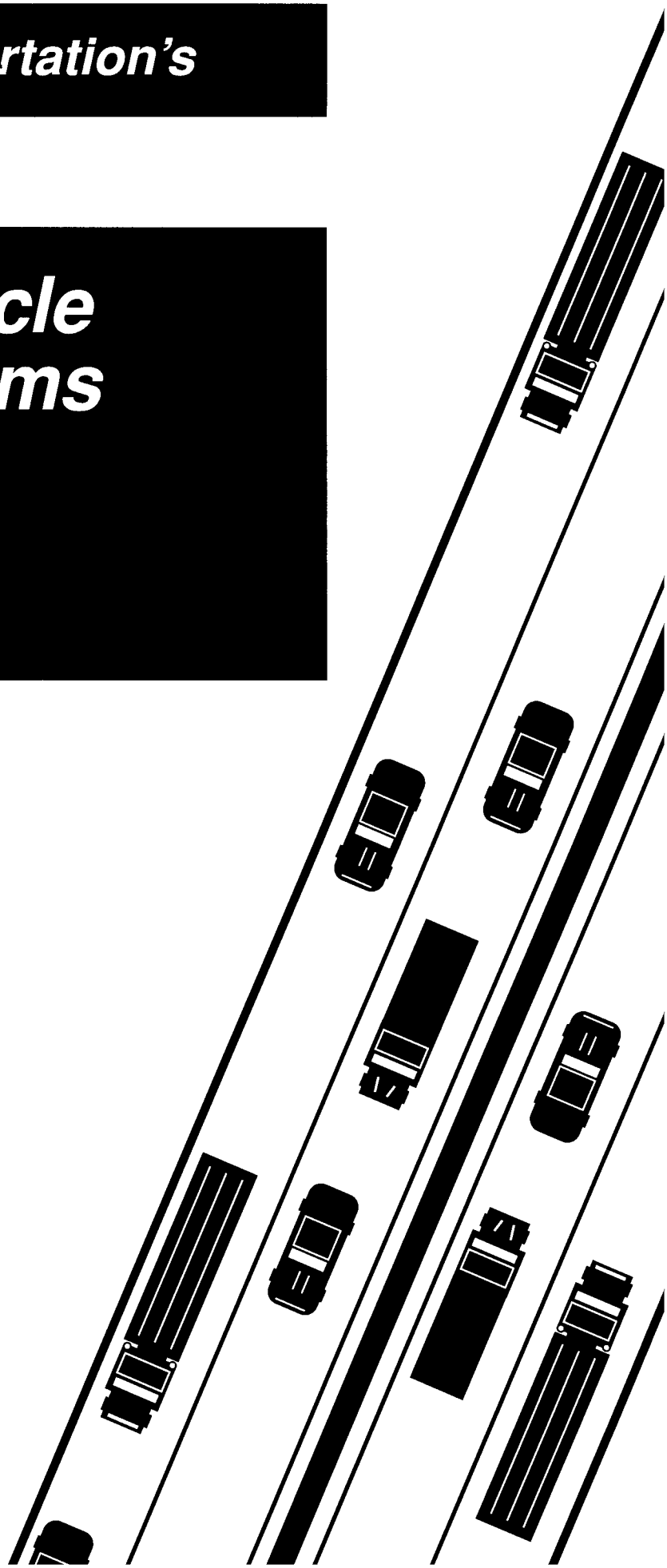
Department of Transportation's

Intelligent Vehicle Highway Systems Projects

March 1994



DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

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and
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Office of Crash Avoidance Research (NRD-50)

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INTRODUCTION

The Intelligent Vehicle Highway Systems (IVHS) program applies advanced and emerging technologies in such fields as information processing, communications, control, and electronics to surface transportation needs. If these technologies can be effectively stimulated, integrated, and deployed, the public will be able to more efficiently use the Nation's highway infrastructure and energy resources by making more informed choices about travel and route alternatives. Successful deployment of IVHS services and systems will achieve improvements in safety, mobility, and productivity, and reduce harmful environmental impacts, particularly those caused by traffic congestion.

As described in the National IVHS Program Plan, the IVHS program is focused on the development and deployment of a collection of user services. Twenty eight inter-related user services have been defined to date as part of the national program planning process. User services are defined, not along lines of common technologies, but based upon the services or benefits that various users might receive. The services are in various stages of maturity; some are available today, others will require significant research, development, testing, and advances in technology applications before they are ready for deployment.

Deployment of these user services will help to attain the goals defined for the national IVHS program by creating safer and better informed travelers, improved traffic control systems, and more efficient transit and commercial vehicle operations. Because of their interdependencies, it is likely that individual user services will not be deployed independently. For example, a fully functioning Route Guidance service will require real-time traffic information that is collected and processed by the Traffic Control service. Thus, user services have been grouped into "bundles," based on likely deployment scenarios. The bundles of user services are shown in the table on the following page.

Bundle	*User Services*
Travel and Traffic Management	Pre-Trip Travel Information En-route Driver Information Route Guidance Ride Matching and Reservation Traffic Control Incident Management Travel Demand Management
Public Transportation Management	Public Transportation Management En-route Transit Information Personalized Public Transit Public Travel Security
Electronic Payment	Electronic Payment Services
Commercial Vehicle Operations	Commercial Vehicle Electronic Clearance Automated Roadside Safety Inspection On-board Safety Monitoring Commercial Vehicle Administrative Processes Hazardous Materials Incident Notification Commercial Fleet Management
Emergency Management	Emergency Notification and Personal Security Emergency Vehicle Management
Advanced Vehicle Safety Systems	Longitudinal Collision Avoidance Lateral Collision Avoidance Intersection Collision Avoidance Vision Enhancement for Crash Avoidance Safety Readiness Pre-Crash Restraint Deployment Automated Vehicle Operation

To advance the development, testing, and ultimate deployment of these user services, the national IVHS program includes a range of initiatives by both the public and private sectors. These include research and development (R&D) activities, operational tests, system architecture development, institutional/policy studies, and deployment support efforts.

This report describes those IVHS projects that are wholly or partially funded by the Department of Transportation's (DOT) modal administrations, including the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the National Highway Traffic Safety Administration (NHTSA). The report is a complement to the National IVHS Program Plan, and is organized to describe those DOT-sponsored activities which support the development of user services, national compatibility planning, deployment, deployment support, and program assessment.

TRAVEL AND TRAFFIC MANAGEMENT

TRAVEL AND TRAFFIC MANAGEMENT

- Pre-Trip Travel Information

  Provides information for selecting the best departure time, transportation modes and routes.

  Pre-trip traveler information allows travelers to access a complete range of intermodal transportation information at home, work, and other major sites where trips originate. For example, timely information on transit routes, schedules, transfers and fares, and ride matching services are included. Real-time information on accidents, road construction, alternate routes, traffic speeds along given routes, parking conditions, event schedules, and weather information complete the service. Based on this information, the traveler can select the best departure time, route and modes of travel, or decide to postpone or not to make the trip at all.

- En-Route Driver Information

  Driver advisories and in-vehicle signing for convenience and safety.

  Driver advisories are similar to pre-trip planning information, but are provided once travel begins. Driver advisories convey information about traffic conditions, incidents, construction, transit schedules, and weather conditions to drivers of personal, commercial and public transit vehicles. This information allows a driver to select the best route, or shift to another mode mid-trip if desired.

  In-vehicle signing, the second component of en-route driver information, would provide the same types of information found on physical road signs today, directly in the vehicle. The service could be extended to include warnings of road conditions and safe speeds for specific types of vehicles (e.g., autos, buses, large trucks), but potential users include drivers of all types of vehicles. This service might be especially useful to elderly drivers, or in rural areas with large numbers of tourists and unusual or hazardous roadway conditions.

- Route Guidance

  Provides travelers with simple instructions on how to reach their destinations.

  The route guidance service provides a suggested route to reach a specified destination. Early route guidance systems will be based on static information about the roadway network, transit schedules, etc. When fully deployed, route guidance systems will provide travelers with directions to their destinations based on real-time information about the transportation system. The route guidance service will consider traffic conditions, status and schedule of transit

systems, and road closures in developing the best route. Directions will generally consist of simple instructions on turns or other upcoming maneuvers. Users of the service include not only drivers of all types of vehicles, but also non-vehicular travelers, such as pedestrians or bicyclists, who could get specialized route guidance from a hand-held device.

- Ride Matching and Reservation

  Makes ride sharing more convenient.

  This service will provide real-time ride matching information and reservations to users in their homes, offices or other locations, and assist transportation providers with vehicle assignments and scheduling. The service will also provide a clearinghouse for financial transactions. This will expand the market for ridesharing as an alternative to single occupant automobile travel, and will provide for enhanced alternatives for special population groups, such as the elderly or the handicapped.

- Traveler Services Information

  Provides a reference directory, or "yellow pages" of service information.

  Traveler services information provides quick access to travel related services and facilities. Examples of information that might be included are the location, operating hours, and availability of food, parking, auto repair, hospitals, and police facilities. Traveler services information would be accessible in the home, office or other public locations to help plan trips, and might also be available enroute. When fully deployed, this service will connect users and providers interactively, to request and provide needed information. A comprehensive, integrated service could support financial transactions like automatic billing for purchases.

- Traffic Control

  Manages the movement of traffic on streets and highways.

  This service will provide for the integration and adaptive control of the freeway and surface street systems to improve the flow of traffic, give preference to transit and other high occupancy vehicles, and minimize congestion while maximizing the movement of people and goods. Through appropriate traffic controls, the service will also promote the safety of non-vehicular travelers, such as pedestrians and bicyclists. This service requires advanced surveillance of traffic flows, sophisticated analysis techniques for determining appropriate traffic signal and ramp metering controls, and communication of these controls to the roadside infrastructure. This service gathers data from the transportation system, fuses it into usable information, and uses it to determine the optimum assignment of right-of-way to vehicles and pedestrians. The real-time traffic information collected by the Traffic Control service also provides the foundation for many other user services.

  While the actual users of the service will generally be public transportation officials, the ultimate beneficiaries will be drivers of all types of vehicles, transit riders, pedestrians, bicyclists and other travelers.

- Incident Management

Helps officials quickly identify incidents and implement a response to minimize their effects on traffic.

This service enhances existing capabilities for detecting incidents and taking the appropriate actions in response to them. The service would use advanced sensors, data processing, and communications to improve the incident management capabilities of transportation and public safety officials. The service will help these officials to quickly and accurately identify a variety of incidents, and to implement a response which minimizes the effects of these incidents on the movement of people and goods. Traffic movement adjustments over a wide area would be executed through the Traffic Control user service, while decisions at the site of the incident are made by police agencies. In addition, the service will help officials to predict traffic or highway conditions so that they can take action in advance to prevent potential incidents or minimize their impacts. While the users of this service are primarily public officials, the ultimate beneficiaries are commercial and transit operators, and the traveling public.

- Travel Demand Management

Supports policies and regulations designed to mitigate the environmental and social impacts of traffic congestion.

This service generates and communicates management and control strategies that support the implementation of programs to (1) reduce the number of individuals who choose to drive alone, especially to work, (2) increase the use of high occupancy vehicles and transit, (3) reduce the impacts of high polluting vehicles, and (4) provide a variety of mobility options for those who wish to travel in a more efficient manner, for example in non-peak periods. The service allows employers to better accommodate the needs and lifestyles of employees by encouraging alternative work arrangements such as variable work hours, compressed work weeks, and telecommuting. Travel demand management strategies could ultimately be applied dynamically, when congestion or pollution conditions warrant. For example, disincentives such as increased tolls and parking fees could be applied during pollution alerts or when major incidents occurred, while transit fares would be lowered to accommodate the increased number of travelers changing modes from driving alone. Such strategies will reduce the negative impacts of traffic congestion on the environment and overall quality of life.

Travel and Traffic Management

(Research and Development)

ADDITIONAL PROTOTYPE DEVELOPMENT (RTTASC)

DESCRIPTION:	This study focuses on the development of three additional real-time traffic adaptive signal control (RTTASC) prototypes which, together with the prototype developed under the ongoing RTTASC study, will be evaluated under a subsequent study.
START DATE:	To be determined.
END DATE:	To be determined.
STATUS:	The projected award for this study is the spring of 1994.
ESTIMATED TOTAL PROJECT COST:	N/A
ANTICIPATED TOTAL FEDERAL SHARE:	N/A
FEDERAL FUNDS THROUGH FY 93:	N/A
CONTRACTOR:	To be determined.
CONTACT:	Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

ADVANCED COMPUTING ARCHITECTURES FOR ADVANCED TRAFFIC MANAGEMENT SYSTEMS (ATMS)

DESCRIPTION:	This study will provide technical support for the design and implementation of the architecture for the Traffic Management Laboratory's (TML) Advanced Traffic Management Systems (ATMS) simulator. The Volpe National Transportation Systems Center (VNTSC) will provide the necessary expertise to assist in the design of the simulator, selection of the software/hardware, provide training on the operation of the components of the TML, and conduct the necessary benchmarking to assess portability and integration issues.
START DATE:	February 1994
END DATE:	To be determined.
STATUS:	An inter-agency agreement has been awarded to VNTSC.
ESTIMATED TOTAL PROJECT COST:	N/A
ANTICIPATED TOTAL FEDERAL SHARE:	$1,200,000
FEDERAL FUNDS THROUGH FY 93:	N/A
CONTRACTOR:	Volpe National Transportation Systems Center (VNTSC)
CONTACT:	Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

ADVANCED TRAVELER INFORMATION SYSTEMS (ATIS) COMMUNICATIONS ALTERNATIVES TEST AND EVALUATION

DESCRIPTION: Investigations into communications technologies and issues associated with IVHS systems will be conducted. Activities will be focused upon identifying and analyzing particular communications technologies, which include RF and wireline, for IVHS functions. Investigations will also include communications protocol issues. Preferred communications alternatives will be recommended for specific IVHS functions.

START DATE: To be determined.

END DATE: To be determined.

STATUS: An RFP was issued in January 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: James Arnold, FHWA R&D, HSR-10, (703) 285-2974

ANALYSIS OF TRAVELERS' PREFERENCES FOR ROUTING

DESCRIPTION:	The primary purpose is to investigate decision criteria used by travelers for selecting routes, choosing departure times, and rerouting when encountering or receiving advance information about traffic congestion.
START DATE:	To be determined.
END DATE:	To be determined.
STATUS:	Plans for this project are being formulated.
ESTIMATED TOTAL PROJECT COST:	N/A
ANTICIPATED TOTAL FEDERAL SHARE:	N/A
FEDERAL FUNDS THROUGH FY 93:	N/A
CONTRACTOR:	To be determined.
CONTACT:	Truman Mast, FHWA R&D, HSR-30, (703) 285-2404

ASSESSMENT OF THE EFFECTS OF IN-VEHICLE NAVIGATION SYSTEMS ON DRIVER PERFORMANCE

DESCRIPTION: Analytical and empirical studies are being conducted to provide generic human factors design guidelines for commercial and non-commercial navigation and information systems. In addition, a testing methodology with criteria is being developed to allow evaluation of the safety of drivers' performance when using the systems. This is a joint project between FHWA and NHTSA.

START DATE: September 1989

END DATE: September 1994

STATUS: The contractor has determined the optimal information and presentation modes for several types of Advanced Traveler Information Systems information. Laboratory assessments of both single and integrated function system mockups are presently being conducted to optimize system/driver interfaces.

ESTIMATED TOTAL PROJECT COST: $720,000

ANTICIPATED TOTAL FEDERAL SHARE: $720,000

FEDERAL FUNDS THROUGH FY 93: $720,000

CONTRACTOR: University of Michigan Transportation Research Institute

CONTACT: Nazemeh Sobhi, FHWA R&D, HSR-30, (703) 285-2907

COORDINATED OPERATION OF RAMP METERING AND SIGNAL CONTROL

DESCRIPTION:	This study will develop and test, through simulation, traffic control strategies that coordinate metering signals on freeway ramps and traffic signals on adjacent surface streets. The proposed control strategies will be applied to individual interchanges and freeway corridors.
START DATE:	April 1989
END DATE:	August 1992
STATUS:	FHWA is re-running the test cases in the final report. A revised report will be completed by summer 1994.
ESTIMATED TOTAL PROJECT COST:	$474,342
ANTICIPATED TOTAL FEDERAL SHARE:	$474,342
FEDERAL FUNDS THROUGH FY 93:	$474,342
CONTRACTOR:	Farradyne Systems, Inc.
CONTACT:	Henry Lieu, FHWA R&D, HSR-11, (703) 285-2410

DATABASES FOR TRAFFIC MODEL VERIFICATION AND VALIDATION

DESCRIPTION: This study involves defining data required for the validation and verification of traffic models. This study will also include the collection and storage of traffic data from 1-3 different sites strategically selected around the country and the subsequent maintenance of the databases. Additionally, issues will be addressed including type of storage needed (central vs. distributed), hardware and software platforms, and user interfaces (pre- and post-processing activities). It is expected that this traffic data will be obtained from existing data sources or on-going IVHS field operational tests.

START DATE: To be determined.

END DATE: To be determined.

STATUS: An RFP is scheduled to be issued in May 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

DESIGN OF SUPPORT SYSTEMS FOR ADVANCED TRAFFIC MANAGEMENT SYSTEMS (ATMS) CONTROL CENTERS

DESCRIPTION: This study will develop 9 support systems for mature Advanced Traffic Management Systems (ATMS) control centers. The study also requires that the contractor define the platform on which these support systems will operate and how these support systems will be integrated to the rest of the systems (e.g., signal control, ramp metering, etc.) within the control center.

START DATE: September 30, 1992

END DATE: September 30, 1997

STATUS: Task A- Literature Review, is complete. Task B-, the generic specifications for a mature Advanced Traffic Management Systems (ATMS) and the Concept of Operations will be developed. This Task is 90% complete. A list of subsystems has been generated by the contractor. The contractor is in the process of grouping them into support systems and developing information flow diagrams. Task C-, a first cut design will be made. This Task is about 50% complete. Complete design of ATMS is to be completed by spring 1994.

ESTIMATED TOTAL PROJECT COST: $3,072,679

ANTICIPATED TOTAL FEDERAL SHARE: $2,942,679

FEDERAL FUNDS THROUGH FY 93: $2,942,679

CONTRACTOR: This contract was awarded to a consortium, led by Loral AeroSys, with the University of Arizona, City of Tucson, KLD Associates, and TASC.

CONTACT: Cesar Perez, FHWA R&D, HSR-11, (703) 285-2408

DETECTION TECHNOLOGY FOR IVHS

DESCRIPTION: This contract will develop functional and performance specifications for permanently deployed and portable vehicle detectors in IVHS applications. Candidate vehicle detector technologies will be evaluated through laboratory and field testing of currently available state-of-the-art detectors. Such detectors include ultrasonic, infrared, microwave radar, video image processors, magnetometers, and inductive loops. In some instances, commercially available detectors may not meet IVHS specifications. In [illegible] cases, functional requirements are to be developed for the detectors. [illegible] part of the study deals with determining if a permanent national [illegible] detector test facility is needed to provide vehicle detector test data [illegible] commercial vehicle detectors used in IVHS.

START DATE: [illegible] 27, 1991

END DATE: [illegible] 1994

STATUS: [illegible] ctor has completed laboratory tests and field tests of most [illegible] ally available vehicle detectors. The test data is presently being [illegible] and the results evaluated.

ESTIMATED TOTAL PROJECT COST: $1,081,122

ANTICIPATED TOTAL FEDERAL SHARE: $1,081,122

FEDERAL FUNDS THROUGH FY 93: $1,081,122

CONTRACTOR: Hughes Ground Systems Group

CONTACT: Milton K. Mills, FHWA R&D, HSR-10, (703) 285-2402

DEVELOPMENT AND LABORATORY TESTING OF NEW DETECTION TECHNOLOGIES AND SURVEILLANCE CONCEPTS

DESCRIPTION: This funding will be used to identify and develop new detection technologies and surveillance concepts. With the rapid advances in industry technology, new options for detection need to be made available for use by traffic management centers. As IVHS-class Dynamic Traffic Assignment, Real-Time Traffic-Adaptive Control, and Incident Detection Systems are developed, new measures of effectiveness (such as queue lengths) may be required inputs to these modules. This study will identify potential means of obtaining this data directly from the field using new surveillance and detection capabilities that are more accurate and cost-effective than those which are currently available.

START DATE: To be determined.

END DATE: To be determined.

STATUS: A Broad Agency Announcement is scheduled to be issued in April, 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

DYNAMIC TRAFFIC ASSIGNMENT (DTA) & SYNTHETIC ORIGIN AND DESTINATION (O-D) MATRICES

DESCRIPTION: This study will develop a deployable dynamic traffic assignment (DTA) model designed under the 1990 study entitled "Traffic Modelling Needs for Advanced Traveler Information Systems". Since dynamic origin-destination data is required for input to the model, this study will also develop algorithms to create synthetic O-D data. Three variations to the original model design to account for different IVHS deployment levels will be developed. These deployment levels will consider items such as the type and coverage of traffic monitoring and incident detection systems, the type and capability of traffic signal control systems, and the extent of surface street and freeway control integration. This study will also conduct sensitivity analyses regarding the coupling of the DTA with traffic simulation models of different resolution to assess the impact of the routing and/or diversion strategies (including transit) developed prior to implementation, the impact due to congestion pricing, the viability of using the output of the simulation model to complement, supplement, and/or validate the data collected by surveillance systems, the relationship of DTA to air quality, and the operational requirements of the DTA-simulation system relative to execution speed. This study will address verification and validation processes for the resulting product. The verification process will be accomplished by implementing the product at one selected site.

START DATE: To be determined.

END DATE: To be determined.

STATUS: An RFP is scheduled to be issued in April 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

ELECTRONIC TRAFFIC CONTROL DEVICE COMMUNICATIONS STANDARD PROTOCOL

DESCRIPTION: The funding for this effort will evaluate protocols, including preliminary protocol simulation to determine any foreseeable communications bottlenecks and pitfalls, and review software designs of existing software modules that support current standards. The final product will be a public domain detailed software design for a communications protocol to be used in the integration of electronic traffic control devices from multiple vendors. This funding will support and expedite the development of a communications protocol standard usable on a wide variety of computers ranging from field controllers to mini-computers.

START DATE: To be determined.

END DATE: To be determined.

STATUS: A consultant will evaluate the National Traffic Control/IVHS Communications Protocol developed by NEMA. Expert assistance will be sought for the software design, if needed.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

ENCODING SCHEME FOR ADVANCED TRAFFIC MANAGEMENT SYSTEMS (ATMS)/ ADVANCED TRAVELER INFORMATION SYSTEMS (ATIS) DATA FUSION

DESCRIPTION: In concert with their IVHS deployment plan, the State of Washington is currently pursuing the development of a data fusion algorithm for ATMS/ATIS applications. FHWA's review of the proposed approach reveals that with minimal funding, the proposed encoding scheme may have national application. This funding would partially fund the development of the methodology and investigate possible approaches to enable its national implementation.

START DATE: To be determined.

END DATE: To be determined.

STATUS: A Cooperative Agreement with Washington State Department of Transportation is scheduled to be signed February, 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

EVALUATION OF REAL-TIME TRAFFIC ADAPTIVE SIGNAL CONTROL (RTTASC) PROTOTYPES

DESCRIPTION: This study focuses on the laboratory evaluation of four real-time traffic adaptive signal control prototypes developed by two separate RTTASC contracts and field evaluation of the prototype selected for full development. The original RTTASC study, which was approved for FY 91, consisted of three separate parts with individual contract awards. The first contract requiring the development of a RTTASC prototype by a consortium was awarded in FY 92.

START DATE: To be determined.

END DATE: To be determined.

STATUS: An RFP is scheduled for March, 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

FM/SCA PROTOTYPE FOR TRAFFIC INFORMATION BROADCAST

DESCRIPTION: This project involves the design, development, and preliminary testing of a prototype system to broadcast traffic information to mobile receivers via the Subsidiary Communications Authorization (SCA) Traffic Information Channel (STIC). Such a system will allow the use of commercial FM broadcast station's subcarriers to transmit traffic and other data at rates higher than previously achieved. The data rate for this system will be high enough to support broadcast of individual link travel times (e.g., for routing applications). The completed prototype transmission and reception scheme will be tested, using mostly off-the-shelf-equipment, in several diverse areas to assess concept feasibility.

START DATE: April 1992

END DATE: On-going

STATUS: STIC simulation, laboratory development of the first prototype hardware and firmware, and preliminary testing has been completed. A second prototype incorporating some changes is nearing completion and will be tested during FY 94.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: The MITRE Corporation

CONTACT: Frank Mammano, FHWA R&D, HSR-12, (703) 285-2405

GRAPHICS-BASED INPUT DATA GENERATOR FOR FRESIM

DESCRIPTION:	This study will develop a graphics pre-processor for the FRESIM simulation model.
START DATE:	To be determined.
END DATE:	To be determined.
STATUS:	An Inter-agency Agreement is scheduled to be issued in February, 1994.
ESTIMATED TOTAL PROJECT COST:	N/A
ANTICIPATED TOTAL FEDERAL SHARE:	N/A
FEDERAL FUNDS THROUGH FY 93:	N/A
CONTRACTOR:	To be determined.
CONTACT:	Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

HUMAN FACTORS IN ADVANCED TRAFFIC MANAGEMENT SYSTEMS

DESCRIPTION: The goal of this study is to investigate and define the human factors issues involved in a fully functional, state-of-the-art Advanced Traffic Management System (ATMS). Products of this effort will include the development of a Human Factors Handbook for Traffic Management Center (TMC) Designers, a data base of TMC human factors research and a stand-alone, first generation, human factors research TMC simulator.

START DATE: September 1992

END DATE: December 1995

STATUS: Products from the ongoing requirements analysis include second generation scenarios and system objectives, definition of system functions, allocation of functions and operator performance requirements. Near completion is the comparable systems analysis. The Draft Human Factors Handbook of Traffic Management Systems Design has been submitted and the First Generation Simulator tradeoff study and procurement plan have been completed.

ESTIMATED TOTAL PROJECT COST: $4,216,359

ANTICIPATED TOTAL FEDERAL SHARE: $4,216,359

FEDERAL FUNDS THROUGH FY 93: $4,216,359

CONTRACTOR: Georgia Tech Research Institute, Georgia Institute of Technology

CONTACT: Nazemeh Sobhi, FHWA R&D, HSR-30, (703) 285-2907

HUMAN FACTORS IN ADVANCED TRAVELER INFORMATION SYSTEMS (ATIS) AND COMMERCIAL VEHICLE OPERATIONS (CVO) DESIGN EVOLUTION

DESCRIPTION: The major goal of Advanced Traveler Information Systems (ATIS) is to improve the information that is provided to travelers in urban and rural settings, and under normal, congested, inclement, and emergency conditions. The current project will address the impacts of driver interfaces, information type, behavioral factors, and user demographics on the development of specific information subsystems. These subsystems include In-vehicle Routing and Navigation Systems (IRANS), In-vehicle Motorist Services Information Systems (IMSIS), In-vehicle Signing Information Systems (ISIS), and In-vehicle Safety Advisory and Warning Systems (IVSAWS). Applications specific to CVO focus on the information requirements of commercial vehicle operators. Products of this effort include the development of Human Factors Design Guidelines for in-vehicle ATIS system design, CVO system design, displays common to ATIS and CVO, and displays unique to CVO.

START DATE: October 1992

END DATE: March 1996

STATUS: Literature review of relevant ATIS/CVO design guidelines and projects was completed for the following areas: Development Objectives and Performance Requirements; Functional Description; Task Analysis of ATIS/CVO Functions; and User Information Requirements. A comparable systems analysis has also been accomplished and documented. Empirical research was conducted investigating user acceptance of IVHS technology. Three experiments investigating user acceptance were accomplished and the results were documented in a working paper.

ESTIMATED TOTAL PROJECT COST: $5,251,337

ANTICIPATED TOTAL FEDERAL SHARE: $5,251,337

FEDERAL FUNDS THROUGH FY 93: $5,251,337

CONTRACTOR: Battelle Human Affairs Research Center

CONTACT: Truman Mast, FHWA R&D, HSR-30, (703) 285-2404

IN-VEHICLE ADVISORY AND WARNING SYSTEMS

DESCRIPTION: Techniques are being investigated for providing in-vehicle warnings for various roadway hazards, at a point sufficiently upstream from the hazard to enable the driver to take appropriate action. Hazard warnings transmitters are envisioned which can be deployed either temporarily or permanently. The technical portion of the effort consists of an analysis of potential scenarios for such a system,an assessment of possible benefits, derivation of functional and technical requirements, development of technical system concepts, subsystem level validation of system concepts, and recommendations for an optimal system implementation as part of a total in-vehicle motorist information package. In addition, human factors testing is being conducted to evaluate various Driver Alert Warning Systems.

START DATE: September 1, 1990

END DATE: May 31, 1994

STATUS: The contractor initially proposed a two-way spread spectrum communication link as the baseline communications architecture. However, the results of a separate FHWA effort concluded that this wideband approach was not feasible due to lack of available spectrum. The effort is being modified to re-evaluate the approach based on spectrum availability, false alarm rate, and the use of GPS. Several candidate system concepts based upon a more in-depth requirements definition process will be identified.

ESTIMATED TOTAL PROJECT COST: $936,006

ANTICIPATED TOTAL FEDERAL SHARE: $936,006

FEDERAL FUNDS THROUGH FY 93: $936,006

CONTRACTOR: Hughes Ground Systems Group

CONTACT: Milton K. Mills, FHWA R&D, HSR-10, (703) 285-2402

IN-VEHICLE SIGNING

DESCRIPTION: This study will support investigations into the technologies and issues associated with In-Vehicle Signing (IVS) systems which shall be conducted by a National Laboratory. Benefit analysis of IVS shall be conducted within the first three months of the study to guide decisions for future efforts. Additionally, definition of functional requirements and system/concept analysis shall be performed. If the benefits warrant continuation, the national laboratory will then assist FHWA in acquiring a consortium to further develop, test, and make available for deployment an operational IVS system.

START DATE: To be determined.

END DATE: To be determined.

STATUS: An inter-agency agreement will be negotiated with a Federal agency or national laboratory.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: James Arnold, FHWA R&D, HSR-10, (703) 285-2974

INCIDENT DETECTION ISSUES

DESCRIPTION: The objective of this activity is to examine the entire issue of automatic incident detection on freeways, including: (1) new technology such as expert systems, neural networks, etc., and (2) alternate detection technology such as Wide Area Detection Systems (WADS). In addition, the issue of developing procedures for quantifying the effects of incidents and incident management techniques will be examined.

START DATE: April 20, 1993

END DATE: April 20, 1997

STATUS: The contractor has completed a state-of-the-art review of automatic freeway incident detection which examined and evaluated existing incident detection systems and determined deficiencies in current incident detection practices.

