles Hall
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1401 East Broad Street
Richmond, VA 23219

Phone: (804) 786-6777

PROJECT DESCRIPTION:

The objective of this study is to plan and develop preliminary designs for a regional IVHS system in the Washington metropolitan area. In addition, the study will identify a flexible plan for staged implementation of the various system components.

It is expected that the major components of the study will be:

- The identification of regional surface transportation objectives, particularly as they relate to IVHS
- The examination of the existing condition of surface transportation in the region
- The identification and addressing of institutional, technical, and operational issues for regional IVHS
- The development of a system design and staged implementation plan

The primary benefit of this study is expected to be the integration of the various IVHS systems under development by different organizations in the region. VDOT is participating in this study along with the Maryland State Highway Administration, the District of Columbia, local governments, and universities.

STATUS: This is an ongoing activity.

PROJECT: Dulles Area Traveler Information System (DATIS)

LOCATION: Northern Virginia

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PROJECT DESCRIPTION:

The Dulles Area Transportation Association (DATA), a joint public-private organization, is currently developing DATIS, an ATIS for the heavily congested Dulles corridor. DATIS will utilize advanced methods of collecting, interpreting, conveying, and displaying data to provide real-time information about road and traffic conditions, highway incidents, construction detours, service delays on Metrorail, parking availability at Park-and-Ride, airport and Metrorail parking lots, and other information necessary to make intelligent travel decisions. Of course, the ultimate goal of DATIS is to relieve congestion and improve mobility in the corridor. The two major tasks of the DATIS project are:

1. To develop a plan for an operational field test of DATIS. This includes a recommended implementation plan, a cost estimate, an assessment of potential private sector roles, and a proposed organizational framework.
2. To assess the commercial market potential and the necessary interagency coordination for deploying DATIS.

STATUS: A final report on the DATIS project has been submitted.

PROJECT: Simulation Analysis of Traffic Diversion Strategies for Freeway Incidents

LOCATION: Research Project

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PROJECT DESCRIPTION:

A major focus of ATMS is incident management. While the detection component of incident management is receiving considerable attention, the recovery phase remains a rather weak element. Diversion is especially critical in incident recovery. This research project will utilize simulation to develop a database of operationally sound diversion strategies for various types of incidents. The database will be targeted for the Northern Virginia TMS, serving as a useful tool to the traffic management team. Issues that will be considered include: the effects of diversion on the arterial network, the use of multiple diversion routes, and the use of periodic diversion.

This project is a first step toward developing sophisticated user support systems for ATMS. For example, it is planned to utilize the database to develop an expert system which will guide traffic management personnel through the management of incidents. In addition, this research will pave the way for the utilization of real-time simulation within ATMS.

STATUS: This project was initiated in February of 1993. It should be completed in June of 1994.

PROJECT: Development of an ATMS Software Support System Based on a Short-Term Traffic Condition Prediction Model

LOCATION: Research Project

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PROJECT DESCRIPTION:

Current traffic management systems function primarily to monitor freeway facilities. In order to upgrade these systems to ATMS status, it will be necessary to use surveillance information to actively manage the transportation network. This project will address this by examining ways to derive useful *information* from surveillance *data*.

The purpose of this research project is to develop a prototype ATMS software support system based on a short-term traffic condition prediction model. Predictive models have been identified as an essential component of ATMS in the *IVHS America Strategic Plan*. The following scenario illustrates the expected operation of such a system. At 4:30 pm, current raw surveillance data, along with other basic data (such as day-of-week, time-of-day, and weather classification) is input to the model. From 4:30 until 4:32 pm, the model calculations are executed by the computer. Upon completion of execution, the model output, i.e., the predicted traffic conditions at 4:45 pm and 5:00 pm, is displayed to the operator. The prototype system will be evaluated at the Northern Virginia TMS.

The development and evaluation of the software system will address the following key issues:

- The feasibility of developing short-term traffic condition prediction models for ATMS application.
- The utility of short-term traffic condition prediction models in ATMS.

STATUS: This research project was initiated in January of 1993. It should be completed in June of 1994.

PROJECT: Transamerica Transportation Corridor

LOCATION: Nationwide

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PROJECT DESCRIPTION:

The purpose of this study is to examine the feasibility of developing a new transcontinental transportation corridor between Virginia and California. However, the study is intended to be more than a traditional interstate highway feasibility study. Rather, the study will explore the future. For example, the study will consider concepts such as high speed rail, IVHS, and intermodal linkages.

Some of the basic questions that this study will address include:

- Is a new transcontinental transportation corridor warranted? Is it needed?
- Are there new or emerging modal, multimodal, technological or joint use opportunities and concepts that might make sense?
- Might this corridor be an automated or semi-automated highway?
- What legal, institutional, legislative, funding and public policy changes will be needed for such a system?

Virginia is participating in this study with ten other states. In addition, the U.S. DOT is involved along with a number of private organizations.

STATUS: The study is currently ongoing. The target date for study completion is fall of 1993.