ESTIMATED TOTAL PROJECT COST: $1,592,322

ANTICIPATED TOTAL FEDERAL SHARE: $1,592,322

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: Ball Engineering

CONTACT: Stephen L. Cohen, FHWA R&D, HSR-11, (703) 285-2091

INTEGRATION OF TRAFFIC OPERATIONS AND TRAFFIC DATA COLLECTIONS

DESCRIPTION:	This research will establish a process and methodology for the integrated collection of traffic data. This research is expected to result in increased awareness of organizational objectives and increased cooperation between traffic engineering/operations staff and the traffic data collection efforts of the transportation planning programs at both the local and State levels. Georgia DOT and Washington State DOT have been scheduled to conduct this study.
START DATE:	July 1993
END DATE:	December 1995
STATUS:	The project is underway.
ESTIMATED TOTAL PROJECT COST:	$495,000
ANTICIPATED TOTAL FEDERAL SHARE:	$495,000
FEDERAL FUNDS THROUGH FY 93:	$345,000
CONTRACTOR:	Georgia DOT and Washington State DOT
CONTACT:	Ed Kashuba, FHWA, HPM-30, (202) 366-0175 Aladdin Barkawi, FHWA, HSR-11, (703) 285-2093

MODELS TO SIMULATE IVHS OPERATIONS

DESCRIPTION:	This activity will modify existing traffic models to simulate IVHS operations such as real-time control strategies, route guidance capabilities, real-time graphics displays, environmental and safety measures of effectiveness, effects of in-vehicle navigation systems, probe vehicle/path selection capabilities, and user interfaces. As a minor effort, this activity will also examine the feasibility and applicability of incorporating advanced analytic techniques (such as image processing, neural networks, parallel processing, control theory, and real-time distributed systems) into the models.
START DATE:	February 3, 1994
END DATE:	February 3, 1999
STATUS:	Contract awarded in February 1994.
ESTIMATED TOTAL PROJECT COST:	$2,007,445
ANTICIPATED TOTAL FEDERAL SHARE:	$2,007,445
FEDERAL FUNDS THROUGH FY 93:	$0
CONTRACTOR:	Kaman Sciences
CONTACT:	Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

MOTORIST AID SYSTEM ASSESSMENT

DESCRIPTION:	This is a comprehensive nationwide assessment of motorist aid systems. This will include a listing of what systems are currently considered operational, their location, highway classification, number of sites in the system, year placed in service, system prime contractor and major subcontractors, funding sources, maintenance responsibility, response agencies, communications technologies, power modes, and tradeoffs between data and voice call box systems.
START DATE:	September 28, 1992
END DATE:	June 30, 1994
STATUS:	Underway
ESTIMATED TOTAL PROJECT COST:	$130,000
ANTICIPATED TOTAL FEDERAL SHARE:	$100,000
FEDERAL FUNDS THROUGH FY 93:	$100,000
CONTRACTOR:	TITAN Advanced Digital Systems (Attn: Bruce Churchill)
CONTACT:	Jerry Emerson, FHWA Headquarters, HTV-31, (202) 366-2221

NETWORK-WIDE OPTIMIZATION

DESCRIPTION: The objective of this contract is to develop a computer package which will allow users to: (1) coordinate the signal timing and ramp metering functions, (2) develop metering rates for metered freeway on-ramps, (3) optimize signal timing at isolated intersections, on arterials, and in closed networks. In addition, a WINDOWS-based user interface based on a graphical users interface utilizing point-and-click technology will be developed for this package.

START DATE: November 15, 1992

END DATE: November 15, 1995

STATUS: The contractor has submitted a working paper for FHWA review evaluating the TRANSYT-7F technical capabilities, the accuracy and usefulness of existing program documentation and recommendations for modifications or enhancements.

ESTIMATED TOTAL PROJECT COST: $1,403,000

ANTICIPATED TOTAL FEDERAL SHARE: $1,403,000

FEDERAL FUNDS THROUGH FY 93: $1,403,000

CONTRACTOR: Farradyne Systems, Inc.

CONTACT: Stephen L. Cohen, FHWA R&D, HSR-11, (703) 285-2091

NORTH SEATTLE ADVANCED TRAFFIC MANAGEMENT SYSTEM (ATMS)

DESCRIPTION: This project will explore methods for adjacent traffic signal systems to share loop detector and operational data to improve operations across boundaries and between adjacent systems. Jurisdictional issues which often prevent coordinating adjacent systems will be addressed during this project. Data will be obtained from several systems in the I-5 corridor north of Seattle by a single microcomputer connected with street or central master controllers belonging to the various jurisdictions within the corridor. The microcomputer will compile the volume, occupancy and operations data and transmit it back to the participating control systems. Each system will then use the data to improve its traffic management capabilities.

START DATE: March 1994 (anticipated)

END DATE: March 1996

STATUS: Farradyne Inc. has been selected as the contractor and negotiations began in February, 1994. Work is expected to begin in March, 1994.

ESTIMATED TOTAL PROJECT COST: $4,400,000

ANTICIPATED TOTAL FEDERAL SHARE: $3,500,000

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: Farradyne, Inc.

CONTACT: Ed Fischer, FHWA, Region 10, (503) 326-2071
Dave Berg, WSDOT Project Manager, (206) 440-4485

OPERATIONAL EVALUATION OF SCOOT IN SOUTHERN CALIFORNIA

DESCRIPTION:	This study will be carried out in Anaheim, California, in coordination with an ongoing operational test and will evaluate the adaptability and applicability of the British Split Cycle and Offset Optimization Technique (SCOOT) system for IVHS-type systems.
START DATE:	N/A
END DATE:	N/A
STATUS:	A Cooperative Agreement is scheduled for April, 1994.
ESTIMATED TOTAL PROJECT COST:	N/A
ANTICIPATED TOTAL FEDERAL SHARE:	$600,000
FEDERAL FUNDS THROUGH FY 93:	N/A
CONTRACTOR:	To be determined.
CONTACT:	Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

REAL-TIME TRAFFIC ADAPTIVE CONTROL FOR IVHS

DESCRIPTION: This study, to develop a prototype real-time, traffic adaptive signal control system suitable for use in an IVHS environment by 1997, is the first of three studies which will eventually develop four prototypes for laboratory evaluation, from which one will be selected for further development and field evaluation by 1997. This study encompasses the first stage of a long term effort. A single, major contract was awarded to a consortium composed of State and local DOT's, private industry, and academia.

START DATE: July 1992

END DATE: July 1997

STATUS: The contractor has prepared preliminary functional design specifications for the system. Review of state-of-the-art signal system technologies for applicability to the development of the real-time traffic adaptive control system is being performed. Modifications to off-line optimization software needed to support real-time control will be investigated.

ESTIMATED TOTAL PROJECT COST: $4,915,852

ANTICIPATED TOTAL FEDERAL SHARE: $3,403,382

FEDERAL FUNDS THROUGH FY 93: $3,403,382

CONTRACTOR: The contract was awarded to a consortium composed of State and local DOT's, industry, and academic organizations. The prime contractor is Farradyne Systems, Inc.

CONTACT: James E. Clark, FHWA R&D, HSR-11, (703) 285-2681

RESPONSIVE MULTI-MODAL TRANSPORTATION MANAGEMENT STRATEGIES

DESCRIPTION: Within the context of multi-modal transportation management the objectives of this contracts are: (1) identify candidate real or semi-real time scenarios; (2) determine their usefulness and feasibility; (3) develop new concepts: (4) evaluate the potential utility and cost of each scenario; and (5) provide recommendations for additional research, development, and operational test activities.

START DATE: September 1991

END DATE: April 1994

STATUS: Review of the final report is currently underway by panel members. The final report should be available in the summer of 1994.

ESTIMATED TOTAL PROJECT COST: $301,295

ANTICIPATED TOTAL FEDERAL SHARE: $301,295

FEDERAL FUNDS THROUGH FY 93: $301,295

CONTRACTOR: Bellomo-McGee, Inc.

CONTACT: Aladdin Barkawi, FHWA R&D, HSR-11, (703) 285-2093

REVISED PLANNING METHODOLOGY FOR SIGNALIZED INTERSECTION AND OPERATIONS

DESCRIPTION:	Develop specific recommendations on text, tables, and illustrative materials adequate to revise the methodology for analyzing exclusive left-turn lanes on Chapter 9 of the HCM. Develop a more appropriate traffic model for the operational analysis of exclusive left-turn lanes.
START DATE:	September 23, 1992
END DATE:	June 23, 1995
STATUS:	The contractor has recommended a new traffic model, and is presently preparing for data collection.
ESTIMATED TOTAL PROJECT COST:	$209,717
ANTICIPATED TOTAL FEDERAL SHARE:	$10,000 pooled fund study
FEDERAL FUNDS THROUGH FY 93:	$0
CONTRACTOR:	University of Maryland
CONTACT:	Cesar Perez, FHWA R&D, HSR-10, (703) 285-2408

RURAL APPLICATIONS OF ADVANCED TRAVELER INFORMATION SYSTEMS

DESCRIPTION: This study will develop an Advanced Traveler Information System(s) (ATIS) for rural applications. The research will examine a broad range of rural environments, categories of travelers, ATIS applications, and advanced electronic and communication technologies. The study involves determining the needs for ATIS services in rural and small urban areas and developing the functional requirements for providing them. The feasibility and cost-effectiveness of alternative applications and Advanced Traveler Information Systems related technologies will be assessed. Alternative system designs for the promising applications and technologies will be developed and evaluated. Based upon these analyses, priorities and plans for subsequent prototyping and operational field testing will be developed. An engineering prototype of one or more of the most promising rural ATIS design alternatives will be developed and tested in a limited rural environment.

START DATE: January 19, 1993

END DATE: July 19, 1995

STATUS: Focus group discussions and telephone survey of rural travel needs and concerns have been completed. A preliminary assessment of technologies and applications to meet rural travel needs is nearing completion.

ESTIMATED TOTAL PROJECT COST: $1,536,000

ANTICIPATED TOTAL FEDERAL SHARE: $1,038,500

FEDERAL FUNDS THROUGH FY 93: $1,038,500

CONTRACTOR: JHK & Associates (lead), Hughes, Virginia Tech, Bell-Atlantic

CONTACT: Davey Warren, FHWA R&D, HSR-10, (703) 285-2426

TRAFFIC ENGINEERING INFORMATION DATABASES

DESCRIPTION: This project will lead to the development of requirements for databases which contain information on traffic simulation software (e.g., NETSIM, Highway Capacity Manual) and research, development and support activities related to this software and other IVHS-related traffic operations issues (e.g., demand and incident management).

START DATE: December 1993

END DATE: December 1994

STATUS: This effort is underway. The contractor is developing a user friendly, computerized data base and delivery system for providing comprehensive traffic engineering information.

ESTIMATED TOTAL PROJECT COST: $150,000

ANTICIPATED TOTAL FEDERAL SHARE: $150,000

FEDERAL FUNDS THROUGH FY 93: $150,000

CONTRACTOR: Oak Ridge National Laboratory (ORNL), Dave Middendorf, P.I.

CONTACT: Dan Schierer, FHWA Headquarters, HTV-32, (202) 366-4672

TRAFFIC MANAGEMENT LABORATORY

DESCRIPTION: This contract will provide support services to develop, implement, and support a critical additional capability to the Traffic Management Laboratory at FHWA's Turner-Fairbank Highway Research Center. This effort will provide an off-line, pre-deployment capability which enables the testing, evaluation, and calibration of newly developed traffic control strategies, support systems, multi-modal transportation strategies, traffic management center hardware/software configurations, as well as the development of a performance trade-off analysis database. This contract will also complement the existing on-site traffic modelling expertise with systems engineering expertise, database technologies, real-time systems, and hardware and software communication expertise.

START DATE: September 30, 1993

END DATE: September 30, 1997

STATUS: A technical requirements document for the laboratories is being prepared by the contractor.

ESTIMATED TOTAL PROJECT COST: $2,999,865

ANTICIPATED TOTAL FEDERAL SHARE: $2,999,865

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: Information Dynamics, Inc.

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

TRAFFIC MANAGEMENT LABORATORY AND R&D SUPPORT FOR THE IVHS

DESCRIPTION: This contract will establish a capability for a traffic management laboratory, provide technical assistance and program support for the FHWA/IVHS Research Division in the areas of traffic modelling, control, evaluation of proposal and contract deliverables.

START DATE: May 22, 1992

END DATE: May 22, 1995

STATUS: Under this effort, enhancements to various traffic models have been achieved (TRAF-NETSIM version 4.0, CORFLO and FRESIM). A current effort under this contract is the enhancement of a surface street/freeway model known as CORSIM.

ESTIMATED TOTAL PROJECT COST: $3,466,998

ANTICIPATED TOTAL FEDERAL SHARE: $3,466,998

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: Information Dynamics, Inc.

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

TRAFFIC MANAGEMENT TECHNICAL DESIGN REVIEWS AND WORKSHOPS

DESCRIPTION: This study will establish a formal working relationship between selected practitioners and FHWA's staff. Focus groups will be formed for real-time signal control, traffic management laboratory, incident detection, and dynamic traffic assignment. These groups will provide FHWA with assistance on (1) deployment issues of R&D prototypes; (2) evaluating state-of-the-art vs. state-of-the-practice; (3) product design/evaluations; and (4) automation needs. This formal relationship ensures that practitioners participate in the design and development of IVHS technologies so that they will be amenable to field deployment.

START DATE: To be determined.

END DATE: To be determined.

STATUS: An RFP is scheduled to be issued in March 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

TRAFFIC MODELING TO SUPPORT ADVANCED TRAVELER INFORMATION SYSTEMS (ATIS)

DESCRIPTION: The scope of this study consists of two parts: (1) design a dynamic traffic assignment/simulation model suitable for developing real-time diversion strategies for in-vehicle route guidance systems and (2) complete the development of the CORFLO simulation model.

START DATE: October 15, 1990

END DATE: March 15, 1994

STATUS: The development of the CORFLO model was completed and released to the public in July, 1992. The literature review has been completed including an evaluation of parallel processing computers. The formulation of the dynamic assignment model and the simulator has been completed. A prototype of the independent components of the system was developed to test their computational efficiency and applicability to real-time operation. The contract will also investigate implementation issues of the model.

ESTIMATED TOTAL PROJECT COST: $559,016

ANTICIPATED TOTAL FEDERAL SHARE: $559,016

FEDERAL FUNDS THROUGH FY 93: $559,016

CONTRACTOR: University of Texas

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

TRAFFIC MODELS FOR TESTING REAL-TIME, TRAFFIC-ADAPTIVE SIGNAL CONTROL LOGIC: PHASE I

DESCRIPTION: This study will develop modified versions of the TRAF-NETSIM simulation model and the GTRAF graphics software that will enable the interactive, off-line testing of real-time, traffic-adaptive signal control methods in a microcomputer environment. The modified software will then be implemented into an operational Urban Traffic Control Systems (UTCS) control center to provide system operators with real-time measures of effectiveness on the performance of the network under UTCS control.

START DATE: September 1992

END DATE: August 1996

STATUS: KLD Associates is currently working on the interface software logic between signal controllers and the NETSIM simulation model.

ESTIMATED TOTAL PROJECT COST: $878,924

ANTICIPATED TOTAL FEDERAL SHARE: $878,924

FEDERAL FUNDS THROUGH FY 93: $878,924

CONTRACTOR: KLD Associates, Inc.

CONTACT: Henry Lieu, FHWA R&D, HSR-11, (703) 285-2410

WIDE AREA SURVEILLANCE SYSTEMS

DESCRIPTION: This effort will provide an initial feasibility assessment of promising technical approaches for wide area surveillance systems for IVHS Advanced Traffic Management Systems (ATMS) systems. This long standing system need has not been adequately met and several National Labs have demonstrated various promising approaches. This study will also examine passive versus active detection issues, and explore the feasibility of integrating Wide Area Surveillance Systems with existing surveillance systems.

START DATE: April 1993

END DATE: April 1995

STATUS: Work is underway examining passive versus active detection issues.

ESTIMATED TOTAL PROJECT COST: $351,000

ANTICIPATED TOTAL FEDERAL SHARE: $351,000

FEDERAL FUNDS THROUGH FY 93: $351,000

CONTRACTOR: Oak Ridge National Laboratory (ORNL)

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2093
Chip White, University of Michigan, (313) 763-1332

Travel and Traffic Management

(Operational Test)

ADVANCE

LOCATION: Northwest suburbs of Chicago, Illinois

PARTNERS: Illinois Department of Transportation (IDOT), Motorola Inc., Illinois Universities Transportation Research Consortium (IUTRC), FHWA

START DATE: 1991

END DATE: 1996

DESCRIPTION: ADVANCE (Advanced Driver and Vehicle Advisory Navigation Concept) is a cooperative effort to evaluate the performance of the first large-scale dynamic route guidance system in the United States. Up to 5,000 private and commercial vehicles in the northwestern suburbs of Chicago will be equipped with in-vehicle navigation and route guidance systems. Vehicles will serve as probes, providing real-time traffic information to a Traffic Information Center. This information will be processed and then transmitted to the equipped vehicles and used to develop a preferred route. The routing information will be presented to the driver in the form of dynamic routing instructions.

STATUS: The initial phase of designing the components of ADVANCE (the mobile navigation assistant, the Traffic Information Center, the communications subsystem, etc.) should be completed in spring 1994. A fleet of approximately 20 vehicles will then begin initial testing and "shake-down" of the ADVANCE system. Equipping of the up to 5,000 vehicles and the start of project operations should begin in fall 1994.

ESTIMATED TOTAL PROJECT COST: $52,000,000

ANTICIPATED TOTAL FEDERAL SHARE: $36,000,000

FEDERAL FUNDS THROUGH FY 93: $21,000,000

CONTACTS: Robert Rupert, FHWA Headquarters, HTV-20, (202) 366-2194
Martin Monahan, FHWA Region 5, HE0-05, (708) 206-3218
Joe Ligas, Illinois DOT, (708) 705-4800

ADVANCED RIDESHARING AND TRAVELER INFORMATION SYSTEM

LOCATION: Northern Virginia

PARTNERS: Potomac Rappahannock Transportation Commission (PRTC), Northern Virginia Planning District Commission, Virginia Department of Rail and Public Transportation (VDRPT), Gandalf Mobile Systems, UMA Engineering, Aegis Transportation Information Systems, SG Associates, FTA, FHWA

START DATE: January 1994

END DATE: July 1996

DESCRIPTION: This Operational Test will evaluate an enhanced, ridesharing-route deviation transportation system integrated with conventional transit and ridesharing in the Northern Virginia suburbs of Washington, D.C. including Prince William and Stafford Counties. The system will provide on-demand service through an audiotex request system which uses scheduling software similar to the taxi industry. Depending on the needs and preferences of the system user, door-to-door transportation would be provided using both public and privately owned vehicles operated by paid volunteer drivers using vans, minibuses, specialized public vehicles, fixed-route buses, and taxicabs. Users would be charged a standard per-mile rate regardless of the type of vehicle used. System cost not recovered by these fares would be covered by local agencies. Smart cards will be used to process transactions. It is hypothesized that this services could be provided at a much lower cost than conventional transit service. It is expected that a dispatch center will be established and 50 vehicles will be equipped. Technologies are expected to include Automatic Vehicle Location (AVL) and Global Positioning System (GPS) satellites, interactive cable TV, and electronic bulletin boards.

STATUS: An agreement was signed by the VDRPT and the FHWA in January 1994 to initiate the project.
After this initial operational test, full scale deployment will be considered for specified elements of this ridesharing and traveler information system.

ADVANCED RIDESHARING AND TRAVELER INFORMATION SYSTEM (cont.)

ESTIMATED TOTAL PROJECT COST:	$6,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$1,600,000
FEDERAL FUNDS THROUGH FY 93:	$0
CONTACT:	Ron Boenau, FTA Headquarters, TTS-32, (202) 366-0195 Bill LaBaugh, Virginia Department of Rail and Public Transportation, (804) 225-3939

BELLEVUE SMART TRAVELER

LOCATION: Metropolitan Seattle

PARTNERS: Federal Transit Administration (FTA), Bellevue Transportation Management Association (TransManage), University of Washington, City of Bellevue, Washington State DOT

START DATE: October 1991

END DATE: September 1994

DESCRIPTION: This project examines ways in which mobile communications, such as cellular phones, and information kiosks can be used to make ridesharing (carpooling and vanpooling) more attractive and is evaluating a Traveler Information System. A set of information-based services for ridematching was developed in Phase I in cooperation with the mobile telecommunications industry in an effort to increase the use of HOV facilities. The initial focus advised private auto drivers of rideshare possibilities using mobile communications. A second phase is operationally testing a prototype computer-based, interactive commuter information center in an office building in downtown Bellevue. The center will provide computerized transit information, rideshare matching, and a method to schedule occasional carpool or vanpool trips. In addition to cellular telephone, the technological applications include voice mail, computer-based ridematching, "smart" ID cards, traffic monitoring computers and electronic maps.

STATUS: Phase I determined that there is a potential for the use of cellular telecommunications and voice mail ridesharing, although no incentive was found for existing carpools/ vanpools. It was found that 42 percent of "drive alone" commuters would consider "instant ridesharing." Phase II, currently underway, is now developing prototypes of traveler information center features for inclusion in the traveler information center and has installed a kiosk in a major downtown Bellevue office complex.

Operational tests of various approaches to establishing Traveler Information Centers will be developed.

BELLEVUE SMART TRAVELER (cont.)

ESTIMATED TOTAL PROJECT COST:	$300,000
ANTICIPATED TOTAL FEDERAL SHARE:	$144,000
FEDERAL FUNDS THROUGH FY 93:	$144,000
CONTACT:	Ronald Boenau, FTA Headquarters, TTS-32, (202) 366-0195 Mark Haselkorn, University of Washington, (206) 543-2577 Cathy Blumenthel, TransManage TMA, (206) 453-0644

BORMAN EXPRESSWAY ADVANCED TRAFFIC MANAGEMENT SYSTEMS (ATMS)

LOCATION: Borman Expressway (I-80/94), northwest Indiana

PARTNERS: FHWA, Indiana Department of Transportation (INDOT)

START DATE: July 1994

END DATE: April 1995

DESCRIPTION: INDOT, in conjunction with Hughes Transportation Systems/JHK/Avilla, is developing and installing a functioning prototype Advanced Traffic Management Systems (ATMS) deploying several of the more promising electronic sensors and integrating them into the prototype using spread spectrum radio communications. The equipment will be independently evaluated for dependability and cost effectiveness by Purdue University before being incorporated into the permanent ATMS that will be constructed in a later phase. The Borman ATMS will become an essential component of the Gary-Chicago-Milwaukee, Midwest Priority IVHS Corridor.

STATUS: Partnership agreement has been executed and work orders are being finalized.

ESTIMATED TOTAL PROJECT COST: $1,750,000

ANTICIPATED TOTAL FEDERAL SHARE: $550,000

FEDERAL FUNDS THROUGH FY 93: $550,000

CONTACT: Martin Monahan, FHWA Region 5, HEO-05, (708) 206-3218
Dan Shamo, Freeway Management Engineer, INDOT, La Porte District, (219) 362-6125

BOSTON SMART TRAVELER

LOCATION: Boston, Massachusetts

PARTNERS: Project contributors include the FHWA, the Massachusetts Highway Department, SmartRoute Systems. Several local radio and television stations will donate advertising and promotion for the project.

START DATE: September 1992

END DATE: December 1993

DESCRIPTION: The project tested the public acceptance and potential traffic impacts of a telephone-based audiotext traffic information service. An independent evaluation of the project was done and the final report available. The state and FHWA have determined that the project needs more time to achieve wider-scale public acceptance and, therefore, the project is being continued for another year with State Planning and Research (SPR) funding.

STATUS: The IVHS-funded operational test was completed on December 31, 1993. The project is continuing for another 12 months as an SPR-funded project.

ESTIMATED TOTAL PROJECT COST: $3,000,000

ANTICIPATED TOTAL FEDERAL SHARE: $2,715,000

FEDERAL FUNDS THROUGH FY 93: $2,715,000

CONTACT: Jonathan McDade, FHWA Region 1, HPP-01, (518) 472-4253
Edward Silva, FHWA Massachusetts Division, (617) 973-7313
Daniel Beagan, Massachusetts Highway Department, (617) 973-7313

CALIFORNIA SMART TRAVELER

LOCATION: Multiple sites in California

PARTNERS: FTA, Santa Clara County Transportation Authority, Southern California Regional Transit District, Volpe National Transportation Systems Center, Aegis Transportation Information Systems, Inc., Merced County Council of Government, University of California, California Department of Transportation.

START DATE: October 1990

END DATE: September 1994

DESCRIPTION: This major project is comprised of several components which include (a) Los Angeles Smart Traveler, (b) Los Angeles Smart Card, (c) Orange County Smart Intermodal System, (d) Santa Clara County Smart Vehicle, and (e) Sacramento Real-time Ridesharing. The Los Angeles Smart Traveler will be able to provide pre-trip, real-time planning information including transit system status and expected arrival times. The Los Angeles Smart Card will test the use of smart cards for express transit services as well as for parking and other services at employment sites. The Orange County Smart Intermodal System will operationally test (1) an integrated transit and traffic management system and (2) a real-time information system that will include special event information. A Santa Clara County Smart Vehicle will use global positioning system (GPS) technology for automatic vehicle location (AVL) operation of a paratransit system in conjunction with bus, light-rail, and train operation. The Sacramento Real-time Ridesharing component will use a geographic information system to provide real-time ridesharing and will include driver incentives.

STATUS: The first phase of the project has been completed which evaluated various test sites and technologies. Five sites have been identified for operational design and testing. A report has been prepared describing a California Smart Traveler Information Network which uses audiotex and videotex for carpool matching services.

Future activities are expected to test some early action opportunities for dynamic ride-matching. A laboratory for testing and evaluating technological components and systems for larger field operational tests is being developed.

CALIFORNIA SMART TRAVELER (cont.)

ESTIMATED TOTAL PROJECT COST:	$10,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$4,000,000
FEDERAL FUNDS THROUGH FY 93:	$355,000
CONTACT:	Ronald Boenau, FTA Headquarters, TTS-32, (202) 366-0195 Robert Ratcliff, California Department of Transportation, (916) 654-8367

"CAPITAL" - WASHINGTON, D.C. AREA OPERATIONAL TEST

LOCATION: Washington, D.C. metropolitan area

PARTNERS: FHWA, Virginia Department of Transportation (VDOT), Maryland State Highway Administration (MSHA), Engineering Research Associates, Bell Atlantic Mobile Systems, Farradyne Systems Inc., Washington Metropolitan Council of Governments, and the National Park Service.

START DATE: August 1993

END DATE: March 1995

DESCRIPTION: This IVHS Operational Test makes extensive use of the existing cellular infrastructure for both areawide surveillance and communications. ERA equipment is being collocated on Bell Mobile towers to collect cellular usage and geolocate phones on designated roadways. Specific evaluation goals include to determine the: accuracy of geolocation data; accuracy in completeness of traffic information; usefulness of passive statistical processing for measuring volume and incidents; criteria for selecting roadways that can be monitored by these techniques; systems' capabilities; costs for deployment; public acceptance; and usefulness of information dissemination to fleet vehicles.

STATUS: "Operational test" phase is scheduled between April and September 1994. A decision on additional geographic coverage will be made at the end of the test.

ESTIMATED TOTAL PROJECT COST: $7,169,420

ANTICIPATED TOTAL FEDERAL SHARE: $5,511,733

FEDERAL FUNDS THROUGH FY 93: $5,511,733

"CAPITAL" - WASHINGTON, D.C. AREA OPERATIONAL TEST (cont.)

CONTACT:

Bob Ewald, ERA, (703) 734-8858
Jim Robinson, FHWA Region 3, HEO-03, (410) 962-3815
Charles Hall, Virginia DOT, (804) 786-6777
Steve Kuciemba, MSHA, (410) 787-5884

CONNECTICUT FREEWAY ADVANCED TRAFFIC MANAGEMENT SYSTEMS (ATMS)

LOCATION:	Hartford, Connecticut
PARTNERS:	FHWA, Connecticut DOT
START DATE:	1992
END DATE:	1994
DESCRIPTION:	This ATMS project will evaluate the use of roadside mounted radar detectors in combination with closed circuit television (CCTV) for incident detection and verification. The ATMS utilizes 44 radar detectors (wide- and narrow-beam) and compressed video.
STATUS:	The construction of the system is complete. System acceptance and evaluation will take place in 1994.
ESTIMATED TOTAL PROJECT COST:	$1,300,000
ANTICIPATED TOTAL FEDERAL SHARE:	$835,000
FEDERAL FUNDS THROUGH FY 93:	$770,000
CONTACT:	Jonathan McDade, FHWA Region 1, HPP-01, (518) 472-4253 ext. 254 Al Alonzi, FHWA CT Division, HPR-CT, (203) 240-3693 James Mona, CTDOT, (203) 566-3590

DIRECT

LOCATION: Along 21 miles of I-94, Detroit, Mich.

PARTNERS: Michigan DOT, FHWA, various private equipment donors including GM, Ford, Chrysler, Delco, Ericsson/GE, REA America

START DATE: 1991

END DATE: 1995

DESCRIPTION: DIRECT (Driver Information Radio Experimenting with Communication Technology) is a 36-month Operational Field Test that will deploy and evaluate several alternative low cost methods of communicating advisory information to motorists. These include use of the Radio Data System (RDS), television subcarrier, Automatic Highway Advisory Radio (AHAR), Low Power Highway Advisory Radio (HAR), and cellular phone call-in.

A Metropolitan Transportation Center will collect traffic information from various sources and provide traffic updates to travelers on an exception basis. Initial experimental testing will involve 30 specially-equipped vehicles; subsequent testing will involve additional vehicles using conventional equipment (AM radio and cellular phone). Other features of the project include comparison and evaluation of several types of traffic detectors (microwave, infrared, and video, in addition to loops) and incident detection algorithms.

STATUS: DIRECT has recently passed the preliminary design phase. Procurement of all components of the system are being prepared.

ESTIMATED TOTAL PROJECT COST: $5,000,000

ANTICIPATED TOTAL FEDERAL SHARE: $2,500,000

FEDERAL FUNDS THROUGH FY 93: $700,000

CONTACT: Martin Monahan, FHWA Region 5, HRA-05, (708) 206-3218

DYNAMIC TRUCK SPEED WARNING FOR LONG DOWNGRADES

LOCATION: Colorado

PARTNERS: Colorado DOT, Colorado Motor Carriers' Association, International Road Dynamics

START DATE: June 1993

END DATE: December 1994

DESCRIPTION: This project provides for the installation of a weigh-in-motion station to determine the weight of each truck passing the site, ignoring vehicles under 30,000 pounds GVW, and installation of loops to determine vehicle speed. Using the weight and speed, the safe descent speed will be computed from the algorithm published in FHWA-RD-79-116 "Feasibility of a Grade Severity Rating System" as modified by "The Development and Evaluation of a Prototype Grade Severity Rating System". The vehicles will be advised of the safe speed using variable message signs. The test will be conducted on the I-10 downgrade, west of the Eisenhower Tunnel.

STATUS: Preliminary design work is underway. Due to weather conditions at this high mountain pass construction cannot begin until summer. The system is expected to be operational by midsummer 1994.

ESTIMATED TOTAL PROJECT COST: $250,000

ANTICIPATED TOTAL FEDERAL SHARE: $195,000

FEDERAL FUNDS THROUGH FY 93: $195,000

CONTACT: C.P. Damon, FHWA Region 8, HPD-08, (303) 969-6712
Tim Penny, FHWA Colorado Division, (303) 969-6737
Matthew Rhey, CDOT District 1, (303) 757-9111

ELECTRONIC TOLL AND TRAFFIC MANAGEMENT

LOCATION: Major New Jersey toll roads

PARTNERS: FHWA, New Jersey Department of Transportation (NJDOT), New Jersey Highway Authority, New Jersey Turnpike Authority, South Jersey Transportation Authority

START DATE: 1992

END DATE: On-going

DESCRIPTION: The implementation of Electronic Toll and Traffic Management (ETTM) technology on three New Jersey toll authorities will permit commuters to use "electronic tags" on their vehicles which will be recognized by tag readers located in the toll lanes. The three agencies are cooperating members of an inter-agency effort known as EZ-Pass which will select a single ETTM system to be deployed region-wide and permit motorists to use a single electronic tag throughout the region.

STATUS: ETTM projects on the Garden State Parkway and Atlantic City Expressway are currently under design. It is anticipated that the Atlantic City Expressway ETTM system will be authorized for construction in FY 94.

ESTIMATED TOTAL PROJECT COST: $31,250,000

ANTICIPATED TOTAL FEDERAL SHARE: $25,000,000

FEDERAL FUNDS THROUGH FY 93: $25,000,000

CONTACT: Jonathan McDade, FHWA Reg. 1, HPP-01, (518) 472-4253
Gary Corino, FHWA New Jersey, DET-NJ, (609) 989-2274
Allan Samour, New Jersey DOT, (609) 530-3797

FAST-TRAC

LOCATION: Oakland County, Michigan

PARTNERS: FHWA, Michigan DOT, Siemens Automotive, GM, Ford, Chrysler, Road Commission for Oakland County (RCOC), County of Oakland, AWA Traffic System - America, University of Michigan.

START DATE: April 7, 1992

END DATE: January 1, 1996

DESCRIPTION: FAST-TRAC (Faster and Safer Travel through Traffic Routing and Advanced Controls) will combine Advanced Traffic Management Systems and Advanced Traveler Information Systems technologies in Oakland County, Michigan. The Australian SCATS traffic adaptive control system will be installed throughout Oakland County, Michigan. Traffic detection for real time traffic control will be provided using Autoscope video image processing technology. For the Advanced Traveler Information Systems part of the test, vehicles will be equipped with the Siemens Ali-Scout route guidance and driver information system. Infrared beacons will be installed at critical locations in the network to provide for a continuous exchange of real time traffic and route guidance information. A Traffic Operations Center has been established, not only as the heart of FAST-TRAC operations, but also as the focus for systems integration.

STATUS: One hundred intersections are under SCATS control and nearly one hundred more will be placed in operation by June, 1994. Testing of the Ali-Scout system has begun.

ESTIMATED TOTAL PROJECT COST: $100,000,000

ANTICIPATED TOTAL FEDERAL SHARE: $40,500,000

FEDERAL FUNDS THROUGH FY 93: $40,500,000

CONTACT: Jim Barbaresso, RCOC, (313) 645-2000
Martin Monahan, FHWA Region 5, HEO-05, (708) 206-3218
Morris Hoevel, FHWA Michigan Division, (517) 377-1880

GENESIS

LOCATION:	Minneapolis/St. Paul, Minnesota
PARTNERS:	FHWA, Minnesota Department of Transportation (MnDOT), Motorola Center for Transportation Studies, University of Minnesota
START DATE:	1993
END DATE:	1996
DESCRIPTION:	The Genesis project will test and evaluate the value of a portable digital personal communications device (PCD) in improving transportation service. The PCD will provide users with real-time, route-specific information on operating conditions of highways and mass transit systems, along with other types of personal-use information.
STATUS:	Consultant design team, software consultant, and evaluation contractor have been selected. Design documents are nearing completion.
ESTIMATED TOTAL PROJECT COST:	$3,200,000
ANTICIPATED TOTAL FEDERAL SHARE:	$2,400,000
FEDERAL FUNDS THROUGH FY 93:	$2,400,000
CONTACT:	Martin J. Monahan, FHWA Region 5, HEO-05, (708) 206-3218 Ray Starr, Minnesota DOT, (612) 296-7596

HOUSTON SMART COMMUTER

LOCATION: Harris County, Texas

PARTNERS: FTA, FHWA, Texas Department of Highways and Public Transportation, Texas Transportation Institute

START DATE: 1992

END DATE: 1995

DESCRIPTION: This project seeks to develop and evaluate a real-time traffic and transit information system. Four tasks are underway: first, assess the market potential to increase bus, vanpool, and carpool use by providing traffic information, bus choices, and carpool options to travelers at home and work; second, evaluate available technologies and identify those most feasible and cost-effective; third, examine various ways of gathering and distributing transit and traffic information to include the identification of roles and costs for the agencies involved; and fourth, identify the project's administrative requirements and projected costs.

STATUS: The concept development phase has been completed. Houston Metro is negotiating an inter-agency agreement with the Texas Department of Highways and Public Transportation to fully define the roles of each party. Planning for the operational test is underway. Evaluation plans to measure the projects impacts have been designed.

ESTIMATED TOTAL PROJECT COST: $17,000,000

ANTICIPATED TOTAL FEDERAL SHARE: To be determined.

FEDERAL FUNDS THROUGH FY 93: $2,000,000 FHWA, $500,000 FTA

CONTACT: Denis Symes, FTA Headquarters, TTS-30, (202) 366-0232

IDAHO STORM WARNING SYSTEM

LOCATION: Interstate-84 in southeastern Idaho

PARTNERS: FHWA, Idaho Transportation Department (ITD), CH2M Hill, Handar Incorporated, Santa Fe Technologies, Surface Systems Incorporated (SSI)

START DATE: June 1993

END DATE: June 1996

DESCRIPTION: The purpose of the Idaho Storm Warning Operational Test is to investigate various sensor systems that could provide accurate and reliable visibility and weather data, and to use that data to provide general warnings, speed advisories, and possible road closure information to travelers on a section of I-84 in southeast Idaho that is highly prone to reduced visibility from blowing snow and dust. The primary goal of such a system is a major reduction in visibility related multi-vehicle accidents in rural areas. Information will be transmitted to the motorist via changeable message signs.

STATUS: Documents completed and accepted by FHWA by December 1993 include Revised Scope of Work, Evaluation Plan, and Individual Evaluation Test Plans for Phase I of the Operational Test Plan. ITD has prepared the Phase I test site with guard rail, fence, concrete foundations for sensor equipment towers, and power and telephone hook-ups. As of February 1994: two of three equipment suppliers (Handar and SSI) have installed a complete complement of their equipment at the site and are collecting weather and visibility data; ITD personnel have been trained on how to use and conduct routine maintenance on the equipment; and the computer system with related software to collect the sensor data, format for evaluation, and notify ITD personnel of specific events is being installed at the Cotterell Port of Entry.

ESTIMATED TOTAL PROJECT COST: $1,231,000

ANTICIPATED TOTAL FEDERAL SHARE: $804,500

FEDERAL FUNDS THROUGH FY 93: $529,500

IDAHO STORM WARNING SYSTEM (cont.)

CONTACT:

Ed Fischer, FHWA Region 10, HEO-10, (503) 326-2071
Greg Laragan, Idaho Transportation Department, (208) 334-8558

INCIDENT MANAGEMENT, MINNEAPOLIS, MINNESOTA

LOCATION:	Minneapolis, Minnesota
PARTNERS:	FHWA, Minnesota Department of Transportation
START DATE:	May 2, 1989
END DATE:	Complete
DESCRIPTION:	Two efforts are included in this project. The Metro Area Highway Advisory Radio (HAR) effort is providing information to motorists so they can assess current driving conditions and take alternative routes when major incidents occur. Broadcasts are being aired over the public radio station, KBEM-88.5 FM, operated by the Minneapolis Public School System. A Heavy Truck Incident Management effort will develop strategies on how to reduce and respond to heavy truck incidents.
STATUS:	The HAR project is operational. Two conferences have been held with the trucking industry to discuss area-wide diversion strategies and incident management issues.
ESTIMATED TOTAL PROJECT COST:	$534,000
ANTICIPATED TOTAL FEDERAL SHARE:	$
FEDERAL FUNDS THROUGH FY 93:	$184,000
CONTACT:	Jerry Emerson, FHWA Headquarters, HTV-31, (202) 366-2221

INCIDENT MANAGEMENT, SEATTLE, WASHINGTON

LOCATION: Seattle, Washington

PARTNERS: Federal Highway Administration, Washington State Department of Transportation Washington State Transportation Center

START DATE: May 19, 1989

END DATE: Completed

DESCRIPTION: This project, part of FAME (Freeway and Arterial Management Effort), is to develop a framework for establishing and implementing an incident management system. Various tasks are designed to analyze the effectiveness and costs of various incident management strategies, and determine the appropriate conditions for implementation.

STATUS: An incident management "framework" report has been completed and is available from the FHWA Office of Traffic Management and IVHS, HTV-31, Washington, DC 20590. Two related video tapes, "Incident Management Systems: Safety and Efficiency for All of Us," and "Accident Investigation with Total Stations in Washington State" have also been produced under an agreement with the FHWA Office of Technology Applications. Loan copies of both tapes are available from the FHWA R&D Publications and Reports Center, HRD-11, 6300 Georgetown Pike, McLean, VA 22101.

ESTIMATED TOTAL PROJECT COST: $150,000

ANTICIPATED TOTAL FEDERAL SHARE: $150,000

FEDERAL FUNDS THROUGH FY 93: $150,000

CONTACT: Jerry Emerson, FHWA Headquarters, HTV-31, (202) 366-2221

INTEGRATED CORRIDOR MANAGEMENT

LOCATION: New Jersey/Philadelphia

PARTNERS: New Jersey DOT, Pennsylvania DOT (anticipated), FHWA

START DATE: August 12, 1992

END DATE: On-going

DESCRIPTION: This project is being conducted by the New Jersey DOT in cooperation with the Pennsylvania DOT and the Delaware Valley Regional Planning Commission. Project components include a multi-jurisdictional clearinghouse for regional traffic information, similar to the TRANSCOM operation in Northern NJ/NY, and a study of the overall traffic and incident management needs in southern New Jersey and the Philadelphia metropolitan area.

STATUS: A cooperative agreement providing Federal funding for the project was signed by FHWA and the New Jersey DOT on August 12, 1992. New Jersey DOT has awarded a contract for the overall needs study included in the project, and is moving forward with activities such as incident management.

ESTIMATED TOTAL PROJECT COST: To be determined.

ANTICIPATED TOTAL FEDERAL SHARE: $6,000,000

FEDERAL FUNDS THROUGH FY 93: $6,000,000

CONTACT: Gary Corino, FHWA New Jersey, Division, (609) 989-2274

INTEGRATED RAMP METERING / ADAPTIVE SIGNAL CONTROL

LOCATION:	Irvine (Orange County), California
PARTNERS:	California Department of Transportation, City of Irvine, Farradyne Systems, University of California - Irvine, FHWA
START DATE:	1993
END DATE:	1996
DESCRIPTION:	This project will evaluate the operational effects of balancing traffic flow between I-5/I-405 and the parallel arterial streets. The project will also demonstrate the effectiveness of collaborative action on the part of transportation management agencies to optimize their strategies to improve traffic flow. The project will integrate an existing centrally-controlled freeway ramp meter system with an arterial signal system consisting of existing signal controllers, a new Advanced Traffic Controller, and a candidate adaptive control measure (OPAC).
STATUS:	Agreements and contracts among the project participants are nearing finalization.
ESTIMATED TOTAL PROJECT COST:	$3,337,000
ANTICIPATED TOTAL FEDERAL SHARE:	$2,617,000
FEDERAL FUNDS THROUGH FY 93:	$2,617,000
CONTACT:	Jeff Lindley, FHWA Region 9, HPD-09, (415) 744-2659 Robb Hughes, City of Irvine, (714) 724-7335

MINNESOTA GUIDESTAR PROGRAM

LOCATION: Statewide throughout Minnesota

PARTNERS: Federal, State and local agencies and private companies interested in the evaluation and deployment of IVHS user services and technologies.

START DATE: 1991

END DATE: On-going

DESCRIPTION: Minnesota Guidestar provides overall direction to the IVHS program by providing a focus for strategic planning, project identification, project initiation, project management, and evaluation. Minnesota Guidestar also provides coordination with other State and local agencies in Minnesota, such as the University of Minnesota, which have an interest and role in IVHS.

STATUS: In addition to the Genesis and Travlink IVHS Operational Field Tests listed separately, Minnesota Guidestar began concept definition and preliminary design for several other IVHS operational tests in FY '93.

Integrated Corridor Traffic Management (ICTM): This project will evaluate the ability of multiple agencies to manage freeways and arterials in a heavily traveled corridor as a "seamless" system using real-time adaptive control systems covering street signal systems and the freeway ramp metering system.

St. Paul Incident Management (SPIM): This project will provide for real-time adaptive management of traffic signals in downtown St. Paul when there is an incident on the freeway system.

Smart DARTS: This project will evaluate the ability of computer-aided dispatching to improve paratransit service for elderly and handicapped persons.

Portable Traffic Management System (PTMS): The goal of this project is to enhance private industry's ability to develop portable advanced traffic management systems which can be used to manage special event traffic on freeways and arterials.

Minneapolis Third Avenue Distributor (TAD): This project will provide for real-time adaptive signal control systems on the streets parallel to and accessing I-394 to better manage traffic related to major sporting events in Minneapolis.

MINNESOTA GUIDESTAR PROGRAM (cont.)

ESTIMATED TOTAL PROJECT COST: $2,413,790

ANTICIPATED TOTAL FEDERAL SHARE: $1,538,500

FEDERAL FUNDS THROUGH FY 93: $356,300

CONTACT:
ICTM: Linda Taylor, MnDOT, (612) 582-1461
SPIM: Ping Yi, MnDOT, (612) 297-7166
Smart DARTS: Donna Allan, MnDOT, (612) 296-7052
PTMS: Marthand Nookala, MnDOT, (612) 282-2469
Minneapolis TAD: Ping Yi, MnDOT, (612) 297-7166

MOBILE COMMUNICATIONS SYSTEM

LOCATION:	Orange County, California
PARTNERS:	California Department of Transportation (CalTrans), City of Anaheim, City of Irvine, Hughes Aircraft, CalPoly University, PATH, FHWA
START DATE:	1993
END DATE:	1996 (approximate)
DESCRIPTION:	This project will test and evaluate the use of a portable detection and surveillance system for highway construction, special events, and incident locations. Specially-equipped trailers will be placed at temporary traffic congestion locations throughout Orange County. Trailer-mounted video image detectors will use spread spectrum radio for transmission of real-time information to a CalTrans control center.
STATUS:	Agreements and contracts among the participants are nearing completion. Initial design and evaluation documents are being prepared.
ESTIMATED TOTAL PROJECT COST:	$4,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$3,000,000
FEDERAL FUNDS THROUGH FY 93:	$0
CONTACT:	Jeff Lindley, FHWA, Region 9, HPD-09, (415) 744-2659 Homar Noroozi, CalTrans District 12, (714) 756-7686

MULTI-JURISDICTIONAL LIVE AERIAL VIDEO SURVEILLANCE SYSTEM, I

LOCATION: Fairfax County, Virginia

PARTNERS: FHWA, Fairfax County Police, Virginia Department of Transportation (VDOT), Virginia State Police

START DATE: 1992

END DATE: 1994

DESCRIPTION: This is an IVHS operational test project to procure, install, and evaluate live video transmission from a gyro-stabilized camera mounted on helicopters for use in observing, evaluating, and properly managing major highway incidents and situations of a public safety nature. The live color video is transmitted to police and state highway traffic management centers, and to mobile command centers at incident sites. Communications technologies include microwave, Community Access TV (CATV), and state owned coaxial cable. It is expected that the use of real-time airborne video will serve as a valuable component of an Advanced Traffic Management System (ATMS), particularly in major incident management.

STATUS: The system is operational. A 6-month evaluation period will be completed in the spring of 1994.

ESTIMATED TOTAL PROJECT COST: $355,000

ANTICIPATED TOTAL FEDERAL SHARE: $355,000

FEDERAL FUNDS THROUGH FY 93: $355,000

CONTACT: Major Ronald Miner, Fairfax County Police, (703) 280-0550
Jimmy Chu, VDOT, (703) 521-5695
Bob Thomas, FHWA Virginia Division, (804) 771-2389

MULTI-JURISDICTIONAL LIVE AERIAL VIDEO SURVEILLANCE SYSTEM, II

LOCATION: Montgomery County, Maryland

PARTNERS: FHWA, Montgomery County Office of Traffic, Maryland State Highway Administration (MSHA)

START DATE: 1992

END DATE: 1994

DESCRIPTION: Similar in concept to the project in Fairfax County Virginia, this operational test project will evaluate live video transmission from fixed-wing aircraft to county and state traffic management centers. Maryland and Virginia will cooperate in this effort and will transmit video to traffic management centers in both states. Maryland, like Virginia will also test the feasibility of transmitting live video to mobile command centers.

STATUS: The system is operational. A 6-month evaluation period is underway.

ESTIMATED TOTAL PROJECT COST: $400,000

ANTICIPATED TOTAL FEDERAL SHARE: $295,000

FEDERAL FUNDS THROUGH FY 93: $295,000

CONTACT: Gene Donaldson, Montgomery County, (301) 217-2182
Mike Zezeski, MSHA, (410) 787-5860
Sylvia Grijalva, FHWA Maryland Division, (410) 962-4440

NORTH SEATTLE ADVANCED TRAFFIC MANAGEMENT SYSTEMS (ATMS) (INTEGRATED TRAFFIC CONTROL NETWORK)

LOCATION:	Seattle, Washington
PARTNERS:	Washington State Department of Transportation, Farradyne Systems, consortium of local cities & counties, FHWA
START DATE:	March 1994
END DATE:	March 1996
DESCRIPTION:	This project will develop and implement an area-wide, multi-jurisdictional advanced traffic management and traveler information system in the Seattle metropolitan area.
STATUS:	Initial design and evaluation documents are underway.
ESTIMATED TOTAL PROJECT COST:	$4,500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$3,500,000
FEDERAL FUNDS THROUGH FY 93:	$3,500,000
CONTACTS:	Ed Fischer, FHWA Region 10, HEO-10, (503) 326-2071 Morgan Balogh, Washington State DOT, (206) 543-6741

PATHFINDER

LOCATION:	Los Angeles, California
PARTNERS:	FHWA, California Department of Transportation (CalTrans), General Motors
START DATE:	1990
END DATE:	1992
DESCRIPTION:	Pathfinder is a cooperative effort by CalTrans, FHWA, and General Motors. It is the first U.S. test of the use of an in-vehicle navigation system to provided real-time traffic information to drivers. Pathfinder provided drivers of 25 specially equipped cars with up-to-date information about accidents, congestions, highway construction, and alternate routes in the Los Angeles Smart corridor. A control center managed the communication, detected traffic density and vehicle speeds (via detectors and by using the Pathfinder vehicles as probes) and transmitted congestion information to equipped vehicles. The information was then presented to the driver in the form of an electronic map on a display screen or digital voice.
STATUS:	The evaluation report is available from CalTrans.
ESTIMATED TOTAL PROJECT COST:	$2,500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$1,000,000
FEDERAL FUNDS THROUGH FY 93:	$1,000,000
CONTACT:	Frank Mammano, FHWA R&D, HSR-10, (703) 285-2405 Steven Leung, California Department of Transportation District 7

SAN ANTONIO ADVANCED TRAFFIC MANAGEMENT SYSTEM TEST (TEXAS)

LOCATION: San Antonio, Texas

PARTNERS: Texas Department of Transportation (TxDOT), AlliedSignal Technical Services Corporation, Southwest Research Institute (SwRI), Texas Transportation Institute (TTI), FHWA

START DATE: November 1993

END DATE: End of 1995

DESCRIPTION: The TxDOT is installing the first phase of an advanced traffic management system (ATMS) in San Antonio at an estimated cost of $33 million. Upon completion of this first project, the three story control center and twenty-five (25) miles of the one hundred ninety (190) mile proposed ATMS will be operational. This ATMS will provide:

* Complete digital communication network (voice, data, and video);
* Communication standard "SONET";
* Fully redundant fiber optic network;
* Fault tolerant computer system;
* Software developed to "POSIX" standards;
* Fully developed Central Control facility with a test-bed development computer;
* Field equipment consisting of changeable message signs, lane control signals, loop detectors, and surveillance cameras;
* Incident detection goal of 2 minutes; and,
* System response goal of under 1 minute after detection.

This Operational Test will document the San Antonio ATMS system design rationale and goals, evaluate the system's success in meeting the design goals, and evaluate the digital communication network for cost effectiveness and benefits versus "traditional" transportation data communication systems. An additional element of this Operational Test is the on-line evaluation and comparison of several incident detection algorithms.

SAN ANTONIO ADVANCED TRAFFIC MANAGEMENT SYSTEM TEST (TEXAS) (cont.)

STATUS: The TxDOT has a signed agreement with AlliedSignal to construct a system laboratory. SwRI will perform the system evaluation, and the TTI will conduct the incident detection algorithm comparisons. AlliedSignal has begun construction of the evaluation laboratory, and SwRI is expected to begin documenting design goals, perform a publication search, and visit selected traffic control center sites in March, 1994. TTI will begin incident detection algorithm evaluation in August, 1994. The ATMS design summary document should be completed by November, 1994.

ESTIMATED TOTAL PROJECT COST: $1,298,466

ANTICIPATED TOTAL FEDERAL SHARE: $899,654

FEDERAL FUNDS THROUGH FY 93: $899,654

CONTACT: Mark Olson, FHWA Division Office, Austin, Texas, (512) 482-5966
Pat Irwin, TxDOT, (210) 615-5825

SATELLITE COMMUNICATIONS FEASIBILITY

LOCATION: I-95 in Philadelphia, Pennsylvania

PARTNERS: FHWA, Pennsylvania Department of Transportation (PennDOT)

START DATE: 1991

END DATE: 1995

DESCRIPTION: This project will evaluate the use of VSAT (very small aperture terminal) satellite as the communications medium for four stationary closed-circuit television (CCTV) cameras and a mobile CCTV camera and communication platform. Specific objectives of the project are to: 1) develop and evaluate the feasibility of remote switching of multiple cameras through a single satellite channel, 2) develop and evaluate the feasibility of a mobile CCTV camera and communication platform, 3) determine the impact of weather conditions and other factors that degrade the VSAT signal integrity, 4) determine the limitation of VSAT for video surveillance by examining image clarity, pan-tilt-zoom controls and other factors associated with day-to-day CCTV freeway surveillance, 5) test the security of VSAT remote equipment with respect to vandalism and theft, and 6) compare VSAT video quality with other communications medium including leased T-1 service and direct fiber optic cable.

STATUS: Final project plans and specifications have been submitted with construction scheduled for summer 1994 and initial operational tests in early 1995.

ESTIMATED TOTAL PROJECT COST: $2,200,000

ANTICIPATED TOTAL FEDERAL SHARE: $2,200,000

FEDERAL FUNDS THROUGH FY 93: $2,200,000

CONTACT: Carmine Fiscina, FHWA, Harrisburg, Pa., (717) 782-4423
Doug May, Pennsylvania DOT, (215) 768-3053

SCOOT ADAPTIVE TRAFFIC CONTROL SYSTEM

LOCATION: Anaheim, California

PARTNERS: City of Anaheim, California Department of Transportation (CalTrans), Odetics

START DATE: September 1993

END DATE: January 1995

DESCRIPTION: This operational test will implement SCOOT in an area of the City of Anaheim's traffic control system so that it can be evaluated for its effectiveness as an adaptive signal timing control package. SCOOT automates the data collection process and then automatically optimizes traffic signal timing based on real-time traffic conditions. The test will also include the installation and evaluation of Video Traffic Detection System (VTDS) cameras in conjunction with the SCOOT system. The VTDS cameras will potentially provide a way to adjust the traffic count locations so that optimal data collection sites for the SCOOT system can be identified.

STATUS: Work is underway on the evaluation plan for this project. Work on the project itself will not start until the agreement between the City of Anaheim and California Department of Transportation is finalized. It is estimated that this agreement will be executed by April 1994.

ESTIMATED TOTAL PROJECT COST: $2,271,147

ANTICIPATED TOTAL FEDERAL SHARE: $1,156,647

FEDERAL FUNDS THROUGH FY 93: $986,647

CONTACT: Jackie Landsman, FHWA Region 9, HPD-09, (415) 744-3103
Frank Cechini, FHWA California Division, HTA-CA, (916) 551-1079
Jim Paral, City of Anaheim, (714) 254-5183

SMART CALL BOX

LOCATION: San Diego, California

PARTNERS: San Diego Service Authority for Freeway Emergencies (SDSAFE), California Department of Transportation (CalTrans), California Highway Patrol (CHP)

START DATE: September 1993

END DATE: October 1995

DESCRIPTION: This operational test takes advantage of the extensive call box system installed on California freeways and will attempt to increase their functionality by adding an interface to traffic management devices. The project will include testing the feasibility of using the Smart Call Boxes to collect traffic census data; obtain traffic counts, flows and speeds for incident detection; report information from roadside weather information systems; control changeable message signs; and control roadside closed-circuit television cameras.

STATUS: There have been delays in processing the Local/State agreements, however Smart Call Box site investigations are underway and an inventory of existing traffic management devices which could interface with the Smart Call Boxes is being undertaken.

ESTIMATED TOTAL PROJECT COST: $2,260,200

ANTICIPATED TOTAL FEDERAL SHARE: $915,000

FEDERAL FUNDS THROUGH FY 93: $915,000

CONTACT: Jackie Landsman, FHWA Region 9, HPD-09, (415) 744-3103
Frank Cechini, FHWA California Division, HTA-CA, (916) 551-1079
Mike Perkins, SDSAFE, (619) 694-2190
David Dutcher, CalTrans, (619) 688-4274

SPREAD SPECTRUM RADIO TRAFFIC INTERCONNECT

LOCATION:	Los Angeles, California
PARTNERS:	City of Los Angeles, Hughes Aircraft, JHK, California Department of Transportation (CalTrans)
START DATE:	Summer 1994
END DATE:	Summer 1996
DESCRIPTION:	This operational test will evaluate the use of spread spectrum radio as a traffic signal communications devices within the Los Angeles ATSAC signal system. The radios will be tested in a network of signals to determine their ability to reliably reroute communications links, their ability to work in a variety of geographies, their ability to provide for large-scale once-per-second communications, and to determine the cost-effectiveness of using this technology.
STATUS:	Estimated start date is the summer of 1994.
ESTIMATED TOTAL PROJECT COST:	$3,500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$2,600,000
FEDERAL FUNDS THROUGH FY 93:	$0
CONTACT:	Jackie Landsman, FHWA Region 9, HPD-09, (415) 744-3103 Frank Cechini, FHWA California Division, HTA-CA, (916) 551-1079 Anson Nordby, LADOT, (213) 485-4271

TRANSCOM CONGESTION MANAGEMENT PROGRAM

LOCATION: Metro New York City area (NJ/NY/CT)

PARTNERS: FHWA, New York Department of Transportation, New Jersey Department of Transportation (NJDOT), TRANSCOM and other member agencies.

START DATE: Federal IVHS program funding support was initiated in FY 1990.

END DATE: On-going

DESCRIPTION: TRANSCOM (Transportation Operations Coordinating Committee) is a consortium of 15 transportation and public safety agencies in the New York, New Jersey and Connecticut area whose goal is to improve inter-agency response to traffic incidents. A number of project initiatives have been undertaken to support this goal, and to advance the use of IVHS-related technologies in the metropolitan area. These include:

- Regionwide initiatives for coordinated deployment and operation of variable message signs, highway advisory radio, and enhanced traffic monitoring including closed-circuit television.
- Development of an "IVHS Regional Implementation Strategy;" a program for coordinated implementation of IVHS throughout this complex, multi-jurisdictional metropolitan area.
- An enhanced traffic advisory/diversion system at the intersection of the New Jersey Turnpike and Garden State Parkway; which will focus on alternate routing for New Jersey Transit buses.
- Expansion of traffic monitoring along the I-287 Tappan Zee Bridge corridor.
- The "TRANSMIT" (TRANSCOM's System for Monitoring Incidents and Traffic) Operational Test project will managing vehicles with transponders on a highway system equipped with readers/antennas, to collect travel times, speeds and with dynamic software, detect incidents. This project is described in more detail elsewhere in this document.

STATUS: The TRANSCOM congestion management program is on-going.

TRANSCOM CONGESTION MANAGEMENT PROGRAM (cont.)

ESTIMATED TOTAL PROJECT COST:	To be determined.
ANTICIPATED TOTAL FEDERAL SHARE:	To be determined.
FEDERAL FUNDS THROUGH FY 93:	$11,400,000
CONTACT:	Jonathan McDade, FHWA Region 1 (Albany, NY), (518) 472-4253

TRANSMIT

LOCATION: Rockland County, NJ/Bergen County, New Jersey

PARTNERS: FHWA, New Jersey Department of Transportation (NJDOT), New York State Thruway Authority, New Jersey Highway Authority, TRANSCOM

START DATE: January 1, 1991

END DATE: December 1, 1994

DESCRIPTION: The "TRANSMIT" (TRANSCOM's System for Managing Incidents and Traffic) Operational Test will evaluate the use of automatic vehicles identification (AVI) technology as an incident detection tool. A consultant team (headed by Farradyne, Inc.) has finalized design for a system of AVI "tag" readers which allow vehicles equipped with transponders to serve as traffic probes. Tag-equipped probe vehicles will be assigned a random identification number as they enter a system populated with AVI readers spaced approximately 2 km apart. Software analysis will be used to help identify potential incidents by comparing actual to predicted travel times between readers, in addition to determining real-time traffic information such as speed and travel time.

STATUS: Project was authorized for construction in February 1994, and the test system is expected to be operational on a 25km section of the New York State Thruway and the Garden State Parkways in 1994.

ESTIMATED TOTAL PROJECT COST: $2,550,000

ANTICIPATED TOTAL FEDERAL SHARE: $2,050,000

FEDERAL FUNDS THROUGH FY 93: $2,050,000

CONTACT: Jonathan McDade, FHWA Region 1, HPP-01, (518) 472-4253
Gary Corino, FHWA New Jersey, DET-NJ, (609) 989-2274
Tom Batz, TRANSCOM, (201) 963-4033

TRAVEL-AID

LOCATION: Snoqualmie Pass, Washington State

PARTNERS: NHTSA, FHWA, Washington State Department of Transportation (WSDOT), Farradyne Systems Inc., Engineering Research Associates (ERA), General Logistics, Surface Systems Incorporated (SSI), University of Washington - Washington State Transportation Center (TRAC), Traffic Master

START DATE: November 1992

END DATE: May 1996

DESCRIPTION: This project will use variable speed limit signs, variable message signs, and in-vehicle communications and signing equipment to improve safety along a 40-mile stretch of I-90 across Snoqualmie Pass, a rural area prone to snow, ice and poor visibility. Electronic sensing and equipment will be installed to monitor traffic, speeds and road and weather conditions. This information will help determine the safest speed. Another system, developed by Farradyne, will use eight variable message signs to broadcast warnings about road conditions, accidents, or slow-moving equipment. The project proposes to use a relatively simple, low cost in-vehicle device with the primary function of displaying a text message to the motorist. The message would be accompanied by an alert signal to inform the motorist that a message is available. Up to 200 vehicles will be equipped with devices to deliver information similar to that displayed from the roadway variable message sign (VMS) system.

STATUS: The PS&E is nearing completion for construction of the variable message and variable speed limit signs along I-90. Each of the signs will be an identical full matrix VMS capable of displaying the variable speed limit and a 30-45 character message. The in-vehicle units selected for the project are ERA's Traffic Master. Plans and specifications for the communications infrastructure and sign structures are scheduled for completion in spring 1994. Construction will begin in summer 1994. Demonstration and testing of the in-vehicle communications will begin in the winter of 1994-95. A final draft of the evaluation plan was submitted in November, 1993, and outlines several project objectives, including assessing the impact of the system on driver behavior and the driving task. Variable message signs and variable speed limits will be in full operation by the winter of 1995-96.

TRAVEL-AID (cont.)

ESTIMATED TOTAL PROJECT COST:	$4,986,291
ANTICIPATED TOTAL FEDERAL SHARE:	$1,828,525
FEDERAL FUNDS THROUGH FY 93:	$1,579,525
CONTACT:	Stephen Clinger, FHWA Headquarters, HTV-20, (202) 366-2160

TRAVINFO

LOCATION:	San Francisco Bay area, California
PARTNERS:	California Department of Transportation (CALTRANS), Bay Area Ad Hoc IVHS Committee, FHWA
START DATE:	1993
END DATE:	1996 (approximate)
DESCRIPTION:	The TravInfo project will implement a comprehensive, region-wide traveler information system, capable of supplying a broad array of devices and users with transportation information both before and during trips. TravInfo includes the development and operation of a multi-modal transportation information center that will integrate transportation information from a wide variety of sources and make the information available to the general public, public agencies and commercial (value-added) vendors. TravInfo will pursue an "open-access" architecture for all aspects of the system to provide for future growth and facilitate the transfer of technology.
STATUS:	Architecture design contract has been awarded. The evaluation plan has been finalized. Management board is meeting regularly to discuss/resolve issues.
ESTIMATED TOTAL PROJECT COST:	$4,211,500
ANTICIPATED TOTAL FEDERAL SHARE:	$2,500,000
FEDERAL FUNDS THROUGH FY 93:	$2,500,000
CONTACT:	Jeff Lindley, FHWA Region 9, HPD-09, (415) 744-2659 Melanie Crotty, Metropolitan Trans. Commission, (510) 464-7708

TRAVLINK

LOCATION:	Minneapolis/St. Paul, Minnesota
PARTNERS:	Minnesota Department of Transportation, Regional Transit Board, US West, 3M/Renix, City of Minneapolis, University of Minnesota, FHWA
START DATE:	1993
END DATE:	1996 (approximate)
DESCRIPTION:	TravLink is a 3-year project that will implement an Advanced Traveler Information System (Advanced Traveler Information Systems) and Advanced Public Transportation System (APTS) along the I-394 corridor extending from downtown Minneapolis, approximately 12 miles to the west. TravLink will provide real-time transit schedule and traffic information through a combination of kiosks and terminals at work, home, shopping centers, and transit stations.
STATUS:	A consultant design team is in place and an evaluation contractor has been selected. Initial evaluation and design documents have been prepared and are nearing completion.
ESTIMATED TOTAL PROJECT COST:	$5,762,000
ANTICIPATED TOTAL FEDERAL SHARE:	$3,571,000
FEDERAL FUNDS THROUGH FY 93:	$3,571,000
CONTACT:	Martin J. Monahan, FHWA Region 5, HES-05, (708) 206-3218 Marthand Nookala, MnDOT Program Manager, (612) 282-2469

TRAVTEK

LOCATION:	Orlando, Florida
PARTNERS:	City of Orlando, Florida DOT, FHWA, General Motors/Hughes, American Automobile Association
START DATE:	1990
END DATE:	1994
DESCRIPTION:	TravTek (Travel Technology) provided traffic congestion information, motorist services ("yellow pages") information, tourist information and route guidance to operators of 100 test vehicles, rented through AVIS, that were equipped with in-vehicle TravTek devices. Route guidance reflected real time traffic conditions in the TravTek traffic network. A Traffic Management Center obtained traffic congestion information from various sources and provided this integrated information, via digital data radio broadcasts, to the test vehicles and the data sources.
STATUS:	TravTek rental operations began in March 1992. The operations phase ended in March 1993. The data collection for project evaluation is completed. The final evaluation reports are scheduled to be available in mid-summer 1994. In addition to the TravTek partners, the National Highway Traffic Safety Administration (NHTSA) is participating in the TravTek evaluation.
ESTIMATED TOTAL PROJECT COST:	$12,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$3,000,000
FEDERAL FUNDS THROUGH FY 93:	$2,679,163
CONTACT:	Robert Rupert, FHWA Headquarters, HTV-10, (202) 366-2194

Travel and Traffic Management

(IVHS Deployment)

INTEGRATED TRAFFIC MANAGEMENT SYSTEM

LOCATION: Anaheim, California

PARTNERS: City of Anaheim, Orange County Transportation Authority, California Department of Transportation, FHWA, FTA, U.S. Department of Energy

START DATE: 1987

END DATE: Ongoing

DESCRIPTION: The Anaheim Integrated Traffic Management System features an integrated, inter-jurisdictional approach to managing traffic associated primarily with special events in the City of Anaheim and surrounding parts of Orange County. The surface street system features computerized traffic signal control, highway advisory radio, closed circuit television, and changeable message signs. The system is linked electronically with the California Department of Transportation's Traffic Management Center, which manages freeway traffic in Orange County. Several new traveler information elements have been recently implemented, such as traffic advisory telephone and cable television distribution of traffic information.

STATUS: The project is fully operational and is continually being expanded and enhanced. Three reports have been recently completed, one covering the system implementation process, one covering the multi-jurisdiction coordination of traffic signals along Katella Avenue, and one covering the role of IVHS in transit operations in Orange County. A fourth report, covering the evaluation of the overall effectiveness of the system is due to be submitted in June 1994.

ESTIMATED TOTAL PROJECT COST: $13,134,609

ANTICIPATED TOTAL FEDERAL SHARE:
$ 2,457,044 (DOT)
$ 1,300,000 (DOE)

FEDERAL FUNDS THROUGH FY 93:
$ 2,457,044 (DOT)
$ 1,300,000 (DOE)

CONTACTS:
Jeff Lindley, FHWA Region 9, (415) 744-2659
Frank Cechini, FHWA California Division, (916) 551-1079
Jim Paral, City of Anaheim, (714) 254-5183

SMART CORRIDOR

LOCATION: Los Angeles, California

PARTNERS: Los Angeles County Transportation Commission (LACTC), City of Los Angeles, FHWA

START DATE: July 16, 1991

END DATE: July 16, 1993

DESCRIPTION: The SMART Corridor is a joint operational project located along 12.3 miles of the Santa Monica freeway corridor in Los Angeles. The objectives of the Smart Corridor are to provide congestion relief, reduce accidents, reduce fuel consumption, and improve air quality. This will be accomplished using advanced technologies to advise travelers of current conditions and alternate routes (using communication systems such as Highway Advisory Radio (HAR), Changeable Message Signs (CMS), kiosks, and teletext), improving emergency response, and providing coordinated inter-agency traffic management. The freeway systems will be operated by the State and the arterial streets by the City, with coordination provided via voice communications and electronic data sharing.

STATUS: This $48-million project is under development, and is expected to be fully operational by the summer of 1994. The project will then be evaluated for effectiveness and applicability to other corridors.

ESTIMATED TOTAL PROJECT COST: $47,000,000

ANTICIPATED TOTAL FEDERAL SHARE: $1,100,000

FEDERAL FUNDS THROUGH FY 93: $1,100,000

CONTACT: Jeff Lindley, FHWA Region 9, HPD-09, (415) 744-2659

PUBLIC TRANSPORTATION MANAGEMENT

PUBLIC TRANSPORTATION MANAGEMENT

- En Route Transit Information

  Provides information to travelers using public transportation after they begin their trips.

  This service provides information to assist the traveler once public transportation travel begins. Real-time, accurate transit service information on board the vehicle helps travelers make effective transfer decisions and itinerary modifications as needed while a trip is underway.

- Public Transportation Management

  Automates operations, planning, and management functions of public transit systems.

  This service provides computer analysis of real-time vehicle and facility status to improve transit operations and maintenance. The analysis identifies deviations from schedule and provides potential solutions to dispatchers and drivers. Integrating this capability with traffic control services can help maintain transportation schedules and assure transfer connections in intermodal transportation. Information regarding passenger loading, bus running times, and mileage accumulated will help improve service and facilitate administrative reporting. Automatically recording and verifying performed tasks will also enhance transit personnel management.

- Personalized Public Transit

  Flexibly routed transit vehicles offer more convenient service to customers.

  Small publicly or privately operated vehicles provide on-demand routing to pick up passengers who have requested service and deliver them to their destinations. Route deviation schemes, where vehicles would leave a fixed route for a short distance to pick up or discharge passengers, is another way of improving service. Vehicles can include small buses, taxicabs, or other small, shared ride vehicles. This service can provide almost door-to-door service, expanding transit coverage to lesser populated locations and neighborhoods. This can potentially provide transportation at lower cost and with greater convenience that conventional fixed route transit.

- Public Travel Security

Creates a secure environment for public transportation patrons and operators.

This service provides systems that monitor the environment in transit stations, parking lots, bus stops, and on-board transit vehicles, and generate alarms, either automatically or manually, when necessary. This improves security for both transit riders and operators. Transportation agencies and authorities can integrate this user service with other anti-crime activities.

Public Transportation Management

(Research and Development)

PORTLAND SMART BUS

DESCRIPTION: This project reviewed the German-made Flexible Operation Command and Control System (FOCCS) that integrates fixed-route transit, dial-a-ride minibus, and contract taxi services. The information integration provides arrival and destination data to travelers and operators. The review included the following: first, evaluating the technical and economic feasibility of adding audiotex/videotex components and carpool matching capabilities to the systems; second, evaluating the technical requirements of adding a FOCCS components to Tri-Met's central control plans; third, evaluating the cost-effectiveness of FOCCS in Portland's rapidly growing suburbs; and fourth, designing an operational test for those components found suitable. Hardware and software requirements are included in the analysis.

START DATE: September 1990

END DATE: September 1993

STATUS: The final report is being evaluated by the Portland Transit Authority for implementation.

ESTIMATED TOTAL PROJECT COST: $90,000

ANTICIPATED TOTAL FEDERAL SHARE: $54,000

FEDERAL FUNDS THROUGH FY 93: $54,000

CONTACT: Ron Boenau, FTA Headquarters, TTS-32, (202) 366-0195

TRAFFIC MANAGEMENT INFORMATION AND FLEET OPERATION COORDINATION

DESCRIPTION: This study further develops a concept plan and project design for a real-time information service to be provided to travelers in a variety of ways including bus stops, transfer centers, and on transit vehicles. The information sources to be used will include the City of Anaheim, the Orange County Transit District and the California Department of Transportation (CalTrans). A central Traveler Information System will be used. The City of Anaheim has one of California's most advanced traffic management systems and has been selected by CalTrans as a testbed.

START DATE: December 1991

END DATE: December 1992

STATUS: The concept planning work has been completed.

ESTIMATED TOTAL PROJECT COST: $100,000

ANTICIPATED TOTAL FEDERAL SHARE: $100,000

FEDERAL FUNDS THROUGH FY 93: $100,000

CONTRACTOR: California Department of Transportation (CalTrans)

CONTACT: Denis Symes, FTA Headquarters, TTS-30, (202) 366-0232

TRANSIT NETWORK ROUTE DECISION AID

DESCRIPTION: This project to develop specifications for designing, implementing, and evaluating a computerized information system to aid a telephone operator in rapidly identifying useful itineraries for passengers in a mass transit system. Specifically, it developed a procedure for constructing a decision aid; investigate algorithms and discuss how to extend or specialize them; and develop a plan for decision aid evaluation.

START DATE: September 1991

END DATE: October 1993

STATUS: Work is underway in the investigation and analysis of algorithms. Various techniques to extend and specialize them are being developed.

After decision-aid algorithms are evaluated and improved, a possible demonstration test site is the Ann Arbor Transit Authority, which has a 75-vehicle fleet. A further project could be a cost-benefit analysis of various decision-aid systems for a range of transit providers, from small paratransit operators to large metropolitan fleets. Such a project could identify the hardware and software for optimal systems, the associated capital and operating costs, and the expected returns.

ESTIMATED TOTAL PROJECT COST: $70,000

ANTICIPATED TOTAL FEDERAL SHARE: $70,000

FEDERAL FUNDS THROUGH FY 93: $59,553

CONTRACTOR: University of Michigan, Department of Industrial Operations and Engineering

CONTACT: Sean Ricketson, FTA Headquarters, TTS-30, (202) 366-6678
Chip White, University of Michigan, (313) 763-1332

TRANSIT TECHNOLOGY RESEARCH

DESCRIPTION: This activity will evaluate various new technologies for their potential benefit to transit. Human factors and engineering factors will be investigated and designed into IVHS systems being developed to maximize benefits to implementation. Spectrum allocation, advanced vehicle location, and architecture studies will be conducted for subsequent operational test implementation. This project will also study the transit requirements for an orderly transition into new IVHS technologies which are required to allow the maximum benefit.

START DATE: N/A

END DATE: N/A

STATUS: Transit application requirements have been determined for vehicle location systems using GPS and advanced fare collection using multi-use smart cards. Appropriate operational test designs are being developed at specific sites.

Opportunities for creating transit applications from the new technologies coming available commercially and out of the defense industry are expected to continue throughout the 90's.

ESTIMATED TOTAL PROJECT COST: To be determined.

ANTICIPATED TOTAL FEDERAL SHARE: To be determined.

FEDERAL FUNDS THROUGH FY 93: To be determined.

CONTACT: Denis Symes, FTA Headquarters, (202) 366-0232
Robert Casey, Volpe National Transportation Systems Center (VNTSC) DOT, (617) 494-2213

Public Transportation Management

(Operational Tests)

ALTERNATE BUS ROUTING

LOCATION:	Garden State Parkway, New Jersey
PARTNERS:	FHWA, New Jersey Department of Transportation (NJDOT), New Jersey Highway Authority, TRANSCOM, Hughes Transportation Management Systems
START DATE:	1993
END DATE:	Ongoing
DESCRIPTION:	The Alternate Bus Route Project will be a pilot evaluation of next generation Vehicle-to-Roadside Communications (VRC). The first phase will utilize a VRC transponder as both an advanced read/write traffic probe and to advise a bus driver of traffic conditions between the Raritan Toll Plaza and Interchange 129 via visual and audio messaging.
STATUS:	Phase I is currently under development under an IVHS partnership agreement with Hughes.
ESTIMATED TOTAL PROJECT COST:	$625,000
ANTICIPATED TOTAL FEDERAL SHARE:	$500,000
FEDERAL FUNDS THROUGH FY 93:	$500,000
CONTACT:	Jonathan McDade, FHWA Region 1, HPP-01, (518) 472-4253 Gary Corino, FHWA New Jersey Division, (609) 989-2274 Tom Batz, Trans. Operations Coordinating Committee, (201) 963-4033

ANN ARBOR SMART BUS

LOCATION: Ann Arbor Transit Authority (AATA), Ann Arbor, Michigan

PARTNERS: Federal Transit Administration (FTA), City of Ann Arbor, University of Michigan

START DATE: July 1991

END DATE: July 1994

DESCRIPTION: This project will support the Ann Arbor Transportation Authority's (AATA) conduct of an operational test of the Smart Bus concept. Included are an on-board bus communication and navigation system, a central control system, and a "Smart Card" fare collection system. The on-board system monitors actual performance in regard to route, location, speed and status of mechanical systems. It will allow control of on-board electronics, such as the fare collection system, destination sign and enunciator. The on-board system will also enable buses to interact with traffic signal preemption devices and to communicate with the central control system. The central control system will then integrate the data from the bus fleet for coordinated supervision, and will also provide real-time transit information to the public. The "Smart Card" fare system will provide a dual farecard/parking pass to encourage auto drivers to ride transit by providing them an easy cost-saving method for fare payment.

STATUS: AATA has selected GSI to develop the bus management and the Smart Card fare and parking system, and the agreement is currently being finalized.

The operational test will be evaluated through the Volpe National Transportation Systems Center to provide a critical analysis of systems and technologies. The evaluation will identify problems in the implementation and use of Smart Cards, and will make recommendations for future research and testing.

ANN ARBOR SMART BUS (cont.)

ESTIMATED TOTAL PROJECT COST:	$2,442,500
ANTICIPATED TOTAL FEDERAL SHARE:	$1,980,000
FEDERAL FUNDS THROUGH FY 93:	$209,714
CONTACT:	Sean Ricketson, FTA Headquarters, TTS-30, (202) 366-6678

CTA (CHICAGO) SMART BUS INTERMODAL

LOCATION: Chicago, Illinois

PARTNERS: FTA, City of Chicago Department of Public Works and Department of Streets and Sanitation

START DATE: July 1991

END DATE: September 1994

DESCRIPTION: This cooperative agreement supports data collection and evaluation of an operational test of a Bus Service Management System (BSMS) by the Chicago Transit Authority (CTA). The CTA is in the process of creating a BSMS which includes procuring an Automatic Vehicle Location (AVL) system, a computer-assisted dispatch and control system, real-time passenger information signs, and a traffic signal preemption system. The initial demonstration phase is being funded locally by the Regional Transportation Authority (RTA). In addition to supporting data collection and evaluation, this cooperative agreement is to document the implementation of the BSMS, and to analyze the BSMS human factors element to assess the effects of introducing video terminals and information systems into the transit dispatching environment.

STATUS: An extensive review of hardware and software vendors has been conducted along with a review of AVL and traffic signal preemption specifications. A Request for Proposal was released and then revised in the summer of 1993. Evaluation of proposals is underway with selection likely in the summer of 1994.
Future Developments: After system selection and procurement, the operational test and subsequent evaluations will take place. The results of the evaluations will be made available through conferences, seminars, and written reports.

CTA (CHICAGO) SMART BUS INTERMODAL (cont.)

ESTIMATED TOTAL PROJECT COST:	$3,640,000
ANTICIPATED TOTAL FEDERAL SHARE:	$490,000
FEDERAL FUNDS THROUGH FY 93:	$101,264
CONTACT:	Sean Ricketson, FTA Headquarters, TTS-30, (202) 366-6678 Jim Blanchard, Chicago Transit Authority, (312) 664-7200 ext. 4566

DALLAS SMART BUS EVALUATION

DESCRIPTION: Dallas Area Rapid Transit (DART) has installed an Integrated Radio System that includes automatic vehicle location. When completely installed in mid-1994, 8323 transit buses, 200 mobility impaired vans and 142 supervisory and support vehicles will be equipped. The Global Positioning System (GPS), a satellite navigation system developed by the Department of Defense, will generate vehicle location information.

The Federal Transit Administration is sponsoring an evaluation of this system to determine its effectiveness in controlling bus schedules and position accuracy determinations. The evaluation is part of a national evaluation plan for all FTA sponsored demonstration activities. All projects will be evaluated on an equal basis through a common evaluation format. This approach will permit other areas to judge the effectiveness of a new technology or operational approach on a comparative basis to determine which technologies have the greatest potential in their own context.

START DATE: To be determined.

END DATE: To be determined.

STATUS: The evaluation plan has been prepared by the Volpe National Transportation Systems Center and will be used as the foundation for this evaluation. The Integrated Radio System is presently being installed; approximately 150 vehicles are presently involved in system polling tests. Plans call for the system to be accepted by June 30, 1994.

ESTIMATED TOTAL PROJECT COST: $10,000,000

ANTICIPATED TOTAL FEDERAL SHARE: $8,000,000

FEDERAL FUNDS THROUGH FY 93: $40,000

CONTACT: Denis Symes, FTA Headquarters, TTS-30, (202) 366-0232
Paul Ledwitz, Dir. of Communications, Dallas DOT, (214) 749-2837

DELAWARE COUNTY RIDETRACKING

LOCATION: Delaware County Pennsylvania

PARTNERS: FTA, EG&G Dynatrend

START DATE: September 1992

END DATE: December 1994

DESCRIPTION: This project will develop and evaluate an automated identification and billing system (AIBS) for paratransit service. The AIBS will automate existing processes using advanced technology for the identification of passengers, the accounting and billing data collected on each passenger trip, the reporting required for coordination with various transportation suppliers and internal performance monitoring. Elimination of manual processes, including eligibility verification and reconciliation of trip information for billing purposes, will result in system efficiency and cost saving.

STATUS: Proposals are under review and a contractor is expected to be selected in February 1994.
Based on the results of the AIBS system, applications of similar systems for other paratransit services will be examined.

ESTIMATED TOTAL PROJECT COST: $518,000

ANTICIPATED TOTAL FEDERAL SHARE: $200,000

FEDERAL FUNDS THROUGH FY 93: $0

CONTACT: Sean Ricketson, FTA Headquarters, TTS-30, (202) 366-6678
Judy McGrane, Community Transit, (215) 532-2900

DENVER, COLORADO RAPID TRANSIT DISTRICT (RTD) PASSENGER INFORMATION DISPLAY SYSTEM

DESCRIPTION: This project will utilize the data gathered from the Automatic Vehicle Locator (AVL) system, currently being installed on all RTD buses, to provide information to video monitors at selected locations throughout the District and at selected Ecopass companies regarding estimated bus departures for waiting bus passengers.

START DATE: September 1993

END DATE: September 1995

STATUS: The memorandum of understanding between RTD-Colorado, DOT-Westinghouse-FHWA is being developed. The project was approved with limited funding as compared to the original proposal, therefore considerable negotiations have been necessary to clearly redefine the project.

ESTIMATED TOTAL PROJECT COST: $2,000,000

ANTICIPATED TOTAL FEDERAL SHARE: $1,000,000

FEDERAL FUNDS THROUGH FY 93: $1,000,000

CONTACT: C. P. Damon, FHWA Region 8, HPD-08, (303) 969-6712
Dave Shelley, RTD, (303) 299-2408

DETROIT TRANSPORTATION CENTER TRANSIT INFORMATION

LOCATION: Detroit, Michigan

PARTNERS: FTA, FHWA, Detroit, Michigan Department of Transportation (MDOT)

START DATE: June 1992

END DATE: March 1994

DESCRIPTION: This is a joint FTA/FHWA project to provide real-time traffic condition information to dispatch centers of public transit agencies in the Detroit area. MDOT's Detroit Freeway Operations Center collects traffic information on 32 miles of freeway through a buried inductive loop system. The information is then graphically displayed on computer monitors by color coding individual freeway segment (link) speeds. This project will demonstrate the ability to provide the information to public and private transit operators inexpensively, and will then monitor performance changes and evaluate the results.

STATUS: The project began in June 1992 with initial orders for computer hardware. Delivery and set-up is expected in Spring 1994.
Future developments: Depending upon the success of the project, traffic information may be more widely available, and other traffic management centers may to providing similar services for their local transit agencies. Additionally, there may be potential for real-time traffic data at home, work, bus stops, transfer stations, and in transit vehicles.

ESTIMATED TOTAL PROJECT COST: $100,000

ANTICIPATED TOTAL FEDERAL SHARE: $50,000

FEDERAL FUNDS THROUGH FY 93: $44,707

CONTACT: Janet D'Ignazio, Michigan DOT, (517) 373-2834
Sean Ricketson, FTA Headquarters, (202) 366-6678

METROPOLITAN TRANSPORTATION CENTER, DETROIT: ADVANCE PUBLIC TRANSPORTATION SYSTEMS (APTS) PROJECT INFORMATION

LOCATION:	Detroit, Michigan
PARTNERS:	FTA, FHWA, Detroit, Michigan Department of Transportation (MDOT)
START DATE:	June 1992
END DATE:	March 1995
DESCRIPTION:	This is a joint FTA/FHWA project to provide real-time traffic condition information to dispatch centers of public transit agencies in the Detroit area. The agencies participating include Detroit DOT, Greyhound, UPS, Suburban Mobility Authority for Regional Transportation (SMART), and Commuter Transportation. MDOT's Metropolitan Transportation Center (MTC) collects traffic information on 32 miles of freeways through a buried inductive loop system. The information is then graphically displayed on computer monitors by color-coding individual freeway segment (link) occupancy. This project will demonstrate the ability to provide this information to public and private transit operators, inexpensively through phone lines, and will then monitor performance changes and evaluate the results.
STATUS:	The project began in June, 1992 with initial orders for computer hardware. Delivery and set-up is expected in February, 1994.
ESTIMATED TOTAL PROJECT COST:	$100,000
ANTICIPATED TOTAL FEDERAL SHARE:	$50,000
FEDERAL FUNDS THROUGH FY 93:	$0
CONTACT:	Sean Ricketson, FTA Headquarters, TTS-30, (202) 366-6678 Dr. Kunwar Rajendra, Michigan DOT, (517) 373-2247

MILWAUKEE SMART BUS

LOCATION: Milwaukee Country, Wisconsin

PARTNERS: Federal Transit Administration (FTA), Volpe National Transportation Systems Center

START DATE: September 1993

END DATE: September 1995

DESCRIPTION: This project will support the efforts of Milwaukee County to conduct data collection and evaluation of its Automatic Vehicle Location (AVL) and bus fleet management system. The project will enable Milwaukee County to participate in the Volpe National Transportation Systems Center (VNTSC) Operational Test Evaluation effort. Milwaukee County will conduct data collection and evaluation in coordination with the VNTSC National Evaluation Plan. The AVL system is design to track buses and ensure accurate schedule performance, increase overall operating efficiency, and assist in fleet management activities. As new technologies are operationally tested around the county, it is critical that standard evaluations are conducted to ensure consistency and compatibility of evaluation data.

STATUS: The first meeting between the VNTSC evaluation team and Milwaukee county officials will occur in spring 1994 to discuss plans for the evaluation effort.

ESTIMATED TOTAL PROJECT COST: $50,000

ANTICIPATED TOTAL FEDERAL SHARE: $50,000

FEDERAL FUNDS THROUGH FY 93: $0

CONTACT: Sean Ricketson, FTA Headquarters, TTS-30, (202) 366-6678
Jim Mackey, Milwaukee Department of Public Works, (414) 278-4931

MTA (BALTIMORE) SMART BUS

LOCATION: Baltimore, Maryland

PARTNERS: FTA, Mass Transit Administration (MTA) Baltimore

START DATE: May 1988 (R&D)

END DATE: May 1994

DESCRIPTION: MTA is implementing an Automatic Vehicle Location (AVL) system that will provide bus status information to the public while simultaneously improving bus schedule adherence and labor productivity. A prototype system involving 50 buses is being tested with LORAN-C receivers and 800-Mhz radios. The buses' location is determined by the receiver and the information is transmitted to a central dispatch center. Off-schedule buses are identified so corrective action can be taken. The system will be expanded to include all 900 Baltimore transit buses and Global Positioning System (GPS) inputs will replace LORAN-C for vehicle location.

STATUS: An initial deployment of the system to determine its potential is in operation with 50 buses, 4 supervisor automobiles and 2 consoles with map displays. The system involves route/independent tracking. Driver feedback on schedule can be used to control routes. Planning is underway to expand to include GPS for location for all transit vehicles, new dispatcher displays and new software. A contract is expected to be finalized by the 2nd quarter of FY 1994 for 200 buses and 70 light rail vehicles.

	R & D Project Phase	Deployment
ESTIMATED TOTAL PROJECT COST:	$2,500,000	$8,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$2,000,000	$6,400,000
FEDERAL FUNDS THROUGH FY 93:	$2,000,000	---

CONTACT: Denis Symes, FTA Headquarters, TTS-30, (202) 366-0232

NORFOLK MOBILITY MANAGER

LOCATION: Norfolk, Virginia

PARTNERS: Tidewater Transportation District Commission, FTA

START DATE: April 1989

END DATE: December 1993

DESCRIPTION: This is a project to operationally test and evaluate how transit and paratransit user subsidies can improve transportation services available to low-income transit riders. Subsidies provided directly to low-income people should encourage private operators to provide better transportation services. Part of the project is to allow Tidewater Regional Transit (TRT) to act as a mobility manager through its distribution of "Mobility Vouchers" to employers who, first, contribute to the face value of the vouchers and then, give them to qualified employees as a benefit. Employees can then use the vouchers to pay for the transit service of their choice. In addition to working through employers, the project has included an effort to work with social service agencies, especially in the medical area.

STATUS: In Phase II of this project, TRT implemented a Commuter Check program. This program was based on a federal tax code that allows an employer to subsidize an employee's transit commute on a tax-free basis up to $21 per month. TRT targeted many of the employers in the beachfront resort industries who have difficulty getting minimum wage employees from low-income areas to overcome transportation barriers to employment. This program has proven to be successful, as indicated by increasing sales.

ESTIMATED TOTAL PROJECT COST: $600,000

ANTICIPATED TOTAL FEDERAL SHARE: $500,000

FEDERAL FUNDS THROUGH FY 93: $500,000

CONTACT: Helen M. Tann, FTA Headquarters, TTS-30, (202) 366-0207

ROGUE VALLEY MOBILITY MANAGEMENT

LOCATION: Medford, Oregon

PARTNERS: Federal Transit Administration (FTA), Call-A-Ride, Upper Rogue Community Center, Ashland Senior Program, Group Ride Service, Metro Taxi, Ashland, Cascade, White City/Cascade Cab Company, Head Start, Rogue Valley Medical Center

START DATE: September 1991

END DATE: June 1995

DESCRIPTION: This project will demonstrate the Mobility Manager concept to integrate transportation users, providers, and funding sources. Advanced electronic technology will be used to record financial transactions and will include magnetic-stripe farecards. The initial phase will focus on providing transportation service to the elderly and disabled who are unable to use fixed route transit. Using existing hardware and readily developed software, the second phase will demonstrate the mobility manager concept for frequent transit riders in urban and rural environments.

STATUS: A project steering committee has been organized to assist in the development and management of the project. The participants include transportation providers, human service agencies, the Oregon DOT, a committee of the Metropolitan Planning Organization (MPO) and a neighboring county. Easy Street, Inc. has been selected to develop and install the software and hardware for the system. Operations are expected to begin in March 1994 on a limited basis initially. This project is being evaluated as part of an overall Advanced Public Transportation Systems evaluation program.

Given the limited market for public transportation in the Medford area, future efforts may be directed towards low-income individuals without vehicles. These efforts could include a centralized transportation information and referral system with electronic fare collection using magnetic strip or smart cards. Additionally, there may be potential for financial and economic analysis of the system, and for analyzing conditions of the project to determine the transferability of lessons learned.

ROGUE VALLEY MOBILITY MANAGEMENT (cont.)

ESTIMATED TOTAL PROJECT COST:	$935,000
ANTICIPATED TOTAL FEDERAL SHARE:	$460,000
FEDERAL FUNDS THROUGH FY 93:	$380,000
CONTACT:	Ron Boenau, FTA Headquarters, TTS-32, (202) 366-0195 Gary Shaff, Rogue Valley Council of Govts., (503) 664-6674

RTD (DENVER) SMART BUS

LOCATION: Denver, Colorado

PARTNERS: FTA, Regional Transportation District (RTD) Denver

START DATE: September 1991

END DATE: March 1994

DESCRIPTION: The RTD is installing an Automatic Vehicle Location (AVL) system, as part of an upgraded communications system, to provide bus location information to transit dispatchers to increase efficiency, ridership and passenger safety. Location information is supplied by a Global Positioning System (GPS), which uses a series of navigation satellites. The location of each bus is determined by a GPS receiver on the buses and is transmitted to a central dispatch center. Off-schedule buses are identified so corrective action can be taken to reroute buses when needed.

STATUS: A contract has been issued for the upgraded Communications and Automatic Vehicle Location System. The system will be installed in the RTD's fleet of 788 buses and 28 supervisory vehicles. Map displays showing each vehicle's location will permit the dispatcher to control the buses and their schedules. In the event of an on-bus emergency, the driver can summon help through a silent alarm that identifies the bus and its location so that police can be directed to the bus. An evaluation of the system is being initiated by the FTA in close cooperation with the RTD. Installation of equipment on all buses is complete; 208 vehicles are in full AVL operation. System acceptance is scheduled for mid-1994.
A future expansion will include passenger information and interactive displays.

ESTIMATED TOTAL PROJECT COST: $10,520,000

ANTICIPATED TOTAL FEDERAL SHARE: $8,440,000

FEDERAL FUNDS THROUGH FY 93: $8,320,000

CONTACT: Denis Symes, FTA Headquarters, TTS-30, (202) 366-0232

SUBURBAN MOBILITY AUTHORITY FOR REGIONAL TRANSPORTATION (SMART) PROJECT

LOCATION:	Detroit, Michigan
PARTNERS:	FHWA, SMART
START DATE:	December 1993
END DATE:	June 1996
DESCRIPTION:	Project activities will provide for a Dispatch System with automated reservations, scheduling and dispatch for paratransit operation, and an Automatic Vehicle Location (AVL) system to allow tracking the fleet. These capabilities will eventually be extended to affiliated agencies. The project will also establish an 800 number, interfaced with the dispatch system with potential to refer customers to regional paratransit services. The project will also develop interfaces with other IVHS initiatives in the region, including FAST-TRAC and MDOT's Metropolitan Transportation Center. The project will also provide for innovative Traveler Information Services, including SMARTCARD, to tie other uses together.
STATUS:	SMART Application has been submitted to FHWA. Partnership agreement being processed and work plan being developed.
ESTIMATED TOTAL PROJECT COST:	$5,625,000
ANTICIPATED TOTAL FEDERAL SHARE:	$4,500,000
FEDERAL FUNDS THROUGH FY 93:	$4,500,000
CONTACT:	Sean Ricketson, FTA Headquarters, (202) 366-6678 Doreen Tyrrell, SMART, (313) 223-2121 Kimberly Johnson, Michigan DOT - Bus Transit Division, (517) 373-8796

ELECTRONIC PAYMENT

ELECTRONIC PAYMENT

- Electronic Payment Services

  Allows travelers to pay for transportation services electronically with "smart cards."

  This service will foster intermodal travel by providing a common electronic payment medium for all transportation modes and functions, including tolls, transit fares, and parking. The service provides for a common service fee and payment structure using "smart cards." Such systems could be truly multi-use, allowing other personal financial transactions on the same card. The flexibility that electronic payment services offer will also facilitate travel demand management, if conditions warrant. They will enable relatively easy application of road pricing policies which could influence departure times and mode selection.

Electronic Payment

(Research Development)

ADVANCED FARE PAYMENT MEDIA, I

DESCRIPTION: This is the first of two FTA projects to investigate and research various forms of advanced fare payment media for transit applications. The focus is upon advanced card systems to improve the efficiency of fare collection and provide measurable benefits to the transit provider and rider alike. There will be in-depth descriptions and analyses of all types of advanced media, including infrared, RF/microwave, contact smart cards, proximity cards and others. The operating environment for transit fare payment systems will be defined and system requirements specified. In addition, the project will categorize the merits of different advanced fare media, and comment on the future potential for each. The project will address smart card use both by bus, rail, paratransit, and integrated transit systems, concentrating on transit operations in the eastern half of the country.

START DATE: August 1991

END DATE: January 1992

STATUS: The first phase of the project is complete, and advancement into Phase II is dependent on available funds and successful competition against other applicants.

ESTIMATED TOTAL PROJECT COST: $50,000

ANTICIPATED TOTAL FEDERAL SHARE: $50,000

FEDERAL FUNDS THROUGH FY 93: $50,000

CONTRACTOR: GLH Inc., Falls Church, Virginia

CONTACT: Sean Ricketson, FTA Headquarters, TTS-30, (202) 366-6678

ADVANCED FARE PAYMENT MEDIA, II

DESCRIPTION: This project will develop an operational test of a computerized system for integrating various advanced fare media technologies and processing systems. Tests will demonstrate onboard electronic transit fare and data collection, and on-site travel support services such as congestion pricing, parking management and data collection. The project will investigate systems application fare reciprocity among service providers and real-time operational funds allocations and transfers. Evaluations of the tests will be conducted by an independent university team.

START DATE: March 1992

END DATE: July 1992

STATUS: Prototype development and testing is currently underway, including card readers, printers, and radio-frequency (RF) card technology.
Following tests and evaluations, issues and applications will be recommended for further research and problem solving to increase the potential for viable integrating electronic advanced fare media with travel support services, information access, and the development of regional or national travel passes.

ESTIMATED TOTAL PROJECT COST: $50,000

ANTICIPATED TOTAL FEDERAL SHARE: $50,000

FEDERAL FUNDS THROUGH FY 93: $50,000

CONTRACTOR: Echelon Industries Incorporated, Diamond Bar, California

CONTACT: Sean Ricketson, FTA Headquarters, TTS-30, (202) 366-6678

Electronic Payment

(Operational Tests)

CHATTANOOGA SMART CARD

DESCRIPTION: This project will assist the Chattanooga Area Regional Transportation Authority (CARTA) in its ongoing "Downtown Parking and Circulator" effort. This project will support the planning and development of a smart card fare and parking system to be used to increase the appeal of transit and park-and ride lots in the downtown area. The project will examine using smart cards for both the payment of parking fees and for transit fares on the downtown circulator. Presently, CARTA provides a downtown shuttle system that runs from the north end of downtown to the south end. CARTA is constructing "auto intercepts," of park and ride-lots located at key entry points into the downtown area. These intercepts will relieve congestion and act as a boarding area for public transportation. The Chattanooga Smart Card project will tie into this developing effort.

START DATE: January 1993

END DATE: April 1995

STATUS: Analysis of card system is ongoing, with results expected in summer 1994.

Based on the results of the initial analysis, the feasibility of deploying an advanced fare media for the downtown shuttle and for other CARTA transit services will be examined.

ESTIMATED TOTAL PROJECT COST: $93,750

ANTICIPATED TOTAL FEDERAL SHARE: $75,000

FEDERAL FUNDS THROUGH FY 93: $0

CONTACT: Sean Ricketson, FTA Headquarters, TTS-30, (202) 366-6678
Art Barnes, Chattanooga Transportation Authority, (615) 698-2749

TWIN CITIES SMART TRAVELER

LOCATION: St. Paul, Minnesota

PARTNERS: Federal Transit Administration (FTA), Minnesota Department of Transportation, Metropolitan Transit Commission, University of Minnesota

START DATE: September 1992

END DATE: April 1993

DESCRIPTION: The Regional Transit Board conducted a preliminary study of the potential of smart cards to improve paratransit service. Four objectives are identified: first, to find the best use of smart cards in fare payment; second, to evaluate the potential of smart cards in an electronic billing system; third, to study the potential of monitoring contractor performance through smart card systems; and fourth, to study smart card potential on standard transit routes.

STATUS: The Regional Transit Board contracted with Applied Systems Institute, Inc., to conduct the study. Because of changes in the administration of paratransit services in the Twin Cities, the project shifted its focus to assess smart card benefits for individual paratransit operators. A written report is complete and will be published in spring 1994.

Depending on the results of the final report, the information gained from this project may be used in the development of an integrated electronic fare and billing system to be tested by the Regional Transit Board. If an operational test is developed, it may be linked to Minnesota DOT's statewide IVHS effort, Minnesota Guidestar.

ESTIMATED TOTAL PROJECT COST: $40,000

ANTICIPATED TOTAL FEDERAL SHARE: $40,000

FEDERAL FUNDS THROUGH FY 93: $40,000

CONTACT: Sean Ricketson, FTA Headquarters, TTS-30, (202) 366-6678

COMMERCIAL VEHICLE OPERATIONS

COMMERCIAL VEHICLE OPERATIONS

- Commercial Vehicle Electronic Clearance

  Facilitates domestic and international border clearance, minimizing stops.

  This service will enable transponder-equipped trucks and buses to have their safety status, credentials, and weight checked at mainline speeds. Vehicles that are safe and legal and have no outstanding out-of-service citations will be allowed to pass the inspection/weigh facility without delay.

  By working with Mexico and Canada, a more efficient traffic flow would be provided at border crossings and the deployment of technologies in these countries could ultimately prevent overweight, unsafe, or improperly registered vehicles from entering the United States.

- Automated Roadside Safety Inspection

  Facilitates roadside inspections.

  Automated roadside inspections would allow "real-time" access at the roadside to the safety performance record of carriers, vehicles, and drivers. Such access will help determine which vehicle or driver should be stopped for an inspection, as well as ensuring timely correction of previously identified problems.

  This service would also automate as many items as possible of the manual inspection process. It would, for example, allow for more rapid and accurate inspection of brake performance at the roadside. Through the use of sensors and diagnostics, it would efficiently check vehicle systems and driver requirements and ultimately driver alertness and fitness for duty.

- Commercial Vehicle Administrative Processes

  Provides electronic purchasing of credentials and automated mileage and fuel reporting and auditing.

  Electronically purchasing credentials would provide the carrier with the capability to electronically purchase annual and temporary credentials via computer link. It will reduce burdensome paperwork and processing time for both the States and the motor carriers.

For automated mileage and fuel reporting and auditing, this service would enable participating interstate carriers to electronically capture mileage, fuel purchased, trip, and vehicle data by State. It would also automatically determine mileage traveled and fuel purchased in each State, for use by the carrier in preparing fuel tax and registration reports to the States. The administrative burden on carriers to collect and report mileage and fuel purchased within each State is significant. This service would significantly reduce the cost for collecting both types of data.

- On-Board Safety Monitoring

Senses the safety status of a commercial vehicle, cargo, and driver.

On-board systems would monitor the safety status of a vehicle, cargo, and driver at mainline speeds. Vehicle monitoring would include sensing and collecting data on the condition of critical vehicle components such as brakes, tires, and lights, and determining thresholds for warnings and countermeasures. Cargo monitoring would involve sensing unsafe conditions relating to vehicle cargo, such as shifts in cargo while the vehicle is in operation. Driver monitoring is envisioned to include the monitoring of driving time and alertness using non-intrusive technology and the development of warning systems for the driver, the carrier, and the enforcement official. A warning of unsafe condition would first be provided to the driver, then to the carrier and roadside enforcement officials and would possibly prevent an accident before it happens. This service would minimize driver- and equipment-related accidents for participating carriers.

- Commercial Fleet Management

Provides communications between drivers, dispatchers, and intermodal transportation providers.

The availability of real-time traffic information and vehicle location for commercial vehicles would help dispatchers to better manage fleet operations by helping their drivers to avoid congested areas and would also improve the reliability and efficiency of carriers pickup-and-delivery operations. The benefits from this service would be substantial for those intermodal and time-sensitive fleets who can use these IVHS technologies to make their operations more efficient and reliable.

- Hazardous Material Incident Notification

Provides immediate notification of an incident and description of hazardous materials involved.

This service would enhance the safety of shipments of hazardous materials by providing enforcement and response teams with timely, accurate information on cargo contents to enable them to react properly in emergency situations. The system would focus on determining when an incident involving a truck carrying hazardous material occurs, the nature and location of the incident, and the material or combination of materials involved so that the incident can be handled properly.

Commercial Vehicle Operations

(Research and Development)

COMMERCIAL VEHICLE FLEET MANAGEMENT AND INFORMATION SYSTEMS

DESCRIPTION: Commercial and public fleet management problems and needs that might be addressed through advanced technologies will be identified through case studies and in-depth interviews with fleet managers, dispatchers, and drivers. Phase II will assess the feasibility and requirements of potential technologies to address those needs that warrant public sector involvement. Dispatch, routing, tracking, driver scheduling, maintenance management, and administration operations will be examined for interstate shipping, urban goods movement, intermodal operations and public service fleets (e.g. highway maintenance trucks, school buses).

START DATE: September 27, 1993

END DATE: June 30, 1995

STATUS: Various types of fleet operations have been identified and a preliminary indication of case study candidates has been made.

ESTIMATED TOTAL PROJECT COST: $405,000

ANTICIPATED TOTAL FEDERAL SHARE: $405,000

FEDERAL FUNDS THROUGH FY 93: $405,000

CONTRACTOR: Cambridge Systematics, Inc. (prime), National Private Truck Council and the Trucking Research Institute of ATA

CONTACT: Davey Warren, FHWA R&D, HSR-10, (703) 285-2426

COMMERCIAL VEHICLE SAFETY SYSTEMS

DESCRIPTION:	The objective of the agreement with Sandia National Laboratories is to provide technical support activities related to the identification, development, and evaluation of various technologies and systems as they apply to commercial vehicle safety and operation.
START DATE:	July 1992
END DATE:	July 1994
STATUS:	Research is ongoing to explore the opportunities for applying advanced technologies towards the improvement of the truck inspection process.
ESTIMATED TOTAL PROJECT COST:	$1,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$1,000,000
FEDERAL FUNDS THROUGH FY 93:	$1,000,000
CONTRACTOR:	Sandia National Laboratories
CONTACT:	Michael Freitas, FHWA R&D, HSR-10, (703) 285-2421

ELECTRONIC COMMERCIAL VEHICLE CREDENTIAL SYSTEM ARCHITECTURE

DESCRIPTION:	This study will develop detailed system designs for systems that will provide uniform electronic credentials (i.e. one-stop shopping) for motor carriers and a nationwide system for verifying credentials at mainline highway speeds (transparent borders).
START DATE:	January 1994
END DATE:	July 1995
STATUS:	In the process of developing a draft project plan, and collecting project requirements.
ESTIMATED TOTAL PROJECT COST:	$1,296,000
ANTICIPATED TOTAL FEDERAL SHARE:	$1,296,000
FEDERAL FUNDS THROUGH FY 93:	$0
CONTRACTOR:	Applied Physics Laboratory
CONTACT:	Michael Curtis, FHWA R&D, HSR-13, (703) 285-2991

SYSTEMS PLANNING FOR AUTOMATED COMMERCIAL VEHICLE LICENSING AND PERMITTING SYSTEMS

DESCRIPTION: The objective of this study is to develop a systems plan for the development of various automated licensing and permit compliance and verification systems. This study will include all the necessary activities leading up to the actual hardware and software design for such systems. The study will not include any actual system design or testing efforts.

START DATE: May 1992

END DATE: August 1994

STATUS: The contractor has completed the initial phase of this contract which included identifying the major tax and regulatory requirements facing motor carriers; examining the agreements through which states share information on motor carriers; describing the current and proposed Commercial Vehicle Operations (CVO) related programs; reviewing system architecture approaches to the organized exchange of commercial vehicle information; and developing recommended general directions for the development of a national plan for advancing CVO user services.

ESTIMATED TOTAL PROJECT COST: $420,000

ANTICIPATED TOTAL FEDERAL SHARE: $420,000

FEDERAL FUNDS THROUGH FY 93: $420,000

CONTRACTOR: Cambridge Systematics, Inc.

CONTACT: Michael Freitas, FHWA R&D, HSR-10, (703) 285-2421

Commercial Vehicle Operations

(Operational Tests)

ADVANTAGE I-75

LOCATION: I-75 in Florida, Georgia, Tennessee, Kentucky, Ohio, Michigan, and Ontario, Canada

PARTNERS: FHWA, Florida, Georgia, Tennessee, Kentucky, Ohio, Michigan, Ontario, Motor Carrier Industry

START DATE: January 25, 1991

END DATE: March 1, 1997

DESCRIPTION: Advantage I-75 represents a multi-state partnership of public and private sector interests along the I-75 corridor. The project will facilitate motor-carrier operations by allowing transponder-equipped and properly documented trucks to travel any segment along the entire length of I-75 at mainline speeds with minimal stopping at weigh/inspection stations. Electronic clearance decisions at downstream stations will be based on truck size and weight measurements taken upstream and on computerized checking of operating credentials in each State. Advantage I-75 features the application of transponder technology and decentralized control, with each State retaining its constitutional and statutory authority relative to motor carriers and their operations.

STATUS: Final design of the Mainline Automated Clearance System (MACS) is complete. The AVI system has been purchased and is being installed at weigh stations along the I-75 corridor.

ESTIMATED TOTAL PROJECT COST: $10,958,000

ANTICIPATED TOTAL FEDERAL SHARE: $7,700,000

FEDERAL FUNDS THROUGH FY 93: $4,024,685

CONTACT: Susan Mooney, FHWA Region 4, HES-04, (404) 347-4075
Eddie Bruce, FHWA, Region 4, HES-04, (404) 347-4075
David Smith, KY. Transportation Cabinet., (502) 564-3730
Don Hartman, KY. Transportation Center, (606) 257-3729

DETROIT AND ST. CLAIR RIVERS INTERNATIONAL BORDER CROSSING STUDY

LOCATION: Detroit and Port Huron, Michigan

PARTNERS: FHWA, Michigan DOT, Transport Canada, Province of Ontario Ministry of Transportation, U.S. Customs and Immigration Services, Canadian Custom and Immigration Services, Detroit/Windsor Tunnel Authority, Ambassador Bridge Authority, Bluewater Bridge Authority

START DATE: September 1992

END DATE: July 1994 (Phase I)

DESCRIPTION: Phase I of the project is to study the institutional issues of applying new technologies to the International Border at the Detroit/Port Huron, Michigan frontier. The project envisions an automated system, primarily paperless, using the latest technologies to enhance border crossing by commercial and private vehicles. The consultant is studying innovative and creative solutions related to the border crossing operations for opportunities related to system integration and multi-use of information by a variety of users. Four major aspects of the study include assessment of Automatic Toll Collection, Automated Customs Clearance of Commercial Vehicles, Automated Immigration Clearance for Pre-Screened Commercial Vehicle Operators, and Automated Customs and Immigration Clearance for Pre-Screened Commuters.

STATUS: The consultant is nearing completion of the Phase I study. Deliverables include System Design, Users Requirements, System Architecture, System Implementation Options, and Procurement Guidelines for Phase II.

ESTIMATED TOTAL PROJECT COST: $130,000

ANTICIPATED TOTAL FEDERAL SHARE: $52,500

FEDERAL FUNDS THROUGH FY 93: $52,500

CONTACT: Martin Monahan, FHWA Region 5, HES-05, (708) 206-3218
Dr. Kunwar Rajendra, Michigan DOT, (517) 373-2247

HELP / CRESCENT

LOCATION: British Columbia, Washington State, Oregon, California, Arizona, New Mexico, Texas

PARTNERS: Arizona DOT, California DOT (CalTrans), Colorado DOT, Idaho DOT, Iowa DOT, Minnesota DOT, Nevada DOT, New Mexico SHTD, Oregon DOT, Pennsylvania DOT, Texas SDHPT, Utah DOT, Virginia DOT, Washington State DOT, Motor Carrier Industry, Transport Canada, FHWA

START DATE: 1991

END DATE: 1993

DESCRIPTION: HELP (Heavy Vehicle Electronic License Plate Program) is a multistate, multi-national research effort to design and test an integrated heavy vehicle monitoring system that uses Automatic Vehicle Identification (AVI), Automatic Vehicle Classification (AVC), and Weigh-In-Motion (WIM) technology. The test phase of HELP is known as the Crescent Project. The Crescent Project includes approximately 40 equipped sites ranging from British Columbia southward along I-5 to California and then eastward along I-10 to Texas, branching onto I-20. Data gathered from the WIM, AVI and AVC is processed by a central computer, and then used by the state governments for credential checking, weight enforcement, and planning information and by the motor carrier industry for fleet management purposes. HELP's ultimate goal is to have a system in which a legal truck can drive through the entire network without having to stop at weigh stations or ports-of-entry.

STATUS: AVI, WIM, and AVC equipment was installed at sites in Washington, Oregon, California, Texas, New Mexico and Arizona as part of Phase IB and Phase II efforts. Approximately 2,000 trucks were equipped with transponders during the test period, which ended on September 30,1993. During the test period, the performance of the integrated system and the benefits to the State agencies and the motor carriers was evaluated. Evaluation reports are currently being finalized. Operation of the Crescent System and other technical activities of HELP have been turned over to a new private organization known as HELP, Inc.

HELP / CRESCENT (cont.)

ESTIMATED TOTAL PROJECT COST:	$22,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$5,850,000
FEDERAL FUNDS THROUGH FY 93:	$5,850,000
CONTACT:	Ed Kashuba, FHWA Headquarters, HPM-30, (202) 366-0175 Mike Freitas, FHWA R&D, HSR-10, (703) 285-2421 Jeff Lindley, FHWA Region 9, HPD-09, (415) 744-2659 Dennis Mittlestedt, FHWA Arizona Division, HDA-AZ, (602) 379-3646 Doug McKelvey, FHWA Headquarters, HIA-10, (202) 366-9246 Bob Bothman, HELP, (503) 244-7206 John Van Berkel, CalTrans, (916) 654-5548

ON-BOARD AUTOMATED MILEAGE TEST

LOCATION: Iowa-Minnesota-Wisconsin

PARTNERS: Iowa DOT, Rockwell International, Rand McNally-TDM, Iowa Transportation Center, Minnesota Department of Public Safety, Wisconsin DOT, ATA Foundation, Iowa Motor Truck Association, Minnesota Trucking Association, Wisconsin Motor Carriers Association, FHWA

START DATE: 1993

END DATE: 1996

DESCRIPTION: This 3-state project will test and evaluate the effectiveness of using the Global Positioning System (GPS) and first-generation on-board computers to record the miles driven within a state for fuel tax allocation purposes in a manner acceptable to state auditors. The system will automatically record mileage by specific roadway as well as state border crossings using GPS and vehicle location technology with a map-matching algorithm.

STATUS: Agreement between the FHWA and Iowa DOT has been finalized and initial design and evaluation documents are underway.

ESTIMATED TOTAL PROJECT COST: $1,618,974

ANTICIPATED TOTAL FEDERAL SHARE: $1,068,239

FEDERAL FUNDS THROUGH FY 93: $0

CONTACT: John Carkin, FHWA Region 7, HMC-07, (816) 926-7896
Bruce Baldwin, FHWA Region 7, HEO-07, (816) 926-7955
Bill McCall, Iowa Transportation Center, (515) 294-8103

PASS

LOCATION: Ashland Port-of-Entry, Northbound I-5

PARTNERS: Oregon DOT, FHWA, Motor Carrier Industry

START DATE: 1992

END DATE: 1995

DESCRIPTION: PASS (Port-of-Entry Advanced Sorting System) is a test of mainline sorting at Oregon's Ashland Port-of-Entry on northbound I-5. The project will examine integrating Automatic Vehicle Identification (AVI), Weigh In Motion (WIM), Automated Vehicle Classifications (AVC) and On-Board Computers (OBC) to identify, weigh, classify and direct selected heavy vehicles in advance of weigh stations and ports-of-entry. Legally operating trucks participating in the project will be directed, by the use of an in-vehicle device, to bypass the port and the static scale weighing process, resulting in time savings for both the carrier and the port personnel.

STATUS: International Road Dynamics (IRD) was selected as the contractor. A draft work plan has been developed. A white paper on Double Threshold Weigh-In-Motion was prepared to address the need or value of having two WIM stations on the main line instead of only one. Construction of PASS features at the Ashland port-of-entry has begun.

ESTIMATED TOTAL PROJECT COST: $572,000

ANTICIPATED TOTAL FEDERAL SHARE: $350,000

FEDERAL FUNDS THROUGH FY 93: $350,000

CONTACT: Ed Fischer, FHWA Region 10, HEO-10, (503) 326-2071
Milan Krukar, Oregon DOT, (503) 378-4082

EMERGENCY MANAGEMENT

EMERGENCY MANAGEMENT

- Emergency Vehicle Management

  Reduces the time it takes emergency vehicles to respond to incidents.

  This service provides fleet management, route guidance, and signal priority for emergency vehicles. Fleet management will improve the display of emergency vehicle locations and help dispatchers send the units that can most quickly reach an incident site. Route guidance directs emergency vehicles to an incident location, while signal priority optimize the traffic signal timing in an emergency vehicle's route. Primary users of this service include police, fire, and medical units.

- Emergency Notification and Personal Security

  Provides immediate notification of an incident and an immediate request for assistance.

  This service includes two capabilities: driver and personal security, and automatic collision notification. Driver and personal security capabilities provide for user initiated distress signals for incidents like mechanical breakdowns or car jackings. Automatic collision notification identifies a collision and automatically sends information regarding location, nature, and severity to emergency personnel.

Emergency Management

(Operational Tests)

PERFORMANCE SPECIFICATIONS: SYSTEMS TO ENHANCE EMERGENCY MEDICAL SERVICE RESPONSE

DESCRIPTION:	The objectives of this project are to (1) investigate the feasibility of equipping motor vehicles and emergency medical service (EMS) dispatch centers with high-technology systems to enhance EMS response, e.g., a communications system for automatically summoning EMS response following a crash and providing reliable data on crash location, especially in rural areas, and (2) conduct operational tests of systems to improve EMS response. The systems tested will have the capability to automatically request emergency assistance.
START DATE:	June 1993
END DATE:	October 1998
STATUS:	Assessment of the state-of-the-art.
ESTIMATED TOTAL PROJECT COST:	To be determined.
ANTICIPATED TOTAL FEDERAL SHARE:	To be determined.
FEDERAL FUNDS THROUGH FY 93:	$300,000
CONTRACTOR:	Applied Physics Laboratory of the Johns Hopkins University
CONTACT:	Art Carter, NHTSA Headquarters, NRD-51, (202) 366-5669

ADVANCED VEHICLE SAFETY SYSTEMS

ADVANCED VEHICLE SAFETY SYSTEMS

- Longitudinal Collision Avoidance

  Helps prevent head-on and rear-end collisions between vehicles, or between vehicles and other objects or pedestrians.

  This service helps reduce the number and severity of collisions. It includes the sensing of potential or impending collisions, prompting a driver's avoidance actions, and temporarily controlling the vehicle.

- Lateral Collision Avoidance

  Helps prevent collisions when vehicles leaving their lane of travel.

  This service provides crash warnings and controls for lane changes and road departures. It will help reduce the number of lateral collisions involving two or more vehicles, or crashes involving a single vehicle leaving the roadway.

  When a driver changes lanes, a situation display can continuously monitor the vehicle's blind spot, and drivers can be actively warned of an impending collision. If needed, automatic control can effectively respond to situations very rapidly. Warning systems can also alert a driver to an impending road departure, provide help in keeping the vehicle in the lane, and ultimately provide automatic control of steering and throttle in dangerous situations.

- Intersection Collision Avoidance

  Helps prevent collisions at intersections.

  This service warns drivers of imminent collisions when approaching or crossing an intersection that has traffic control (e.g., stop signs or a traffic signal). This service also alerts the driver when the proper right-of-way at the intersection is unclear or ambiguous.

- Vision Enhancement for Crash Avoidance

  Improves the driver's ability to see the roadway and objects that are on or along the roadway.

  Improved visibility will allow drivers to avoid potential collisions with other vehicles or obstacles in roadway, as well as help the driver comply with traffic signs and signals. This service requires in-vehicle equipment for sensing potential hazards, processing this information, and displaying it in a way that is useful to a driver.

- Safety Readiness

  Provides warnings about the condition of the driver, the vehicle, and the roadway.

  In-vehicle equipment will unobtrusively monitor a driver's condition and provide a warning if he or she is becoming drowsy or otherwise impaired. This service could also internally monitor critical components of the automobile, and alert the driver to impending malfunctions. Equipment within the vehicle could also detect unsafe road conditions, such as bridge icing or standing water on the roadway, and provide a warning to the driver.

- Pre-Crash Restraint Deployment

  Anticipates an imminent collision and activates passenger safety systems before the collision occurs.

  This service identifies the velocity, mass, and direction of the vehicles or objects involved in a potential crash, and the number, location, and major physical characteristics of any occupants. Responses include tightening lap-shoulder belts, arming and deploying air bags at the optimal pressure, and deploying roll bars.

- Automated Vehicle Operation

  Provides a fully automated, "hands-off," operating environment.

  Automated vehicle operations is a long term goal of IVHS which would provide vast improvements in safety by creating a nearly accident free driving environment. Drivers could buy vehicles with the necessary instrumentation or retrofit an existing vehicle. Vehicles that are incapable of automated operation, during some transition period, would drive in lanes without automation.

Advanced Vehicle Safety Systems

(Research and Development)

ADVANCED VEHICLE CONTROL SYSTEMS (AVCS) INFRASTRUCTURE AND TRAFFIC IMPACTS

DESCRIPTION: Several types of AVCS systems are under study by NHTSA, including run-off-the-road warning/avoidance and intersection collision warning/avoidance systems. This major research effort is expected to raise numerous issues concerning infrastructure interactions with these type systems. In many cases, system concept feasibility will hinge upon this infrastructure element. This effort will address these infrastructure issues, in close coordination with NHTSA. In addition, AVCS will be conceptualized and existing concepts evaluated with a focus on improved traffic flow. The contracts will be structured to conduct work on a task order basis; individual tasks will be generated based on the status of ongoing AVCS efforts.

START DATE: To be determined.

END DATE: To be determined.

STATUS: Award expected in April 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: To be determined.

CONTACT: J. Richard Bishop, FHWA R&D, HSR-12, (703) 285-2680

ADVANCED (VISION-BASED) VEHICLE CONTROL SYSTEM, PHASE I

DESCRIPTION: Project with National Institutional of Standards and Technology to investigate the application of machine vision to lateral control of vehicles on a roadway.

START DATE:

END DATE:

STATUS: Project complete.

ESTIMATED TOTAL PROJECT COST: $200,000

ANTICIPATED TOTAL FEDERAL SHARE: $200,000

FEDERAL FUNDS THROUGH FY 93: $200,000

CONTACT: J. Richard Bishop, FHWA R&D, HSR-10, (703) 285-2680

ADVANCED (VISION-BASED) VEHICLE CONTROL SYSTEM, PHASE II

DESCRIPTION:	The plausibility of adapting machine vision techniques developed for Defense applications to autonomous road following will be assessed, as a potential component of an AVCS which minimizes infrastructure investment. This work will be accomplished through and Interagency agreement with the NIST.
START DATE:	September 4, 1992
END DATE:	September 4, 1993
STATUS:	Project complete.
ESTIMATED TOTAL PROJECT COST:	$600,000
ANTICIPATED TOTAL FEDERAL SHARE:	$600,000
FEDERAL FUNDS THROUGH FY 93:	$660,000
CONTRACTOR:	
CONTACT:	J. Richard Bishop, FHWA R&D, HSR-10, (703) 285-2680

ANALYSIS OF EXISTING ACCIDENT DATABASES

DESCRIPTION: The goals of this project are to: (1) analyze existing NHTSA and state accident databases to determine vehicle, driver, and environmental contributing factors (and their interactions) and characteristics of target crashes of conventional and IVHS crash avoidance countermeasures, and (2) assess the effects of existing vehicle design features on the incidence and severity of crashes in the "real world."

START DATE: Continuing effort

END DATE: On-going

STATUS: Reports on rear-end, backing, and lane change crashes are completed; similar reports on single vehicle roadway departure and intersection crashes are under development.

ESTIMATED TOTAL PROJECT COST: To be determined.

ANTICIPATED TOTAL FEDERAL SHARE: To be determined.

FEDERAL FUNDS THROUGH FY 93: $265,000

CONTRACTOR: Information Management Consultants

CONTACT: Ron Knipling, NHTSA Headquarters, NRD-53, (202) 366-4733

AUTOMATED HIGHWAY SYSTEM (PRECURSOR SYSTEMS ANALYSES)

DESCRIPTION: The Automated Highway System (AHS) program is a broad national effort to provide the basis for, and transition to, the next major performance upgrade of the U.S. vehicle/highway system, through the use of automated vehicle control technology. The long range goal is to significantly improve the safety and efficiency of the nation's surface transportation system through a national effort that best ensures the early, successful deployment of AHS. The AHS program is broadly structured into three phases: 1) Analysis Phase, 2) Systems Definition Phase, and 3) Operational Evaluation Phase. As part of the Analysis Phase, the Precursor Systems Analyses (PSA) are being performed to identify issues and risks associated with AHS. The AHS PSA studies are focused on the following sixteen activity areas: a) urban and rural AHS comparison, b) automated check-in, c) automated check-out, d) lateral and longitudinal control analysis, e) malfunction management and analysis, f) commercial and transit AHS analysis, g) comparable systems analysis, h) AHS roadway deployment analysis, i) impact of AHS on surrounding non-AHS roadways, j) AHS entry/exit implementation, k) AHS roadway operational analysis, l) vehicle operational analysis, m) alternative propulsion systems impact, n) AHS safety issues, o) institutional and societal aspects, and p) preliminary cost/benefit factors analysis. The results of these PSA studies will support and facilitate subsequent activities in the Systems Definition Phase of the AHS program.

START DATE: 1993

END DATE: Fall 1994

STATUS: From July 1993 through September 1993, FHWA awarded 15 AHS PSA contracts. In addition to the sixteen activity areas mentioned above, three "other" activities are being studied: 1) differential carrier phase global positioning system (GPS) applications to lateral and longitudinal control, 2) system level AHS model integration, and 3) knowledge based systems applications to AHS. Several contractors are addressing each of the activity areas. This overlap will add value to the overall body of research, in that each discrete effort will provide a different perspective and emphasis in identifying and analyzing issues and risks. Further, two teams were selected to address all sixteen activity areas. These teams are expected to generate additional insights into the issues because of the extensive interdependencies across the activity areas, which can be addressed most effectively within a single contract team.

AUTOMATED HIGHWAY SYSTEM (PRECURSOR SYSTEMS ANALYSES) cont.

ESTIMATED TOTAL PROJECT COST: $14,100,000

ANTICIPATED TOTAL FEDERAL SHARE: $14,100,000

FEDERAL FUNDS THROUGH FY 93: $14,100,000

CONTRACTOR: The 15 prime contractors and the activity areas they are studying are as follows: Battelle (a,e,h,i,j,k,n,o), BDM (g,o), Calspan (all 16), Delco (all 16), Honeywell (b,c,e,g), Martin Marietta (d), Northrop (b), PATH (a,h,j,p), Raytheon (b,c,d,e,f,j,l,n, other [knowledge based]), Rockwell (d,e,l), SAIC (o), SRI (other [differential carrier phase GPS]), TASC (other [model integration]), TRW (m), UC Davis (k)

CONTACT: J. Richard Bishop, FHWA R&D, HSR-12, (703) 285-2680

AUTOMATED HIGHWAY SYSTEM CONSORTIUM

DESCRIPTION: The Automated Highway System (AHS) program is a broad national effort to provide the basis for, and transition to, the next major performance upgrade of the U.S. vehicle/highway system, through the use of automated vehicle control technology. The long range goal is to significantly improve the safety and efficiency of the nation's surface transportation system through a national effort that best ensures the early, successful deployment of AHS. The AHS program is broadly structured into three phases: 1) Analysis Phase, 2) Systems Definition Phase, and 3) Operational Evaluation Phase. To accomplish the Systems Definition Phase, the FHWA is seeking to form a cooperative relationship with a national consortium that will provide the management and technical skills needed to conduct this phase of the AHS program.

START DATE: 1994

END DATE: To be determined.

STATUS: The FHWA has issued a Request for Applications (RFA) in order to select an AHS Consortium. Applications are due to FHWA in March 1994. A responding consortium must be able to (1) provide leadership and focus to the nation's AHS effort; (2) represent the major categories of "stakeholders" that would design, build, deploy, and operate an AHS: (3) understand and pursue the vision, goals, purpose, and desired cooperative relationships of the program; and (4) demonstrate the capability of managing this national effort and achieving the program's goals. A cooperative agreement with the selected consortium will be completed by the end of FY 94.

ESTIMATED TOTAL PROJECT COST: $180,000,000

ANTICIPATED TOTAL FEDERAL SHARE: $145,000,000

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: To be determined.

CONTACT: J. Richard Bishop, FHWA R&D, HSR-12, (703) 285-2680

CRASH AVOIDANCE AND THE OLDER DRIVER

DESCRIPTION:	The purpose of this initiative is to analyze the traffic crash experience of older drivers, assess their capabilities and limitations as drivers, and identify and evaluate vehicle design features that will ensure the safety of their driving while accommodating their mobility needs.
START DATE:	September 1993
END DATE:	April 1997
STATUS:	Phase I (Assessment) in progress.
ESTIMATED TOTAL PROJECT COST:	To be determined.
ANTICIPATED TOTAL FEDERAL SHARE:	To be determined.
FEDERAL FUNDS THROUGH FY 93:	$125,000
CONTRACTOR:	Phase I (Assessment): Battelle; Phase II (Data Collection): To be determined.
CONTACT:	Ron Knipling, NHTSA Headquarters, NRD-53, (202) 366-4733

DESIGN DRIVER DATABASE

DESCRIPTION:	The objective of this NHTSA project is to establish a database documenting the behavior and performance of the driving population to provide better information on the range of driver capabilities and limitations to be accommodated in the design of vehicle subsystems. This is a joint project with the Federal Highway Administration.
START DATE:	October 1991
END DATE:	March 1994
STATUS:	A final report is being printed.
ESTIMATED TOTAL PROJECT COST:	$20,000
ANTICIPATED TOTAL FEDERAL SHARE:	$20,000
FEDERAL FUNDS THROUGH FY 93:	$20,000
CONTRACTOR:	Transportation Research Board
CONTACT:	Michael Perel, NHTSA Headquarters, NRD-52, (202) 366-4733

DEVELOP AN ANALYTICAL MODELING FRAMEWORK / COLLISION AVOIDANCE SYSTEM

DESCRIPTION:	This project will develop an analytical framework that can provide a means for assessing the safety impact of collision avoidance concepts and systems.
START DATE:	April 1994
END DATE:	April 1995
STATUS:	Statement of work is underway.
ESTIMATED TOTAL PROJECT COST:	$200,000
ANTICIPATED TOTAL FEDERAL SHARE:	$200,000
FEDERAL FUNDS THROUGH FY 93:	$0
CONTRACTOR:	University of Michigan Transportation Research Institute (UMTRI)
CONTACT:	Lloyd Emery, NHTSA Headquarters, NRD-51, (202) 366-5673

DIRECT PSYCHOPHYSIOLOGICAL MONITORING OF DRIVER ALERTNESS AND ATTENTION FOCUS

DESCRIPTION:	This project will develop and test a highly accurate device for direct psychophysiological monitoring of eye activity as an indicator of driver alertness and measure of driver attentional focus. Such a device could be employed as a stand-alone detection system or as a component of a more complex system that includes continuous measure of driver performance.
START DATE:	October 1993
END DATE:	October 1996
STATUS:	Phase I (Proof-of-Concept) in progress.
ESTIMATED TOTAL PROJECT COST:	To be determined.
ANTICIPATED TOTAL FEDERAL SHARE:	To be determined.
FEDERAL FUNDS THROUGH FY 93:	$146,000
CONTRACTOR:	Systems Technology, Inc.; MacLead Technologies, Inc.
CONTACT:	Ron Knipling, NHTSA HQ, NRD-53, (202) 366-4733

DRIVER STATUS/PERFORMANCE MONITORING

DESCRIPTION:	This project will lead to the development of vehicle-based countermeasures that will monitor driver status/performance, detect degraded performance, and provide a warning signal or other countermeasure to prevent its continuance. The current program will develop vehicle-based detection algorithms for reduced driver performance (e.g., symptomatic of drowsiness/fatigue).
START DATE:	September 1991
END DATE:	September 1997
STATUS:	Driving simulator data collection underway.
ESTIMATED TOTAL PROJECT COST:	$1,500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$1,500,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTRACTOR:	Virginia Polytechnic Institute (via Cooperative Agreement)
CONTACT:	Ron Knipling, NHTSA Headquarters, NRD-53, (202) 366-4733

DRIVER WORKLOAD ASSESSMENT

DESCRIPTION:	The purpose of this initiative is to (1) develop a capability to evaluate the effects of high-technology systems (e.g., crash avoidance systems, navigation systems) on driver safety performance; (2) develop standardized driver workload measurement protocols (including instrumentation), obtain baseline workload data, and evaluate high technology systems that are currently being implemented; and (3) identify aspects of system design and operation that can compromise safety, and obtain data relevant to human factors guidelines for the driver-vehicle interfaces of these systems.
START DATE:	July 1991
END DATE:	February 1995
STATUS:	Pilot testing of research methodologies completed.
ESTIMATED TOTAL PROJECT COST:	$954,000
ANTICIPATED TOTAL FEDERAL SHARE:	$954,000
FEDERAL FUNDS THROUGH FY 93:	$750,000
CONTRACTOR:	Battelle
CONTACT:	Michael Goodman, NHTSA Headquarters, NRD-52, (202) 366-5677

EVALUATION OF POTENTIAL HEALTH HAZARDS FROM WIDE-SPREAD USE OF ANTI-COLLISION TECHNOLOGIES

DESCRIPTION:	This project will conduct an evaluation of potential health hazards from wide-spread usage of anti-collision devices using IVHS technologies.
START DATE:	September 1993
END DATE:	March 1995
STATUS:	Literature search and modeling activity underway.
ESTIMATED TOTAL PROJECT COST:	$123,000
ANTICIPATED TOTAL FEDERAL SHARE:	$123,000
FEDERAL FUNDS THROUGH FY 93:	$100,000
CONTRACTOR:	Millitech Corporation
CONTACT:	Paul Spencer, NHTSA Headquarters, NRD-51, (202) 366-5668

HUMAN FACTORS DESIGN OF AUTOMATED HIGHWAY SYSTEMS

DESCRIPTION: Guidance on human factors issues is of critical importance to Automated Highway Systems (AHS) planners and designers. This research effort will provide timely human factors input during the conceptual stages of AHS development to aid in the design and implementation of the 1997 demonstration as well as to provide the foundation for the future advancement of AHS objectives.

This project includes both analytic and empirical tasks. In the early portion of the project, first generation AHS scenarios, including descriptions of AHS operations, objectives, and performance requirements, will be developed. These scenarios will be used as the basis for analytic and empirical research investigations addressing broad AHS human factors issues. In an iterative process, data from these efforts will be used to refine and revise the scenarios. The refined scenarios form the basis for a second set of empirical research investigations, addressing more detailed, system-specific AHS human factors issues. The culmination of these efforts will be an AHS Human Factors Handbook for AHS Designers and Driver-based AHS Human Factors System and Development Guidelines.

START DATE: October 1992

END DATE: March 1996

STATUS: AHS scenarios have been developed, operator functions have been defined, comparable systems analyses have begun, and the preliminary handbook is under development. Empirical research on the Iowa Driving Simulator to assess driver performance and maneuver capabilities has also been initiated.

ESTIMATED TOTAL PROJECT COST: $5,086,582

ANTICIPATED TOTAL FEDERAL SHARE: $5,086,582

FEDERAL FUNDS THROUGH FY 93: $5,086,582

CONTRACTOR: Honeywell, Inc.

CONTACT: Elizabeth Alicandri, FHWA R&D, HSR-10, (703) 285-2415

IN-VEHICLE CRASH AVOIDANCE WARNING SYSTEMS: HUMAN FACTORS CONSIDERATIONS

DESCRIPTION:	This project will identify driver requirements for effective warning system design and evaluate the potential of warning systems to help drivers avoid crashes.
START DATE:	September 1991
END DATE:	December 1996
STATUS:	Report on preliminary human factors guidelines and research needs is completed. Human factors studies of warning system parameters are being planned.
ESTIMATED TOTAL PROJECT COST:	$953,000
ANTICIPATED TOTAL FEDERAL SHARE:	$953,000
FEDERAL FUNDS THROUGH FY 93:	$330,000
CONTRACTOR:	Comsis
CONTACT:	Michael Perel, NHTSA Headquarters, NRD-52, (202) 366-5675

NATIONAL ADVANCED DRIVING SIMULATOR (NADS)

DESCRIPTION:	The objective of this NHTSA project is to develop a state-of-the-art driving simulator in the U.S. that will serve as a national research asset for use by scientists and engineers in both the public and private sectors. This driving simulator will enable researchers to conduct multi-disciplinary investigations and analyses on a wide range of issues associated with traffic safety, highway engineering, Intelligent Vehicle Highway Systems (IVHS), human factors, and motor vehicle product development.
START DATE:	January 1994
END DATE:	On-going
STATUS:	Phase I (Design Completion)
ESTIMATED TOTAL PROJECT COST:	$2,500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$2,500,000
FEDERAL FUNDS THROUGH FY 93:	$0
CONTRACTOR:	Contraves, Inc.; TRW, Inc.
CONTACT:	Keith Brewer, NHTSA Headquarters, NRD-51, (202) 366-5671

PATH

DESCRIPTION: The Partners for Advanced Transit and Highways (PATH) Program was established in 1986 by California Transportation (CalTrans) and the Institute of Transportation Studies (ITS) of the University of California at Berkeley. The PATH research is conducted across a large range of subject areas, including ATMS, Advanced Traveler Information Systems, AVCS, APTS, CVO, clean propulsion technology, human factors and safety system engineering, policy and planning, electronic toll collection, enabling technologies, and impacts/application studies. PATH differs from other IVHS programs in the considerable emphasis placed on clean propulsion technology and complete highway automation. Federal sponsorship of PATH research, begun in 1990, has focused primarily on AVCS activities.

START DATE: September 1992 (for current phase of research)

END DATE: September 1995

STATUS: In cooperation with CalTrans, FHWA is sponsoring research in fully automated highway systems, with emphasis on autonomous lateral and longitudinal vehicle control. Current activities are focused on the development of technology to support high-speed platooning, where packs of vehicles follow each other closely, using electronic sensing and communications, to increase highway capacity and safety. These efforts are focused on advancing the state of knowledge of the performance that is achievable in vehicle-follower longitudinal control. These efforts include characterization of the performance of vehicle-to-vehicle sensors, vehicle-to-vehicle communications systems, and braking actuation systems, as well as extensive on-road-testing.

ESTIMATED TOTAL PROJECT COST: $2,550,000 (for current phase of research)

ANTICIPATED TOTAL FEDERAL SHARE: $1,775,000 (for current phase of research)

FEDERAL FUNDS THROUGH FY 93: $1,775,000

PATH (cont.)

CONTRACTOR: California Department of Transportation (CalTrans), University of California at Berkeley

CONTACT: J. Richard Bishop, FHWA R&D, HSR-10, (703) 285-2680

PERFORMANCE SPECIFICATIONS: COUNTERMEASURES AGAINST INTERSECTION COLLISIONS

DESCRIPTION:	This project will lead to the development of performance requirements (both hardware and human factors) for advanced technologies to improve crash avoidance of vehicles negotiating intersections. This project will address autonomous vehicle-based systems, vehicle-vehicle communication systems, and/or cooperative highway-vehicle systems requiring instrumentation of intersections.
START DATE:	September 1993
END DATE:	September 1997
STATUS:	Phase I is currently in progress.
ESTIMATED TOTAL PROJECT COST:	$4,616,000
ANTICIPATED TOTAL FEDERAL SHARE:	$4,616,000
FEDERAL FUNDS THROUGH FY 93:	$837,000
CONTRACTOR:	Calspan Corporation
CONTACT:	Paul Spencer, NHTSA Headquarters, NRD-51, (202) 366-5668

PERFORMANCE SPECIFICATIONS: COUNTERMEASURES AGAINST LANE CHANGE, MERGING, AND BACKING COLLISIONS

DESCRIPTION:	This project will lead to the development of performance requirements (both hardware and human factors) for advanced technologies to improve crash avoidance during lane change, merging and backing maneuvers.
START DATE:	July 1993
END DATE:	July 1997
STATUS:	Phase I is currently in progress.
ESTIMATED TOTAL PROJECT COST:	$3,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$3,000,000
FEDERAL FUNDS THROUGH FY 93:	$1,200,000
CONTRACTOR:	TRW, Inc. (via inter-agency agreement with Air Force Logistics Command)
CONTACT:	Jose Bascunana, NHTSA Headquarters, NRD-51, (202) 366-5674

PERFORMANCE SPECIFICATIONS: COUNTERMEASURES AGAINST REAR-END COLLISIONS

DESCRIPTION:	This project will lead to the development of performance requirements (both hardware and human factors) for advanced technologies to prevent or decrease the severity of rear-end crashes.
START DATE:	May 1993
END DATE:	January 1997
STATUS:	Phase I is currently in progress.
ESTIMATED TOTAL PROJECT COST:	$4,354,705
ANTICIPATED TOTAL FEDERAL SHARE:	$4,354,705
FEDERAL FUNDS THROUGH FY 93:	$1,700,000
CONTRACTOR:	Frontier Engineering
CONTACT:	Art Carter, NHTSA Headquarters, NRD-51, (202) 366-5669

PERFORMANCE SPECIFICATIONS: COUNTERMEASURES AGAINST ROADWAY DEPARTURE COLLISIONS

DESCRIPTION:	This project will lead to the development of performance requirements (both hardware and human factors) for advanced technologies to improve crash avoidance during roadway departures ("ran-off-road"). This project is designed for countermeasure systems that will be self-contained within the vehicle. However, it does not exclude from consideration those countermeasure systems that may require, or that might be improved by, auxiliary equipment installed in the road or in other vehicles.
START DATE:	September 1993
END DATE:	July 1998
STATUS:	Phase I is currently underway.
ESTIMATED TOTAL PROJECT COST:	$4,400,000
ANTICIPATED TOTAL FEDERAL SHARE:	$4,400,000
FEDERAL FUNDS THROUGH FY 93:	$1,400,000
CONTRACTOR:	Carnegie Mellon University
CONTACT:	Lloyd Emery, NHTSA Headquarters, NRD-51, (202) 366-5673

PERFORMANCE SPECIFICATIONS: VISION ENHANCEMENT SYSTEMS FOR NIGHTTIME AND INCLEMENT WEATHER

DESCRIPTION:	This project will investigate the feasibility of equipping motor vehicles with vision enhancement systems to assist driver visibility during nighttime and inclement weather, and thus prevent related crashes.
START DATE:	January 1994
END DATE:	To be determined.
STATUS:	Assessment of the state-of-the-art.
ESTIMATED TOTAL PROJECT COST:	To be determined.
ANTICIPATED TOTAL FEDERAL SHARE:	To be determined.
FEDERAL FUNDS THROUGH FY 93:	$100,000
CONTRACTOR:	Carnegie Mellon University
CONTACT:	Jack Ference, NHTSA Headquarters, NRD-51, (202) 366-0618

PORTABLE DATA ACQUISITION SYSTEM FOR CRASH AVOIDANCE RESEARCH, PHASE I: SYSTEM DESIGN

DESCRIPTION:	The objectives of this project are to apply state-of-the-art technology and methods to develop an easily-installed, portable instrumentation package and a set of analytical methods/tools to allow driver-vehicle performance data to be collected using a variety of vehicle types. This project covers Phase I, which recommends system design and software specifications.
START DATE:	September 1992
END DATE:	May 1994
STATUS:	Final changes being done to specifications.
ESTIMATED TOTAL PROJECT COST:	$942,000
ANTICIPATED TOTAL FEDERAL SHARE:	$942,000
FEDERAL FUNDS THROUGH FY 93:	$596,000
CONTRACTOR:	Department of Energy (inter-agency agreement with Oak Ridge National Laboratory)
CONTACT:	Michael Goodman, NHTSA Headquarters, NRD-52, (202) 366-5677

PORTABLE DATA ACQUISITION SYSTEM FOR CRASH AVOIDANCE RESEARCH, PHASE II: SYSTEM PROTOTYPE DEVELOPMENT

DESCRIPTION:	The objectives of this project are to apply state-of-the-art technology and methods to develop an easily-installed, portable instrumentation package and a set of analytical methods/tools to allow driver-vehicle performance data to be collected using a variety of vehicle types. This project covers Phase II, which will include final design recommendations, cost estimates, and a working model of the system.
START DATE:	May 1994
END DATE:	January 1995
STATUS:	Will be initiated upon specifications.
ESTIMATED TOTAL PROJECT COST:	$419,000
ANTICIPATED TOTAL FEDERAL SHARE:	$419,000
FEDERAL FUNDS THROUGH FY 93:	$0
CONTRACTOR:	Department of Energy (inter-agency agreement with Oak Ridge National Laboratory)
CONTACT:	Michael Goodman, NHTSA Headquarters, NRD-52, (202) 366-5677

PROBLEM DEFINITION AND ANALYSIS OF TARGET CRASHES AND IVHS/COUNTERMEASURE ACTION

DESCRIPTION: This project has developed an analytical methodology for defining, analyzing, and modeling target crashes and IVHS/crash avoidance countermeasure action for the purpose of assessing potential effectiveness and identifying R&D needs. The methodology has been applied to several types of collision. These findings will help the U.S. DOT to prioritize and guide research and development on these countermeasures.

START DATE: August 1991

END DATE: On-going

STATUS: Draft reports for initial problem areas completed. Final reports under preparation.

ESTIMATED TOTAL PROJECT COST: $1,880,000

ANTICIPATED TOTAL FEDERAL SHARE: $1,880,000

FEDERAL FUNDS THROUGH FY 93: $1,280,000

CONTRACTOR: Inter-agency agreement with Volpe National Transportation Systems Center. Contractors: Battelle, Calspan, Castle Rock.

CONTACT: Ron Knipling, NHTSA Headquarters, NRD-53, (202) 366-4733

QUANTITATIVE CHARACTERIZATION OF VEHICLE MOTION ENVIRONMENT: SYSTEM APPLICATIONS

DESCRIPTION: This project will use the Vehicle Motion Environment (VME) measurement system to gather information on vehicle motion during normal driving conditions. It is expected that data will be collected at locations such as intersections, at points where queues form, on curves, and multi-lane traffic.

START DATE: December 1994

END DATE: To be determined.

STATUS: To be determined.

ESTIMATED TOTAL PROJECT COST: To be determined.

ANTICIPATED TOTAL FEDERAL SHARE: To be determined.

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Paul Spencer, NHTSA Headquarters, NRD-52, (202) 366-5668

QUANTITATIVE CHARACTERIZATION OF VEHICLE MOTION ENVIRONMENT: SYSTEM DESIGN

DESCRIPTION: This project will develop and validate a measurement system that can quantify the specific motions that vehicles exhibit as they move in traffic under the full array of traffic operations. In subsequent projects, the measurement system will be used to gather information such as reaction to other drivers cutting in front, normal following distance, typical lane change trajectories, and response to inclement weather. This information will provide the foundation for development of IVHS countermeasures that identify the need for intervention and/or collision avoidance instructions to the driver.

START DATE: September 1992

END DATE: December 1994

STATUS: Design phase completed; hardware integration underway.

ESTIMATED TOTAL PROJECT COST: $1,400,000

ANTICIPATED TOTAL FEDERAL SHARE: $1,400,000

FEDERAL FUNDS THROUGH FY 93: $1,400,000

CONTRACTOR: University of Michigan Transportation Research Institute (via Cooperative Agreement)

CONTACT: Paul Spencer, NHTSA Headquarters, NRD-51, (202) 366-5668

SAFETY ASSESSMENT OF THE PROTOTYPE AUTOMATED VEHICLE-HIGHWAY SYSTEM

DESCRIPTION:	Provide safety-related assessments and support of the legislatively established prototype Automated Vehicle-Highway System (AVHS) from conceptual development through operational test.
START DATE:	December 1994
END DATE:	To be determined.
STATUS:	Plans for initiation of the AVHS program are currently being formulated.
ESTIMATED TOTAL PROJECT COST:	To be determined.
ANTICIPATED TOTAL FEDERAL SHARE:	To be determined.
FEDERAL FUNDS THROUGH FY 93:	To be determined.
CONTRACTOR:	To be determined.
CONTACT:	August Burgett, NHTSA Headquarters, NRD-51, (202) 366-5672

STANDARDIZED DRIVING SIMULATION TASKS AND SCENARIOS

DESCRIPTION:	The objective of this NHTSA project is to specify and develop a set of driving tasks and scenarios that can be used as standard reference test conditions for assessments/evaluations of driver performance under a number of experimental conditions involving both normal driving and imminent crash threats. These tasks/scenarios/protocols will be derived from predominant driving patterns and crash types, and will be used in advanced driving simulators, including the National Advanced Driving Simulator.
START DATE:	September 1993
END DATE:	September 1995
STATUS:	Specifying two prototype standard scenarios.
ESTIMATED TOTAL PROJECT COST:	$400,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTRACTOR:	University of Iowa (via Cooperative Agreement)
CONTACT:	Ron Knipling, NHTSA Headquarters, NRD-53, (202) 366-4733

STUDIES OF INFRASTRUCTURE AND TRAFFIC IMPACTS OF ADVANCED VEHICLE CONTROL SYSTEM CONCEPTS

DESCRIPTION: Advanced Vehicle Control Systems (AVCS) performing such functions as run-off-the-road warning/avoidance, night vision enhancement, and intersection collision warning/avoidance are being studied by NHTSA/Office of Crash Avoidance Research. In addition to contracts directed at detection systems to reduce specific types of accidents, NHTSA has awarded several contracts in areas such as sensors, electronics/communications, and human factors to perform analysis and testing of enabling technologies for AVCS. This significant NHSTA effort is expected to raise numerous issues concerning infrastructure interactions with AVCS. In many cases, system concept feasibility will hinge upon the infrastructure element, such as in the case of "cooperative" roadside hardware markings. This study effort will address these issues, in close coordination with NHTSA.

A related area of emphasis of this effort will be to examine the traffic flow impacts of non-Automated Highway System (non-AHS) advanced vehicle control systems. Systems will be conceptualized and existing concepts derived from the NHTSA research will be evaluated on this basis.

START DATE: N/A

END DATE: N/A

STATUS: Contract award expected in spring 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: J. Richard Bishop, FHWA R&D, HSR-12, (703) 285-2680

TEST AND EVALUATION OF IVHS HARDWARE AND SYSTEMS

DESCRIPTION:	In conjunction with other on-going projects, this project will assess the performance of available IVHS devices/systems in support of the development of functional specifications of these devices/systems. The Vehicle Research and Test Center (VRTC) of NHTSA will work cooperatively with contractors in defining, performing, and analyzing the results from these tests.
START DATE:	September 1992
END DATE:	To be determined.
STATUS:	On-going
ESTIMATED TOTAL PROJECT COST:	To be determined.
ANTICIPATED TOTAL FEDERAL SHARE:	To be determined.
FEDERAL FUNDS THROUGH FY 93:	$550,000
CONTRACTOR:	NHTSA/VRTC
CONTACT:	August Burgett, NHTSA Headquarters, NRD-51, (202) 366-5672

VARIABLE DYNAMICS TEST VEHICLE

DESCRIPTION: The objective of this project is to determine if instrumented test bed vehicle(s) featuring adjustable ride and handling characteristics with capability for vehicle control through on-board and off-board computer/communication systems as well as instrumented measurement of driver and vehicle responses is a necessary addition to the IVHS program. This test bed will provide critical information on driver/vehicle interaction in support of automated highway and other IVHS programs, other crash countermeasure and human factors research, and the validation of the National Advanced Driving Simulator (NADS). A "needs" analysis and preliminary performance specifications are included in the final phase.

START DATE: September 1993

END DATE: To be determined.

STATUS: Phase I needs analysis.

ESTIMATED TOTAL PROJECT COST: To be determined.

ANTICIPATED TOTAL FEDERAL SHARE: To be determined.

FEDERAL FUNDS THROUGH FY 93: $359,000

CONTRACTOR: Jet Propulsion Laboratory (via inter-agency agreement with the National Aeronautics and Space Administration)

CONTACT: Lloyd Emery, NHTSA Headquarters, NRD-51, (202) 366-5673

Advanced Vehicle Safety Systems

(Operational Tests)

ROADWAY POWERED ELECTRIC VEHICLE (RPEV)

LOCATION: California

PARTNERS: FHWA, California Department of Transportation (CalTrans), Georgia Tech Research Institute, Ross Industries Inc., Raytheon, GE, Arthur D. Little, Inc.

START DATE: September 1992

END DATE: December 1994

DESCRIPTION: The RPEV provides for transmittal of electrical energy via an air path from devices in the roadway to electric vehicles. This was successfully accomplished (Phase I) via an inductive power transfer from a cable installed longitudinally in the pavement at Richmond Station in California.

Phase II will encompass advanced roadway development, five test vehicles, environmental studies, a second stage test facility, power supply and distribution system development, and economic feasibility and evaluation studies.

Phase III (1994-1995) will prototype the roadway design tested in Phase IIA, and then build enough powered roadway network on the site to demonstrate an internal distribution system. It will include additional test vehicles and an advanced power supply capable of powering a typical highway segment, a production version of which will be used in the system. It will continue the development and commercialization of automobile sized vehicles.

STATUS: Under design

ESTIMATED TOTAL PROJECT COST: $7,650,000 (Phase II)

ANTICIPATED TOTAL FEDERAL SHARE: $1,500,000 (Phase IIA)

FEDERAL FUNDS THROUGH FY 93: $1,500,000 (Phase IIA)

CONTACT: H. Milton Heywood, FHWA Headquarters, HTV-10, (202) 366-2182

PRIORITY CORRIDORS

IVHS PRIORITY CORRIDORS

DESCRIPTION: Within Part VI of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, Congress created the *IVHS Act of 1991*. The primary funding category of this Act, which provides over $500 million over the six-year ISTEA period, is the IVHS Corridors Program. The Act requires that at least one-half of the annual amount be spent for IVHS objectives within priority locations. The Secretary is to designate from 3 to 10 priority sites, which must meet specific criteria, the most limiting is for a location to have an extreme or severe ozone non-attainment rating.

FUNDING: For Priority Corridor funding, the legislative process provides a minimum of 50% of ISTEA corridor funding ($43M) each fiscal year. These funds will be available for both high-priority operational tests and implementation of advanced IVHS technologies, with an appropriate balance being maintained. The level of IVHS funding provided to each site will not be automatic but will be based on the site's IVHS Corridor Program Plan and the level of contribution to the national IVHS goals. To support all IVHS activities identified within the corridor sites, available IVHS funds have to be supplemented with other state/local/private and Federal-aid funding. The corridor locations are strongly encouraged to seek private sector participation.

CORRIDOR PROGRAM PLANS: Development of a complete "IVHS Corridor Program Plan" within each designated corridor site will be required as soon as possible. For each Priority Corridor, this IVHS Corridor Program Plan will outline a comprehensive vision for IVHS applications within the corridor, specifically addressing what IVHS elements will be showcased. Projects, schedules, priorities, and estimated funding needs will be identified. Each Program Plan will be closely coordinated with the national needs of the IVHS Program as defined in the USDOT IVHS Strategic Plan and the National IVHS Program Plan. DOT IVHS funding will be made available to support development and continuing implementation of the Corridor Program Plans, with a majority of Federal IVHS funding to be directed towards specific IVHS operational tests projects. USDOT agencies will work with the Priority Corridor locations to develop and approve projects on a case-by-case basis.

DESIGNATED AREAS: Only four areas meet all the Priority Corridor requirements, and these areas were designated as IVHS Priority Corridors in March 1993:

IVHS PRIORITY CORRIDORS (cont.)

The I-95 Northeast Corridor

A large section of I-95 from Maryland to Connecticut (limits set due to the air quality criteria contained in the ISTEA) has been designated. An "I-95 Northeast Coalition" made up of transportation agencies from Virginia to Maine is pursuing a coordinated IVHS program along the I-95 corridor. This unique combination of State, toll, transit, and other transportation agencies will enable the testing and evaluation of a wide number of IVHS services, especially projects dealing with multimodal intercity traveller information needs and jurisdictional coordination in the operation of a multi-state corridor.

With initial funding support of $515,000 of Federal IVHS funds, the Coalition has completed development of a "Business Plan" which outlines an IVHS vision and a program of projects. Funds identified in the FY 1993 Appropriations Bill ($10.5 million) are being used to initiate projects from the Business Plan including:

- Creation of an "Information Exchange Network" backbone for communications and coordination purposes throughout the Corridor, and to support future multi-jurisdictional IVHS-related functions.
- Development of incident management procedures and support infrastructure which addresses the needs of a multi-state, multi-entity coalition.
- Development of a coordinated approach to provide traveller information using existing and near-term resources within the Coalition.
- Continuing managerial, technical, and other support services for the Coalition, including initiation of a public/private outreach effort.
- Define surveillance requirements for the various user services / traffic management strategies being developed by individual agencies and Corridor-wide.
- Develop a program for commercial vehicle operations in the Corridor, building upon existing institutional studies and focussing on the travel information needs of the trucking industry.
- Identify the user needs of I-95 Corridor passengers and freight users/customers to better plan and prioritize Corridor programs

and determine the extent of commercial market exists for travel information.

- Begin Coalition efforts to make multimodal travel data easily available to users, including exploration of private sector/partnership opportunities.
- Focus on improved intermodal coordination and efficiency as well as outreach by the Coalition to involve the full array of transportation providers and users within the Corridor.

Various Coalition members are taking the lead to procure and administer these projects, including Delaware Department of Transportation, Virginia Department of Transportation, the Pennsylvania Turnpike Commission, and the Port Authority of New York/New Jersey.

Contacts are:

Michael Halladay, FHWA Headquarters (HTV-20), (202) 366-6503
Jonathan McDade, FHWA Region 1 (Albany, NY), (518) 472-4253, ext. 254
James Robinson, FHWA Region 3 (Baltimore, MD), (410) 962-3815

The Midwest Corridor

I-80/I-90/I-94 from Gary, IN through Chicago, IL to Milwaukee, WI. The corridor efforts will initially focus on dynamically interconnecting various toll and other independent systems, and expanding the content and area of coverage of the traveler information system currently operated by the Illinois DOT. Elements of the area's transit systems, commercial vehicle operations within the corridor, and the ADVANCE operational test are being included in the multi-state corridor plan.

A three-state coalition has been formed to oversee development of corridor program plan. An agreement has been signed by the Governors of all three states (Indiana, Illinois, Wisconsin). Funding support to date includes three amounts identified in the FY 1993 Appropriations Bill ($1.4 million for Gary, $500,000 for Chicago, and $500,000 for Milwaukee),

and $2.5 million indicated in the FY 1994 Appropriations Bill.

A portion of these amounts will be used to develop a corridor-wide plan for developing and implementing IVHS and improving transportation throughout the corridor. Responses to a request for proposals for consultant support to prepare this plan were received in early 1994, and work is expected to be underway by mid-1994.

Contacts are:

Bob Rupert, FHWA Headquarters (HTV-20), (202) 366-2194
Martin Monahan, FHWA Region 5 (Homewood, IL), (708) 206-3218

The Houston, TX Corridor

I-10/I-45 through Houston. Harris County, TxDOT, the City of Houston, and Houston METRO have formed a partnership to guide IVHS activities. These parties have been working together over a number of years to develop the Houston Intelligent Transportation System (HITS), which envisions a fully-developed transportation management system serving needs such as provision of traveller information, public transportation and ridesharing, and commercial vehicle-oriented elements. Early efforts have focussed on a comprehensive "Smart Commuter" project, and further opportunities utilizing Houston's extensive network of HOV lanes, park and ride lots, transit centers, and intermodal movements are envisioned.

Federal IVHS funds have been obligated to support development of a corridor program plan and to initiate several additional operational tests beyond the Smart Commuter project. $3.01 million in Federal IVHS funds were identified in the FY 1993 Appropriations Bill for these projects.

Contacts are:

Michael Halladay, FHWA Headquarters (HTV-20), (202) 366-6503
Greg Jones, FHWA Region 6 (Fort Worth, TX), (817) 334-4379

IVHS PRIORITY CORRIDORS (cont.)

The Southern California Corridor

I-5/I-10 from Los Angeles to San Diego. CalTrans will organize the IVHS program along with key city and county transportation agencies along the corridor. Southern California transportation officials have historically been leaders in advancing transportation management technologies and concepts. Advanced transportation management facilities are being installed in Los Angeles (SMART Corridor), in Anaheim and Irvine (Orange County), and in San Diego. One focus of these on-going projects is integration of the freeway incident detection and management systems with the arterial traffic signal control systems, and future activities include incorporating artificial intelligence into the control algorithms.

The California Department of Transportation (CalTrans) is developing a corridor management team, comprised of regional (district) transportation groups from Los Angeles, Orange County and San Diego.

The FY 1993 Appropriations Bill identified three separate amounts for this Priority Corridor; $4.9 million for Los Angeles, $4.2 million for Anaheim, and $2.1 million for San Diego. Most of these funds are to be used for five IVHS Operational Test projects announced in December 1992 (see descriptions elsewhere in this publication); the remaining earmarked funds are to be used to develop a corridor program plan.

Contacts are:

Bob Rupert, FHWA Headquarters (HTV-20), (202) 366-2194

Jeff Lindley, FHWA Region 9 (San Francisco, CA), (415) 744-2659

NATIONAL COMPATIBILITY PLANNING

NATIONAL COMPATIBILITY PLANNING

National compatibility will provide for interchangeable products and a full range of IVHS user services nationwide, while preserving the capability for future expansion and modernization. Planning and achieving an integrated, compatible national IVHS includes the development of an open, nationwide IVHS system architecture and the evolution and promulgation of IVHS standards that bring together user service needs. These efforts will enhance the market for IVHS products, and reduce the risk for product developers. An open architecture will foster interoperable products that will compete on their merits in terms of price and performance. IVHS customers, be they private sector entities, government agencies or individuals, will be able to choose from a variety of vendors. National compatibility planning will make IVHS products more readily available and help to nurture an IVHS product and service industry in the United States.

Activities to help ensure national compatibility of IVHS systems are described in this section.

COMMERCIAL VEHICLE SHORT RANGE COMMUNICATION

DESCRIPTION: This project will provide radio frequency communication support and evaluation of AVI for the commercial vehicle expert information system. FHWA is working in close partnership with the Lawrence Livermore National Laboratory and the National Institute of Standards and Technology. This partnership will evaluate and select a national standard for short range vehicle to roadside communication for commercial operations. This study will first determine the services to be provided by Automatic Vehicle Identification (AVI) and the requirements of a system to provide those services. Existing systems and standards will then be reviewed to determine how they meet these requirements. Based on this review, a proposed national standard will then be developed. Finally, a prototype system will be developed to demonstrate the feasibility of the proposed standard.

START DATE: July 1993

END DATE: July 1994

STATUS: A contract was finalized and work began in July 1993. Functional and technical communication requirements have been defined, and technical alternatives have been identified. The evaluation of communication alternatives is in progress, with the final joint recommendation scheduled for March 1994.

ESTIMATED TOTAL PROJECT COST: $646,464

ANTICIPATED TOTAL FEDERAL SHARE: $646,464

FEDERAL FUNDS THROUGH FY 93: $646,464

CONTRACTOR: Lawrence Livermore National Laboratory and the National Institute of Standards and Technology

CONTACT: Michael Curtis, FHWA R&D, HSR-10, (703) 285-2991

COMMERCIAL VEHICLE SYSTEM DESIGN

DESCRIPTION: The FHWA is currently designing, testing, and evaluating Intelligent Vehicle Highway System technology to provide automated clearance for interstate and intrastate Commercial Vehicle Operations (CVO). Currently, commercial vehicles are stopped at state borders and checked for credentials, weight and safety parameters. While these are necessary checks, they cost millions of dollars in lost productivity. An architecture for an expert information system that will allow commercial vehicles to be inspected as they pass at highway speeds is being designed. This will substantially increase productivity and customer satisfaction. This system will eliminate long lines and inspections of responsible carriers at weigh stations and will allow inspectors to focus on the very limited number of carriers who pose a high risk to public safety.

START DATE: January 1994

END DATE: January 1995

STATUS: A contract was finalized in December 1993 and work began in January 1994.

ESTIMATED TOTAL PROJECT COST: $1,010,000

ANTICIPATED TOTAL FEDERAL SHARE: $1,010,000

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: Johns Hopkins Applied Physics Laboratory

CONTACT: Michael Curtis, FHWA R&D, HSR-10, (703) 285-2991

DEVELOPMENT OF A NATIONAL AUTOMATIC VEHICLE IDENTIFICATION STANDARD

DESCRIPTION: This study will first determine the services to be provided by AVI and the requirements of a system to provide those services. Existing systems and standards will then be reviewed to determine how they meet these requirements. Based on this review a proposed national standard will then be developed. Finally, a prototype system will be developed to demonstrate the feasibility of the proposed standard.

START DATE: June 1, 1993

END DATE: December 31, 1993

STATUS: NIST has completed a draft technical requirements document and submitted it to FHWA for review. NIST has contacted numerous suppliers of short range VRC equipment, including Mark IV, Amtech, AT-Comm, TI, Hughes and others. They are evaluating the capability of each technology. They are evaluating type I, II, and III transmitters using active and backscatter technologies to determine which is best suited to meet the technical and operational requirements for a national preclearance system. We anticipate a final decision this fall.

ESTIMATED TOTAL PROJECT COST: $0

ANTICIPATED TOTAL FEDERAL SHARE: $

FEDERAL FUNDS THROUGH FY 93: $266,964

CONTRACTOR:

CONTACT: Michael Curtis, HSR-10, 703-285-2991

ELECTROMAGNETIC COMPATIBILITY TESTING FOR IVHS

DESCRIPTION:	A resource has been established to conduct evaluations of the electromagnetic compatibility of various proposed IVHS communications components, operating singly and in combination. Many of the issues to be investigated will be drawn from the IVHS System Architecture development effort. Sophisticated simulations, anechoic chambers, and antenna test ranges will be employed to perform this testing.
START DATE:	June 1993
END DATE:	June 1996
STATUS:	An inter-agency agreement has been negotiated with The Institute for Telecommunication Sciences, to perform this work.
ESTIMATED TOTAL PROJECT COST:	$1,350,000
ANTICIPATED TOTAL FEDERAL SHARE:	$1,350,000
FEDERAL FUNDS THROUGH FY 93:	$1,350,000
CONTRACTOR:	Institute for Telecommunication Sciences
CONTACT:	James Arnold, FHWA R&D, HSR-10, (703) 285-2974

GLOBAL POSITIONING SYSTEM (GPS) AUGMENTATION

DESCRIPTION: This effort is intended to develop a national approach to augmented GPS services. The augmentation being considered is one or more of a number of applications, such as wide area/local area differential GPS (WADGPS/LADGPS). It will encompass requirements from within the Department of Transportation, the Department of Defense, the National Oceanographic and Atmospheric Administration, other organizations within the Federal government, and civil users. Within this effort, the requirements and needs of each group will be analyzed, a survey of current and planned augmented GPS systems shall be conducted, and, after a cost analysis is completed, a final report recommending a GPS augmentation system will be generated.

START DATE: February 9, 1994

END DATE: September 30, 1994

STATUS: An inter-agency agreement has been negotiated with the Institute for Telecommunication Sciences, Boulder, Colorado, to perform this work.

ESTIMATED TOTAL PROJECT COST: $900,000

ANTICIPATED TOTAL FEDERAL SHARE: $900,000

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: Institute for Telecommunication Sciences of the National Telecommunications and Information Administration

CONTACT: James Arnold, FHWA R&D, HSR-10, (703) 285-2974

GLOBAL POSITIONING SYSTEMS

DESCRIPTION: The DOT's Research and Special Programs Administration (RSPA) is addressing IVHS issues, both suburban and rural, in relation to Global Positioning Systems (GPS) and the impact of the Federal Radionavigation Plan on implementing IVHS technologies. GPS is expected to be the radionavigation system of choice in IVHS vehicles. Specifically, differential GPS will be necessary to meet the stringent position accuracy requirements of IVHS if Department of Defense policy to degrade GPS position accuracy for non-military users continues. The RSPA is examining the requirements of IVHS for navigation and positioning to determining if differential services to be offered by Coast Guard, FAA, or any other Federal or non-Federal system meets these requirements and thereby avoids requiring FHWA to expend resources to establish their own network.

START DATE: May 1992

END DATE: September 1993

STATUS: The 1992 Federal Radionavigation Plan was broadened to incorporate IVHS. Volpe National Transportation Systems Center (VNTSC) is currently developing a matrix that will display intermodal GPS requirements, as well as communications and automatic surveillance requirements.

ESTIMATED TOTAL PROJECT COST: $250,000

ANTICIPATED TOTAL FEDERAL SHARE: $250,000

FEDERAL FUNDS THROUGH FY 93: $250,000

CONTRACTOR: Volpe National Transportation Systems Center (VNTSC)

CONTACT: Heywood Shirer, RSPA, DRT-20, (202) 366-4355

IVHS RADIO FREQUENCY SPECTRUM PLANNING

DESCRIPTION: This is an ongoing project to identify the emerging radio frequency needs of IVHS operational tests and eventual IVHS deployment, and to take the necessary steps to ensure that spectrum is available when needed. This involves establishing relationships with the two U.S. radio spectrum management agencies, the Federal Communications Commission (FCC), and the National Telecommunications and Information Administration (NTIA).

START DATE: December 1991

END DATE: On-going

STATUS: The Interdepartment Radio Advisory Committee (IRAC), an organization within the NTIA responsible for government spectrum, has allotted the FHWA five nationwide, narrowband frequency-pairs, in the 220-222 Mhz band, for experimental use in the IVHS program. The FHWA will maintain administrative control over the use of the frequencies, and intends to share their use with its partners in selected IVHS projects. The development of guidelines for use of these frequencies is available.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: The MITRE Corporation

CONTACT: Frank Mammano, FHWA R&D, HSR-10, (703) 285-2405

LINK IDENTIFICATION FORMAT AND MAP DATABASE REQUIREMENTS

DESCRIPTION: This study will work closely with national interests to examine various methods for identifying segments of transportation links and develop recommendations for standardizing the information format, content, and accuracy of a nation-wide map database that can be associated with multi-modal traveler information systems. A format for uniquely denoting links for any part of North America will be recommended, with efforts towards an international standard.

START DATE: July 1993

END DATE: July 1996

STATUS: An inter-agency agreement was negotiated with Oak Ridge National Laboratory in July 1993.

ESTIMATED TOTAL PROJECT COST: $1,600,000

ANTICIPATED TOTAL FEDERAL SHARE: $1,600,000

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: Oak Ridge National Laboratory (ORNL)

CONTACT: Mike Curtis, FHWA R&D, HSR-12, (703) 285-2991

SYSTEM ARCHITECTURE CONSENSUS BUILDING

DESCRIPTION: The contractor will work jointly with the USDOT in an aggressive program to build consensus on a national IVHS architecture. This effort will include arranging and facilitating a series of regional briefings to public and private sector organizations and consumer and interest groups about the progress of the IVHS architecture definition effort and the socioeconomic implications of these architectures, and provide a means for feeding input from these stakeholder organizations back into the IVHS architecture development process. The contractor and USDOT partnership form what is referred to as the Consensus Building Team.

Contractor services to be provided include: working with the USDOT and the IVHS architecture definition contractors to develop material that is appropriate for this outreach program; arranging and facilitating task force and focus group meetings to discuss IVHS architecture issues identified by the architecture development effort; providing logistical services, such as making arrangements for these meetings; and serving as a channel for feeding back stakeholder organizations' concerns into the IVHS architecture development process.

START DATE: October 1, 1992

END DATE: September 30, 1996

STATUS: Task has been incorporated as part of the IVHS AMERICA contract.

ESTIMATED TOTAL PROJECT COST: $2,000,000

ANTICIPATED TOTAL FEDERAL SHARE: $2,000,000

FEDERAL FUNDS THROUGH FY 93: $2,000,000

CONTRACTOR: IVHS AMERICA

CONTACT: Michael Schagrin, FHWA Headquarters, HTV-10, (202) 366-2180

SYSTEM ARCHITECTURE DEVELOPMENT

DESCRIPTION: Four industry teams have been contracted to develop candidate IVHS architectures. Each team will produce an open national IVHS system architecture that provides the full set of IVHS services (as defined in the IVHS National Program Plan) while meeting critical IVHS goals and objectives. The teams will produce a set of fully defined architectures in terms of information and data flows, based on a systematic analysis. The four architectures defined during the first phase of the program will be evaluated to determine which architectures are technically promising and will be subjected to a consensus program to obtain user/stakeholder satisfaction relative to the implications of deployment and use of IVHS systems designed in accordance with the proposed architectures.

The work of the teams is being managed by a DOT-led architecture review team. Regularly scheduled progress reviews and formal program reviews are being held to present and review products produced by the contract teams. Assisting in the technical review of products from the Architecture development effort is an independent Technical Review Team (TRT) of private sector representatives. Once this effort is complete a second phase of architecture refinement and further evaluation is planned to reduce the number of candidate architectures to those most promising. A national IVHS architecture will be selected at the end of the second phase in mid 1996.

START DATE: September 15, 1993

END DATE: July 1996

STATUS: Initial architecture products have been produced and are in the process of being reviewed by the DOT architecture review team. The consensus program is underway and plans to hold 10 region meetings have been finalized.

SYSTEM ARCHITECTURE DEVELOPMENT (cont.)

ESTIMATED TOTAL PROJECT COST:	$20,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$20,000,000
FEDERAL FUNDS THROUGH FY 93:	$3,951,100
CONTRACTORS:	1) Hughes Aircraft Company 2) Loral/IBM 3) Rockwell International Corporation 4) Westinghouse Electric Corporation
CONTACT:	Lee Simmons, FHWA Headquarters, HTV-10, (202) 366-8048

SYSTEM ARCHITECTURE MANAGER

DESCRIPTION: The Architecture Manager will work closely with the contract teams involved in the IVHS architecture development effort. The functions of the manager include supporting the efforts of these teams, providing technical review and advisory services related to their products, and participating in the evaluation of the candidate architectures produced by the teams. Also included in the terms of the agreement are provisions for contract management services, and the performance of various support studies, as needed.

START DATE: January 1993

END DATE: To be determined.

STATUS: An inter-agency agreement with the National Aeronautics and Space Administration (NASA) has been executed for IVHS system architecture support from the Jet Propulsion Laboratory (JPL).

ESTIMATED TOTAL PROJECT COST: $6,200,000

ANTICIPATED TOTAL FEDERAL SHARE: $6,200,000

FEDERAL FUNDS THROUGH FY 93: $1,900,000

CONTRACTOR: Jet Propulsion Laboratory

CONTACT: Michael Schagrin, FHWA Headquarters, HTV-10, (202) 366-2180

DEPLOYMENT

DEPLOYMENT

The ultimate success of IVHS will be measured by the deployment of IVHS user services, and numerous efforts are underway to provide support for IVHS deployment activities. Preparing for deployment at the local level must be a systematic process, and DOT is funding deployment planning studies to assist local agencies in identifying their specific needs, and in developing short and long term strategic plans for deployment of IVHS services to meet these needs. DOT's goal is for the 75 largest U.S. metropolitan areas and 30 of the major intercity corridors connecting these metropolitan areas to develop IVHS deployment plans by the end of 1997. Early IVHS deployment activities are described in this section.

ATLANTA, GEORGIA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:	This project will develop a regional Strategic Deployment Plan for implementation of IVHS technologies in the Atlanta metro area. The project will use the ongoing Atlanta Regional Advanced Traffic Management Systems (ATMS) project as a foundation and involve the Georgia Department of Transportation, City of Atlanta, Atlanta Regional Commission (ARC), and the Metro Atlanta Rapid Transit Authority (MARTA).
START DATE:	September 1994
END DATE:	September 1995
STATUS:	The Request for Proposal is under development.
ESTIMATED TOTAL PROJECT COST:	$562,500
ANTICIPATED TOTAL FEDERAL SHARE:	$450,000
FEDERAL FUNDS THROUGH FY 93:	$450,000
CONTACT:	Susan Mooney, FHWA Region 4, HES-04, (404) 347-4075

AUSTIN, TEXAS AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:	This project will address the following user services: PreTrip Travel Information, En-Route Driver Advisory (driver information & in-vehicle signing), Traveler Services Information, Route Guidance, Incident Management, Travel Demand Management, Traffic Control, Public Transportation Management, Emergency Notification and Personal Security, and Emergency Vehicle Management.
START DATE:	October 15, 1993
END DATE:	June 30, 1995
STATUS:	The study is just getting started.
ESTIMATED TOTAL PROJECT COST:	$500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTACT:	Greg Jones, FHWA Region 6, HNG-06, (817) 334-4379 Bubba Needham, Texas DOT, (512) 832-7053

BIRMINGHAM, ALABAMA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The Alabama Department of Transportation has selected the firm of Parsons, Brinkerhoff, Inc. to develop an IVHS/Congestion Management Program for the Birmingham Metropolitan area. The Consultant will work with a State selected Oversight Committee which will be composed of State, City, County, and possibly private sector personnel. The consultant will identify levels of congestion on freeways and other highways of national significance and recommend short-term and long-term measures and IVHS strategies to alleviate congestion. The program will describe the needs, the applicable IVHS user services, the functional requirements, the system architecture, implementation issues, the cost effectiveness, and the performance monitoring plan.

START DATE: February 1994

END DATE: February 1995

STATUS: The Early Development Grant Agreement is being executed by the State.

ESTIMATED TOTAL PROJECT COST: $500,000

ANTICIPATED TOTAL FEDERAL SHARE: $400,000

FEDERAL FUNDS THROUGH FY 93: $400,000

CONTRACTOR: Parsons Brinkerhoff, Inc.

CONTACT: Susan Mooney, FHWA Region 4, HES-04, (404) 347-4075

BOSTON, MASSACHUSETTS AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The Early Deployment study resulted in a two-phased conceptual IVHS plan for the Boston Metropolitan area for years 1995 and 2000. The 1995 plan is the short range plan consisting of the latest state of the practice technologies. The long range plan for the year 2000 includes advanced and promising technologies. The study also recommends organizational changes needed to manage the recommended IVHS program.

START DATE: December 24, 1992

END DATE: December 31, 1993

STATUS: The project is completed and the State has begun to implement the short range recommendations.

ESTIMATED TOTAL PROJECT COST: $450,000

ANTICIPATED TOTAL FEDERAL SHARE: $360,000

FEDERAL FUNDS THROUGH FY 93: $360,000

CONTACT: Jonathan McDade, FHWA Region 1, HPP-01, (518) 472-4253
Edward Silva, FHWA, Massachusetts Division, (617) 494-2253
Daniel Beagan, Massachusetts DOT, (617) 973-7313

BUFFALO / NIAGARA FALLS, NEW YORK AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:

The area's IVHS coordinated deployment plan consists of three integrated phases. During Phase One (Early Deployment) NYDOT will pursue a consultant study to develop a strategic plan for area-wide deployment of IVHS. The study will follow the FHWA's User Services/IVHS Planning and Deployment Process. Key elements of the study will be:

* Establish the Coalition of Key Stakeholders;
* Develop an Area-wide Strategic Plan based on the Area's Unique User Service Needs;
* Identify Key Early Implementation Projects;
* Develop a Phase Implementation Plan with Timetable and Funding Availability;
* Identify/Qualify Operations and Maintenance Resource Needs;
* Identify Needed Institutional Arrangements;
* Establish Public Outreach Programs.

In order to keep the IVHS design/deployment process moving as efficiently as possible, the consultant study contract will be established with a mechanism to proceed directly into project design(s) (Phase Two).

Planning for Phase Two (May 1995 to March 1998) the consultant will perform preliminary engineering/design functions related to the implementation of early action projects, as well as p.e./design of the longer term comprehensive Advanced Traffic Management Systems (ATMS) elements. Also, this phase will include the implementation of early action projects.

It is anticipated that after April 1998, Phase Three will construct/implement the longer term comprehensive ATMS elements which will supplement the early action projects and establish a comprehensive system.

START DATE: November 1994

END DATE: October 1995

STATUS: Engaging a Consultant for Phase One (Deployment Planning).

BUFFALO / NIAGARA FALLS, NEW YORK AREAWIDE EARLY DEPLOYMENT PLANNING STUDY (cont.)

ESTIMATED TOTAL PROJECT COST:	$500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTACT:	Mark Bartlett, FHWA, New York Division, (518) 472-4131 Paul Cuerdon, New York Department of Transportation, (518) 457-7436

CHARLESTON, SOUTH CAROLINA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The Early Deployment funds are being used to perform a traffic study and prepare specifications and plans for implementing new technologies to manage and reduce congestion in Charleston, South Carolina. There are five project tasks.

Task 1: Identify routes and sources of potential congestion.

Task 2: Identify and recommend traffic operations systems techniques which may be used to detect and monitor traffic conditions.

Task 3: Recommend traffic operations system and management techniques which may be utilized to mitigate congestion.

Task 4: Recommend the method of monitoring, the physical facilities, the location of this control, and the equipment and staffing requirements.

Task 5: Prepare plans, specifications and estimates to procure and construct those devices, techniques, methods or processes.

START DATE: March 1993

END DATE: March 1995

STATUS: Post, Buckley, Schuh & Jernigan has been selected as the consultant. Task 1 is complete.

ESTIMATED TOTAL PROJECT COST: $400,000

ANTICIPATED TOTAL FEDERAL SHARE: $320,000

FEDERAL FUNDS THROUGH FY 93: $320,000

CONTACT: Patrick Kennedy, FHWA SC Division, HA-SC, (803) 253-3890
Susan Mooney, FHWA Region 4, HES-04, (404) 347-4075

CHARLOTTE, NORTH CAROLINA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The overall project for the Charlotte metropolitan area, titled "Congestion Avoidance and Reduction for Autos and Trucks", or CARAT, will incorporate elements of Advanced Traffic Management Systems, Advanced Traveler Information Systems and Commercial Vehicle Operations for the greater Charlotte/Mecklenberg area. The project is to be implemented in phases. The phase I initiative consists of the development and operation of a freeway management system for a 15.2 mile section of I-77. Future phases of the project will extend surveillance and control to a total of 360 miles of freeways in the Charlotte urban area.

The Early Deployment Planning study focused primarily on development of the functional specifications for the regional traffic management system.

The full project report describes the fundamental system elements necessary to implement this regional traffic management system in the greater Charlotte area. Analyses of the alternative technologies and strategies are presented as a basis for the recommendations. Where appropriate, functional specifications are included for use in the preparation of final design documents.

START DATE: June 1992

END DATE: December 1993

STATUS: The project study is complete.

ESTIMATED TOTAL PROJECT COST: $1,112,500

ANTICIPATED TOTAL FEDERAL SHARE: $400,000

FEDERAL FUNDS THROUGH FY 93: $400,000

CONTACT: Susan Mooney, FHWA Region 4, Georgia, HES-04, (404) 347-4075

CLEVELAND, OHIO AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The proposed project is for the development of a traffic surveillance and control system feasibility study for the Cleveland metropolitan area. The consultant will prepare a Strategic Deployment plan focusing on the freeway/expressway/major arterial system and an Incident Management Plan. The plan will identify the user service requirements in the study region, the user service objectives based on these requirements, the functions required to support the user services, and will define the system architecture.

START DATE: July 1994

END DATE: July 1995

STATUS: As of February, 1994, the State is preparing the RFP for consultant proposals.

ESTIMATED TOTAL PROJECT COST: $500,000

ANTICIPATED TOTAL FEDERAL SHARE: $400,000

FEDERAL FUNDS THROUGH FY 93: $400,000

CONTACT: Dale Schiavoni, Transportation Planning Engineer, Ohio Department of Transportation, District 12, (216) 581-2100

DALLAS, TEXAS AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:

The purpose of the Dallas area-wide IVHS plan is to improve mobility, safety, and productivity. The goals of the plan are:

* Coordinate with public and private sectors to collect and disseminate real-time information on traffic and transit conditions.
* Optimize transportation system operations by coordinating operations among governmental agencies.
* Encourage transit and High Occupancy Vehicle usage.

These goals will be addressed through six objectives with specific tasks associated with each objective.

1. Establish a broadly-based Steering Committee with representatives from multiple agencies.
2. Assess the existing transportation management and communications linkages and investigate the potential application of IVHS technologies.
3. Identify institutional and legal barriers to coordination and recommend solutions.
4. Produce an integrated, area-wide multimodal, multi-jurisdictional IVHS plan while maintaining flexibility to incorporate emerging technologies.
5. Develop project evaluation criteria, costs and benefits, priorities, and staged implementation plan.
6. Define projects for implementation, prepare proposals, and identify private and public funding sources.

START DATE: October 1992

END DATE: December 1994

STATUS: To date there has been a tremendous amount of multi-jurisdictional coordination. This has taken somewhat longer than originally anticipated but the plan will benefit in the long run. Two reports, Inventory of Existing and Planned Signal Systems, and Summary of Existing Incident Management Systems have been written.

DALLAS, TEXAS AREAWIDE
EARLY DEPLOYMENT PLANNING STUDY (cont.)

ESTIMATED TOTAL PROJECT COST:	$750,000
ANTICIPATED TOTAL FEDERAL SHARE:	$600,000
FEDERAL FUNDS THROUGH FY 93:	$600,000
CONTACT:	Greg Jones, FHWA Region 6, Texas, HEO-06, (817) 334-4379

DENVER, COLORADO AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: This Early Deployment Planning Project developed an Intelligent Vehicle/Highway System Strategic Plan for the Denver Metropolitan Area. The plan, covering the next 10 years, selects the first smart corridor and provides a guide for the implementation and deployment of IVHS technologies in this corridor, as well as throughout the metro area.

START DATE: December 1991

END DATE: April 1993

STATUS: A detailed IVHS technology review has been completed and five reports have been issued as follows:

1. Strategic Plan - October 1992
2. Early Action Plan - November 1992
3. Traffic Operations Center - June 1993
4. Master Plan - November 1993
5. Communications Network Plan - December 1993

ESTIMATED TOTAL PROJECT COST: $316,000

ANTICIPATED TOTAL FEDERAL SHARE: $213,000

FEDERAL FUNDS THROUGH FY 93: $213,000

CONTACT: C. P. Damon, FHWA Region 8, HPD-08, (303) 969-6712

DENVER, COLORADO PRELIMINARY ENGINEERING EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The Colorado DOT has developed an Intelligent Vehicle/Highway System Strategic Plan for the Denver Metropolitan Area. The plan provides a guideline for the implementation of IVHS technologies during the next 10 years. One of the first recommendations was to provide a Traffic Operations Center (TOC) as the focal point for multi-agency and public/private sector traffic management and IVHS activities. This deployment project is to develop the final design (PS&E) package for the TOC and the field elements that are needed to support the TOC.

START DATE: September 1992

END DATE: December 1994

STATUS: Site selection for the Traffic Operations Center has been completed. The consultant has not yet been given a work order to proceed with the design.

ESTIMATED TOTAL PROJECT COST: $625,000

ANTICIPATED TOTAL FEDERAL SHARE: $500,000

FEDERAL FUNDS THROUGH FY 93: $500,000

CONTACT: C. P. Damon, FHWA Region 8, HPD-08, (303) 969-6712
Larry Corcoran, CDOT, IVHS Operations, (303) 757-5159

DETROIT, MICHIGAN AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The Michigan Department of Transportation has retained the services of a consultant to assist with the preparation of a comprehensive deployment plan addressing the issues related to an upgrade and expansion of the existing 32.5 mile Advanced Traffic Management Systems (ATMS)/Advanced Traveler Information Systems (ATIS) (freeway surveillance) system in the Southeast Michigan - Metropolitan Detroit Area. The existing system was installed in 1980-81 and is a direct descendant of the John Lodge Freeway Surveillance project of the late 1960's. The state's existing five year action plan calls for extending ATMS/ATIS coverage over a system encompassing some 250 miles. Staging, costs and all technical aspects of this plan will be reexamined and refined in the context of evolving IVHS technologies. The study will review traffic data, determine the area's functional requirements for ATMS/ATIS services, identify and analyze alternative ATMS/ATIS technologies, and present a staged plan of recommended actions. The study will also develop a model approach to the development and deployment of alternative routings and traffic management plans for handling incidents.

START DATE: September 1992

END DATE: March 1994

STATUS: The consultant team has brought a number of new ATMS/ATIS ideas/recommendations to the State and Project Advisory Committee. Enhanced multi-agency communication/coordination of plans is occurring. Early implementation or "Quick Step" project recommendations have been developed and presented to Michigan DOT and the Project Advisory Committee. As result of the Early Deployment Study deliberations, an enhanced integration of two existing IVHS projects, DIRECT & FAST-TRAC, is being put into place. Both have features that have been included in the area's approved Transportation Improvement Program for the utilization of CMAQ funding.

DETROIT, MICHIGAN AREAWIDE EARLY DEPLOYMENT PLANNING STUDY (cont.)

ESTIMATED TOTAL PROJECT COST:	$500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTACT:	Morris Hoevel, FHWA Michigan Division, HTS-MI, (517) 377-1880

GREENSBORO, NORTH CAROLINA CORRIDOR EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: Through the "Incident Management Program for Active Control of Traffic", or IMPACT, the North Carolina Department of Transportation (NCDOT) is addressing the needs of small to medium-sized urban areas that are experiencing congestion. The IMPACT project encompasses the Greensboro, Winston-Salem, High Point area and focuses on the east-west interstate corridor, I-40/I-85, through the central region of North Carolina. The project will identify and evaluate the technologies applicable to a corridor-based Advanced Traffic Management System.

The Statewide Planning Branch of the NCDOT has begun to develop an IVHS Area Wide Plan for the region. Priority IVHS initiatives for the area have been developed jointly by the NCDOT Congestion Management Steering Committee, and the High Point, Greensboro, and Winston-Salem Technical Coordinating Committee. These priority groupings will form the basis for the study's focus, findings and recommendations for future IVHS project phasing.

START DATE: June 1992

END DATE: June 1994

STATUS: While the overall project is somewhat behind schedule; communication and coordination activities between the various participating localities are progressing well.

ESTIMATED TOTAL PROJECT COST: $187,500

ANTICIPATED TOTAL FEDERAL SHARE: $150,000

FEDERAL FUNDS THROUGH FY 93: $150,000

CONTACT: Susan Mooney, FHWA Region 4, HES-04, (404) 347-4075

GREENVILLE, SOUTH CAROLINA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:

The proposed congestion management plan consists of two phases. Phase I includes:

- Inventory and Data Collection
- Alternate Routes and Strategies
- Conceptual Advanced Traffic Management Systems (ATMS) Development
- Evaluation of Driver Information Systems
- ATMS Organization Development
- Legislation and Regulation Review
- Preliminary Study Report Preparation

Phase II will include the preparation of conceptual designs as a result of the steering committee recommendations and the preparation of the final study report.

START DATE: March 1993

END DATE: December 1994

STATUS: Wilbur Smith & Associates has been selected to perform the study. Phase I is underway.

ESTIMATED TOTAL PROJECT COST: $250,000

ANTICIPATED TOTAL FEDERAL SHARE: $200,000

FEDERAL FUNDS THROUGH FY 93: $200,000

CONTACT: Patrick Kennedy, FHWA South Carolina Division, HA-SC, (803) 253-3890
Susan Mooney, FHWA Region 4, HES-04, (404) 347-4075

HAMPTON ROADS, VIRGINIA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: Virginia DOT and those cities and countries which make up the Hampton Roads/Tidewater area (known as the IVHS Planning Committee) will use Early Deployment program funds to investigate the potential for bringing advanced technologies to the transportation system along the Virginia eastern shore. The envisioned outcome will be an area-wide plan for utilizing existing and advanced technologies that integrates transportation management systems (traffic, transit, etc.) of the State and individual cities. This study will also include an evaluation of FHWA's IVHS Planning and Project Deployment Process, which is a needs-based analysis of IVHS technology applications and is intended to be a model for future Early Deployment studies.

START DATE: September 1992

END DATE: Early 1995

STATUS: Consultant contract awarded February, 1994.

ESTIMATED TOTAL PROJECT COST: $586,000

ANTICIPATED TOTAL FEDERAL SHARE: $486,000

FEDERAL FUNDS THROUGH FY 93: $486,000

CONTACT: Bob Thomas, FHWA, Virginia Division, (804) 924-2567
Stephany Hanshaw, Virginia DOT, Region 3, (804) 924-2567

I-70 DENVER, COLORADO CORRIDOR EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The Colorado DOT proposes to focus on the application of IVHS technology in the I-70 corridor west of Denver. The corridor is seen as having high potential for developing the rural application of IVHS technologies with heavy emphasis on Advanced Traffic Management Systems (ATMS) and Advanced Traveler Information Systems (ATIS). This project will focus on developing a comprehensive implementation program of IVHS technologies aimed at a multi-phase effort which clearly identifies the most feasible options, gains public support, and the enlists cooperation of private sector interests. The project has three phases. This effort includes phase one only, in which a consultant will identify and evaluate applicable IVHS technologies, identify early action items, prepare a corridor master plan, assist in educational efforts and prepare reports on the project.

START DATE: July 1993

END DATE: December 1994

STATUS: This project was awarded to a team handed by Parsons De Leuw, Inc. in July 1993. Work began in September 1993. To date, a series of meetings has been held along the cooridor with various official public agencies to both advise them concerning this undertaking and obtain input as to their desires, concerns and expectations. An additional series of meetings for the public is scheduled for the near future. The contract is utilizing a steering committee of persons with various backgrounds to provide guidance and direction throughout the study.

ESTIMATED TOTAL PROJECT COST: $210,000

ANTICIPATED TOTAL FEDERAL SHARE: $168,000

FEDERAL FUNDS THROUGH FY 93: $168,000

CONTACT: C. P. Damon, FHWA Region 8, HPP-08, (303) 969-6712
John Kiljan, CDOT IVHS/New Technologies Group, (303) 757-9506

KANSAS CITY, MISSOURI-KANSAS AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The general objective of this study is to develop a master plan for implementing IVHS user services for transportation management. The plan is to be based on IVHS user services that can successfully address the needs of the bi-state Kansas City transportation system. A consultant will be employed to conduct the study. The consultant is to evaluate congestion in the area and recommend strategies which include, but are not limited to, the Incident Management and Traffic Control user services.

START YEAR: 1994

ENDING YEAR: 1995 (approximate)

STATUS: An RFP is currently being developed and consultant selection is expected to be completed by May 15, 1994.

ESTIMATED TOTAL PROJECT COST: $500,000

ANTICIPATED TOTAL FEDERAL SHARE: $400,000

FEDERAL FUNDS THROUGH FY 93: $400,000

CONTACTS:
Bob Alva, FHWA Kansas Division, HPG-KS, (913) 267-7281
Tony Wall, FHWA Missouri Division, HOP-MO, (314) 636-7104
Edward Halter, KDOT, (913) 677-5963
Dale Ricks, MHTD, (314) 751-1097

LAS VEGAS, NEVADA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:	This study will result in a Strategic IVHS Deployment Plan for the Las Vegas metropolitan area. The full range of IVHS user services will be considered in the development of this plan.
START DATE:	September 1993
END DATE:	December 1995
STATUS:	Development of the scope of work is underway.
ESTIMATED TOTAL PROJECT COST:	$500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTACT:	Jackie Landsman, FHWA Region 9, HPD-09, (415) 744-3103 Greg Novak, FHWA Nevada Division Office, HPR-NV, (702) 455-4481

LOS ANGELES / SAN DIEGO, CALIFORNIA CORRIDOR EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: This study will examine the current and proposed uses of IVHS technology in the San Diego - Los Angeles IVHS priority corridor. The study will be multimodal in nature and will include all major facilities and all categories of IVHS technology. The primary product of this study will be a master plan to coordinate the deployment of IVHS technology in the corridor and in the major metropolitan areas along the corridor (San Diego, Orange County, San Bernadino/ Riverside, Los Angeles)

START DATE: 1994

END DATE: 1996

STATUS: Request For Proposals (RFP's) for various elements of this study are currently being prepared.

ESTIMATED TOTAL PROJECT COST: $2,312,500

ANTICIPATED TOTAL FEDERAL SHARE: $150,000

FEDERAL FUNDS THROUGH FY 93: $150,000

CONTACT: Jeff Lindley, FHWA Region 9, (415) 744-2659
Frank Cechini, FHWA California Division, (916) 551-1079
Kay Hanson, California Department of Transportation, (916) 654-9853

LOUISVILLE, KENTUCKY AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: This planning study intends to develop a regional Advanced Traffic Management Systems (ATMS) plan for metropolitan Louisville, Kentucky. A consultant will perform the necessary studies for development of the early implementation plan. The tasks include:

1. Inventory the existing system and collect data including traffic volumes, speeds, and delays.

2. Develop management strategies and alternative routing plans for incidents. Elements to be considered include detection, communication systems, close circuit TV, changeable message signs, highway advisory radio, and a centralized traffic control center. The end product will be the Traffic Management Plan, the recommended system modifications required to implement the plan, and the estimated cost of implementing each recommended element.

3. Develop and optimize traffic signal timing plans on selected arterials in Louisville.

START DATE: June 1992

END DATE: June 1994

STATUS: A consultant has been selected and work is underway on the data collection and development of preliminary plans.

ESTIMATED TOTAL PROJECT COST: $512,500

ANTICIPATED TOTAL FEDERAL SHARE: $410,000

FEDERAL FUNDS THROUGH FY 93: $410,000

CONTACT: Bill Seymour, District 5, Kentucky Transportation Cabinet, (502) 367-6411
Susan Mooney, FHWA Region 4, HES-04, (404) 347-4075

NEW ORLEANS, LOUISIANA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:	The Louisiana Department of Transportation and Development (LDOTD) and the Regional Planning Commission (RPC) of the New Orleans metropolitan area will develop an Intelligent Vehicle Highway System Strategic Plan for the New Orleans metropolitan area. The plan will consider both short and long range objectives for the implementation and deployment of IVHS technologies throughout the metropolitan area.
START DATE:	September 1993
END DATE:	October 1995
STATUS:	As of February 1994, the LDOTD and the New Orleans RPC have begun the RFP process for selection of a consultant.
ESTIMATED TOTAL PROJECT COST:	$500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTACT:	Greg Jones, FHWA Region 6, Texas, HNG-06, (817) 334-4379

NORTHERN VIRGINIA / WASHINGTON, D.C. AREA EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The primary objective of this study is to develop a long-range, comprehensive plan of an Advanced Traffic Management Systems (ATMS) in the Northern Virginia region of the Washington, D.C. metropolitan area. The study will analyze and assess current and planned extensions of traffic management capabilities in the region, define an expandable and adaptable systems architecture, identify supporting advanced technologies, and develop an implementation plan to guide ATMS deployment. This study will be coordinated with other future Early Deployment initiatives in the Washington, D.C. area.

START DATE: September 1993

END DATE: September 1995

STATUS: An IVHS Partnership Agreement has been executed for the Northern Virginia study. Project start-up is anticipated in early to mid 1994.

ESTIMATED TOTAL PROJECT COST: $500,000

ANTICIPATED TOTAL FEDERAL SHARE: $400,000

FEDERAL FUNDS THROUGH FY 93: $200,000

CONTACT: Bob Thomas, FHWA, VA Division, (804) 771-2389
Charles Hall, Project Manager, Virginia DOT Traffic Division, (804) 786-6777

OMAHA, NEBRASKA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:	The objective of this study is to develop a long-range, comprehensive plan for development and implementation of IVHS user services in the Omaha-Council Bluffs metropolitan area. This study, to be conducted by the University of Nebraska at Lincoln (UNL), will result in a plan which will provide a "road map" for incorporating IVHS into the area's long range transportation plan and transportation improvement program
START YEAR:	1994
ENDING YEAR:	1995 (approximate)
STATUS:	UNL is in the advanced stage of proposal development and its final proposal is anticipated to be submitted by March 30, 1994.
ESTIMATED TOTAL PROJECT COST:	$500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTACTS:	Milo Cress, FHWA Nebraska Division, HBR-NE, (402) 437-5521

ORANGE COUNTY, CALIFORNIA
EARLY DEPLOYMENT PLANNING PROJECT

DESCRIPTION:	This project will develop a Preliminary Design Report which will identify the functional requirements, area of coverage, hardware and software requirements, costs, estimated benefits, and project phasing for Phase I of a county-wide Advanced Traveler Information System. Plans, specifications, and estimates will be developed for the field installation and the system hardware and software components.
START DATE:	September 1993
END DATE:	Late 1994
STATUS:	A detailed statement of work for this project is currently being prepared.
ESTIMATED TOTAL PROJECT COST:	$562,500
ANTICIPATED TOTAL FEDERAL SHARE:	$450,000
FEDERAL FUNDS THROUGH FY 93:	$450,000
CONTACT:	Jeff Lindley, FHWA Region 9, HPD-09, (415) 744-2659 Frank Cechini, FHWA California Division, HEO-CA, (916) 551-1079 Dean Delgado, Orange County Transportation Authority, (714) 560-6282

PENNSYLVANIA TURNPIKE CORRIDOR EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The Pennsylvania Turnpike Authority will conduct an IVHS Early Deployment corridor study consisting of a needs-based approach examining the possible applications of advanced technologies to existing and future traffic and incident management programs. A Strategic Plan will be developed for IVHS deployment on the Pennsylvania Turnpike in the Greater Philadelphia to Greater Pittsburgh corridor.

START DATE: January 1994

END DATE: January 1996

STATUS: A grant agreement between PADOT and FHWA was executed in September, 1993. Study will be initiated in early 1994.

ESTIMATED TOTAL PROJECT COST: $375,000

ANTICIPATED TOTAL FEDERAL SHARE: $300,000

FEDERAL FUNDS THROUGH FY 93: N/A

CONTACT: Jim Robinson, FHWA Region 3, (410) 962-3815
Elizabeth Voras, Pennsylvania Turnpike Commission, (717) 986-9601

PITTSBURGH, PENNSYLVANIA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: Pennsylvania DOT through this deployment planning study has developed strategic plans for the Pittsburgh area freeway management system. The system, which will mainly cover I-276/376, will tentatively include closed circuit television, parkway advisory radio, ramp metering, surveillance and control system, changeable message signs (CMS), and an operations center. This Freeway Management System will interface with other existing and planned systems (i.e., existing high occupancy vehicle (HOV) lanes, changeable message signs, a planned telephone advisory system, and the planned City of Pittsburgh computerized traffic signal system).

START DATE: September 1992

END DATE: Completed.

STATUS: The final preliminary engineering has been completed.

ESTIMATED TOTAL PROJECT COST: $500,000

ANTICIPATED TOTAL FEDERAL SHARE: $400,000

FEDERAL FUNDS THROUGH FY 93: $400,000

CONTACT: Jose Ramirez, FHWA, PA Division, HDV-PA, (717) 782-3940
Thomas Fox, PADOT, (412) 429-4975

PORTLAND, OREGON AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: Three draft source books have been prepared, including 1) "Signal Systems and Detections", 2) "Corridor Assessments", and 3) "Incident Management - Background Paper". The Signal Systems and Detection source book summarizes the results of a survey of the traffic signals on the major routes in the Portland region. This document contains information on operating agency, ownership, maintenance responsibilities, interconnections, coordination, controller types, and software types. The draft of the Corridor Assessments source book identifies traffic volumes and accident records for the major corridors in the region. Ultimately this document will include descriptions of the corridors, congestion locations during peak hours, accident "hot spot" locations, speed surveys, and corridor evaluations for existing and future conditions including problem area summaries with relationships to an Advanced Traffic Management System (ATMS) plan. The Incident Management source book contains information on existing incident management activities in the Portland area, a framework for communication, and elements of an incident management traffic control plan. Other source books that will be completed with this project include an ATMS Primer, which will be the basis of the ATMS plan for the region, and an Institutional Framework, which will address inter-agency and other institutional issues.

START DATE: June 1992

END DATE: Early 1994

STATUS: DKS and Associates, the contractor, has completed their efforts in this study. The final technical reports and executive summary have been delivered to Oregon Department of Transportation (ODOT). The plan developed by this effort is an austere six-year plan for implementation of an ATMS in the Portland-Vancouver area. The estimated total capital cost for the six-year implementation is approximately $25 million. Detection will include closed circuit television, dedicated cellular service and detectors primarily at ramp meter locations. The traffic operations center (TOC) will utilize existing space owned by ODOT and remodeled to accommodate TOC equipment and personnel. Recommendations were made regarding institutional arrangements that would accommodate implementation of ATMS and incident management programs in the area.

PORTLAND, OREGON AREAWIDE
EARLY DEPLOYMENT PLANNING STUDY (cont.)

ESTIMATED TOTAL PROJECT COST:	$500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTACT:	Ed Fischer, FHWA Region 10, HEO-10, (503) 326-2071 Gary McNeel, Oregon DOT, (503) 731-8208

PROVIDENCE, RHODE ISLAND AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: This project will create a plan which will direct the implementation and operation of IVHS in the State of Rhode Island based on the specific needs and resources of the State. The study will use the IVHS Planning and Project Deployment Process. Rhode Island will pursue IVHS and their Congestion Management System planning concurrently and will develop and utilize a common baseline data, performance standards, and goals.

START DATE: Fall 1994

END DATE: Fall 1995

STATUS: The study has been approved and the Grant Agreement is ready for signature.

ESTIMATED TOTAL PROJECT COST: $500,000

ANTICIPATED TOTAL FEDERAL SHARE: $400,000

FEDERAL FUNDS THROUGH FY 93: $400,000

CONTACT: Jonathan McDade, FHWA Region 1, HPP-01, (518) 472-4253
Rick Backlund, HPR-RI, (401) 528-4548

RALEIGH / DURHAM / CHAPEL HILL, NORTH CAROLINA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: This project is an areawide study of potential IVHS deployment activities in the Raleigh/Durham/Chapel Hill area. A twelve county study area has been identified; however, the primary focus of the report will be the most urbanized counties including Durham, Orange, and Wake. Through a cooperative effort by the North Carolina Department of Transportation, the Metropolitan Planning Organizations (MPO), and local advisory committees, the study will detail both short-term, medium-term, and long-term traffic management needs for this area.

START DATE: October 1993

END DATE: March 1995

STATUS: Initial planning meetings are underway. A draft proposal by the Institute for Transportation Research and Education is currently being reviewed by an advisory committee.

ESTIMATED TOTAL PROJECT COST: $312,500

ANTICIPATED TOTAL FEDERAL SHARE: $250,000

FEDERAL FUNDS THROUGH FY 93: $250,000

CONTACT: Susan Mooney, FHWA Region 4, Georgia, HES-04, (404) 347-4075

ROCHESTER, NEW YORK AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: This project will provide direction for the design of an area wide advanced traffic management (ATMS) system which can be implemented within the next few years and which can be integrated with the existing computerized arterial signal system. The project consists of three tasks. The objective of Task I is to conduct an area-wide corridor assessment to inventory and identify existing congestion problems. This task will also evaluate freeway management techniques and detection technologies. Task II will review communication processes and incident response plan in order to develop a comprehensive incident management program. Task III will focus on overcoming the technical and legal stumbling blocks that impede the working relationship between area jurisdictions. This will be accomplished by identifying, prioritizing, and recommending solutions for inter-jurisdictional issues.

START DATE: Late Spring 1994

END DATE: Late Spring 1995

STATUS: It is anticipated that study recommendations will include surveillance and control functions on the freeway system and integration of these new systems with an existing and very effective Urban Traffic Control System. Initiation of an incident management program is also an expected outcome. Agency cooperation is already good. No new IVHS positions have been created thus far; staffing of control center may increase with expanded coverage.

ESTIMATED TOTAL PROJECT COST: $500,000

ANTICIPATED TOTAL FEDERAL SHARE: $400,000

FEDERAL FUNDS THROUGH FY 93: $400,000

CONTACT: Mark Bartlett, FHWA, New York Division, HDA-NY, (518) 472-4131

SACRAMENTO, CALIFORNIA
EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:	This study will result in a Strategic IVHS Deployment Plan for the Sacramento metropolitan area. The full range of IVHS user services will be considered in the development of this plan.
START DATE:	1993
END DATE:	1995
STATUS:	The detailed work plan for this study is currently being prepared.
ESTIMATED TOTAL PROJECT COST:	$500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTACT:	Jeff Lindley, FHWA Region 9, HPD-09, (415) 744-2659 Frank Cechini, FHWA California Division, (916) 551-1079 Michael Hoffacker, Sacramento Area Council of Governments, (916) 457-2264

ST. LOUIS, MISSOURI AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The objective is to utilize a consultant to develop a freeway management plan for the bi-state St. Louis area. This plan will incorporate IVHS technologies principally in the Advanced Traffic Management Systems (ATMS) and Advanced Traveler Information Systems (ATIS) areas. It will recommend specific strategies for incorporation into a comprehensive plan designed to meet future needs using IHVS technologies. The study will assess current operations such as the call box and emergency patrol operations. It will make recommendations for staffing structure and requirements. The study will recommend a future freeway management plan built around a basic framework. Elements to be considered in the plan include communications techniques, detection methods, information dissemination, ramp metering and cellular incident response.

START DATE: September 18, 1992

END DATE: May 31, 1994

STATUS: The accomplishments so far have been the establishment of a good working relationship between the Missouri Highway and Transportation Department, the Illinois Department of Transportation and the MPO in the St. Louis area. It is predicted that when the Early Deployment study is finished the findings will be used to assist in scheduling future IVHS projects.

ESTIMATED TOTAL PROJECT COST: $350,000

ANTICIPATED TOTAL FEDERAL SHARE: $280,000

FEDERAL FUNDS THROUGH FY 93: $280,000

CONTRACTOR: Edwards & Kelcey, Inc.

CONTACT: Bruce Baldwin, FHWA Region 7, HTA-07, (816) 926-7955

SALT LAKE CITY, UTAH AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: This Early Deployment Planning project is developing an Intelligent Vehicle/Highway Strategic Plan for the Salt Lake City Metropolitan Area. The plan will provide a guide for the implementation and deployment of IVHS technologies throughout the metro area. This plan will coordinate with and enhance an ongoing contract to develop an advanced traffic signal improvement plan covering essentially the same geographic area.

START DATE: September 1993

END DATE: December 1995

STATUS: Development of the Request For Proposal (RFP) is in progress. Release of the RFP is expected in February, 1994.

ESTIMATED TOTAL PROJECT COST: $500,000

ANTICIPATED TOTAL FEDERAL SHARE: $400,000

FEDERAL FUNDS THROUGH FY 93: $400,000

CONTACT: C. P. Damon, FHWA Region 8, HPD-08, (303) 969-6712

SAN FRANCISCO BAY AREA
EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:	This study will result in a Strategic IVHS Deployment Plan for the San Francisco Bay Area, which encompasses nine counties and over 100 local jurisdictions. The full range of IVHS user services will be considered in the development of this plan.
START DATE:	1993
END DATE:	1995
STATUS:	The detailed work plan for this study is currently being prepared.
ESTIMATED TOTAL PROJECT COST:	$562,500
ANTICIPATED TOTAL FEDERAL SHARE:	$450,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTACT:	Jeff Lindley, FHWA Region 9, HPD-09, (415) 744-2659 Frank Cechini, FHWA California Division, (916) 551-1079 Jeff Georgovitch, Metropolitan Transportation Commission, (510) 464-7700

SAN JUAN, PUERTO RICO AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:	As a recipient of an IVHS Early Deployment Grant, the Commonwealth of Puerto Rico is investigating the feasibility of implementing various IVHS technologies throughout its metropolitan area to reduce congestion while maximizing the utility of all its transportation modes. The plan includes the interaction with the proposed light-rail mass transit system to be constructed within the next decade.
START DATE:	May 1994
END DATE:	September 1995
STATUS:	Development of the scope of work is underway.
ESTIMATED TOTAL PROJECT COST:	$500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	N/A
CONTRACTOR:	To be determined.
CONTACT:	Miguel A. Correa, FHWA Puerto Rico Division, (809) 766-5600 HB-MD-(410) 962-4440

SEATTLE, WASHINGTON TO PORTLAND, OREGON CORRIDOR EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:	The objective of this study is to develop a plan to reduce congestion and improve safety along the Interstate-5 corridor between Portland and Seattle utilizing Intelligent Vehicle Highway Systems technologies.
START DATE:	March 1994
END DATE:	March 1995 (anticipated)
STATUS:	A consultant has been selected (David Evans and Associates) to perform this study in conjunction with a Washington State Department of Transportation (WSDOT) funded study of overall communications needs in the same corridor.
ESTIMATED TOTAL PROJECT COST:	$150,000 (Does not include WSDOT funding of communications needs study)
ANTICIPATED TOTAL FEDERAL SHARE:	$120,000
FEDERAL FUNDS THROUGH FY 93:	$120,000
CONTACT:	Ed Fischer, FHWA Region 10, Portland, Oregon, HEO-10, (503) 326-2071 Morgan Balogh, WSDOT, Seattle, Wash., (206) 543-0078

TAMPA, FLORIDA AREAWIDE EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION: The project has developed an action plan for the implementation of an integrated transportation information center for the Tampa Bay area. The plan includes methods of obtaining real-time traffic condition data, integrating it into a reliable and continuous database, and disseminating condition information to the traveler in a usable and timely manner. The project is intended to result in an action plan which can be used for this implementation. The project contains six work tasks: 1) establish a multi-agency project advisory group to oversee the project work; 2) identify and evaluate the methods available for gathering real time traffic condition information; 3) analyze control center alternatives, including location and operations; 4) analyze various information dissemination techniques addressing multiple media applications; 5) conduct a small scale market research effort to determine user preferences for interpreting traffic condition information; and 6) provide a final report consisting of technical memoranda and the recommended action plan. Also, a brochure oriented to the general public will be developed summarizing the project action plan.

START DATE: November 1992

END DATE: November 1993

STATUS: The project was completed in October 1993. The brochure is currently being developed for distribution. The project report is available for distribution.

ESTIMATED TOTAL PROJECT COST: $100,000

ANTICIPATED TOTAL FEDERAL SHARE: $80,000

FEDERAL FUNDS THROUGH FY 93: $80,000

CONTACT: Susan Mooney, FHWA Region 4, HES-04, (404) 347-4075

TUCSON, ARIZONA
EARLY DEPLOYMENT PLANNING STUDY

DESCRIPTION:	This study will result in the Strategic IVHS Deployment Plan for the Tucson metropolitan area. The full range of IVHS user services will be considered in the development of this plan.
START DATE:	September 1993
END DATE:	December 1995
STATUS:	The detailed work plan for this study is currently being prepared.
ESTIMATED TOTAL PROJECT COST:	$500,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$400,000
CONTACT:	Jackie Landsman, FHWA Region 9, HPD-09, (415) 744-3103 Alan Hansen, FHWA Arizona Division Office, HA-AZ, (602) 379-3646 Jim Altenstadter, PAG, (602) 628-5313

DEPLOYMENT SUPPORT

DEPLOYMENT SUPPORT

The challenge of developing and deploying IVHS user services is as much concerned with non-technical issues as with technology. Early operational tests and deployments of users services are being carefully monitored to identify and address real or potential constraints to deployment, and to develop strategies to remove or lower these non-technical barriers. The DOT has developed an Institutional and Legal Issues program to address those non-technical constraints and problems which will most directly affect the success of eventual deployment of IVHS user services.

Efforts are also underway to assess the public's understanding and acceptance of IVHS, and their willingness to pay for these services. An extensive technology transfer program also includes training and outreach to those who will ultimately be responsible for deploying IVHS user services. All of these activities are described in this section.

ANALYSIS OF FEDERAL AND STATE PRIVACY LAW AND DEVELOPMENT OF STRATEGIES TO ADDRESS PRIVACY CONCERNS

DESCRIPTION:	This effort will survey Federal and state privacy laws to determine which uses of information gathered through existing and proposed IVHS technologies are allowed under current law and which uses will be affected by pending legislation. It will recommend legal safeguards to ensure compliance with existing privacy laws and propose a strategy for promoting beneficial uses of information collected by IVHS. Strategies to safeguard privacy will be developed. Papers will be published in a special issue of the Santa Clara High Technology Law Journal.
START DATE:	September 22, 1993
END DATE:	September 21, 1994
STATUS:	On-going
ESTIMATED TOTAL PROJECT COST:	$199,176
ANTICIPATED TOTAL FEDERAL SHARE:	$199,176
FEDERAL FUNDS THROUGH FY 93:	$199,176
CONTRACTOR:	University of Santa Clara School of Law
CONTACT:	Julie Dingle, FHWA Headquarters, HCC-32, (202) 366-1394 Dorothy Glancy, University of Santa Clara School of Law (408) 554-4075

CARAT

LOCATION:	Charlotte, North Carolina
PARTNERS:	North Carolina DOT, City of Charlotte, University of North Carolina System, FHWA
START DATE:	March 1993
END DATE:	To be determined.
DESCRIPTION:	The Congestion Avoidance and Reduction for Automobiles and Trucks (CARAT) project is proposed by NCDOT as a long-range, comprehensive implementation of a congestion management project for freeways and connected arterials in the Charlotte urban area. The IVHS project is focusing on the development of valuable products based on the unique features of the CARAT project, especially the design/build/warrant (D/B/W) procurement process.
STATUS:	Funds have been obligated to support the design/ build/ warrant procurement process and for project evaluation emphasizing human factors as a design criteria.
ESTIMATED TOTAL PROJECT COST:	To be determined.
ANTICIPATED TOTAL FEDERAL SHARE:	To be determined.
FEDERAL FUNDS THROUGH FY 93:	$490,000
CONTACT:	Patrick Kennedy, FHWA South Carolina Division, HA-SC, (803) 253-3890 Susan Mooney, FHWA Region 4, HES-04, (404) 347-4075

COMMERCIAL VEHICLE OPERATIONS (CVO) INSTITUTIONAL ISSUES STUDIES

DESCRIPTION: This effort recognizes that the identification and resolution of institutional issues is important for the deployment of the IVHS Commercial Vehicle Operations (CVO) program. Up to $50,000 is being provided to each State to identify institutional issues that would impede or prevent the achievement of national CVO goals. Working groups will facilitate discussions, and a report will be prepared detailing findings.

START DATE: September 20, 1991

END DATE: Various

STATUS: The following studies are on-going: COVE (Colorado - lead, New Mexico, Arizona, Oklahoma, Texas, Louisiana, and Arkansas); Eastern States (Pennsylvania - Lead, West Virginia, Delaware, District of Columbia, Maryland, New York, New Jersey, and Virginia); Maine, New Hampshire, and Vermont; Illinois and Indiana; Kansas and Missouri; California; Massachusetts; Connecticut; Ohio; and Wisconsin.

These studies are complete: Western States (Washington - Lead, Oregon, Idaho, Nevada, Utah, Wyoming and Montana) ; Southeast States (North Carolina -Lead, Alabama, Mississippi, Georgia, Florida, South Carolina, Tennessee, Kentucky, Michigan and Virginia); Nebraska; Minnesota; and Iowa. Reports will be ready for distribution by early summer, 1994.

ESTIMATED TOTAL PROJECT COST: To be determined.

ANTICIPATED TOTAL FEDERAL SHARE: To be determined.

FEDERAL FUNDS THROUGH FY 93: $2,155,000

CONTRACTOR: Various

CONTACT: Denise Bednar, FHWA Headquarters, HTV-20, (202) 366-6143

EXPLORATION OF ALTERNATIVE PROCUREMENT MODELS FOR IVHS TECHNOLOGIES

DESCRIPTION: The objectives of this project are to (1) conduct legal research and analysis directed at streamlining and improving current processes to improve efficiency of procurement and (2) develop alternative models for procurement of IVHS technology which will be more efficient and effective than current procurement practices.

The research effort will include an examination of the requirements for competitive bidding, combined bidding, combined bidding/joint ventures, advertisement, content of proposals or bids, use of patented processes or technologies or exclusive sources, bid security deposits, submission of proposals, negotiations, awards of contracts, and intellectual property rights to technology developed or acquired under the procurement contract.

The primary emphasis will be examining these issues from a State perspective. The products of this project will include a conference on procurement issues and papers examining various topics on the subject.

START DATE: To be determined.

END DATE: To be determined.

STATUS: The Request for Proposals is tentatively scheduled to be issued by the summer of 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Beverly Russell, FHWA Headquarters, HTV-10, (202) 366-2202

IDENTIFICATION OF LEGAL ISSUES

DESCRIPTION:	The objective of this research was to conduct a review of public and private activities in the research, development, and deployment of IVHS in order to identify the legal constraints to those activities. The FHWA will implement more rigorous follow-up studies based on the recommendations in the reported.
START DATE:	July 1, 1992
END DATE:	December 1, 1992
STATUS:	Completed.
ESTIMATED TOTAL PROJECT COST:	$11,783
ANTICIPATED TOTAL FEDERAL SHARE:	$11,783
FEDERAL FUNDS THROUGH FY 93:	$11,783
CONTRACTOR:	Professor Kent Syverud, University of Michigan
CONTACT:	Julie Dingle, FHWA Headquarters, HCC-32, (202) 366-1394

INSTITUTIONAL AND LEGAL INNOVATIVE PROJECTS IN OPERATIONAL TESTS AND DEPLOYMENT PROJECTS

DESCRIPTION: This project will test new organizational and legal processes to implement IVHS in the context of operational tests and deployments. Solicitations for operational tests will be favorably weighted if these initiatives are incorporated into proposals for projects. If satisfactory proposals are received, funds set aside for each initiative will be used to support the activities necessary to its successful completion. The following initiatives would be explored:

Pre-agreement Conference - The present system of funding IVHS Operational Tests and Early Deployment projects is a vertical, hierarchical model of interjurisdictional cooperation. A Partnership Agreement is drafted at FHWA Headquarters and the draft is transmitted to the FHWA Regional Office to the FHWA Division and then to the State transportation agency. This project would explore new ways of developing Partnership Agreements to provide greater involvement by subgrantees and contractors in the development of the project and the negotiation of the Partnership Agreement. The product of this effort will be a report documenting and assessing the process of developing the Partnership Agreement. The results will be used to develop mechanisms to facilitate interjurisdictional cooperation.

Innovative Financing Methods - Legal and consulting services would be funded in this project to support entrepreneurial approaches to funding IVHS projects. Such approaches might include user fees, franchise fees, use of venture capital, or funding of potential safety enhancements by the insurance industry. Other innovative approaches might pursue non-traditional means of allocating funding responsibilities among participating jurisdictions.

Innovative Procurement Methods - FHWA will test innovative procurement methods such as State and local participation in consortia. Funds will be used to augment the expertise of public agencies in complex, high technology procurement by means of an intergovernmental procurement team, use of procurement consultants, or through temporary details of personnel from other governmental entities. A report will be prepared documenting and evaluating the procurement method used.

INSTITUTIONAL AND LEGAL INNOVATIVE PROJECTS IN OPERATIONAL TESTS AND DEPLOYMENT PROJECTS (cont.)

START DATE:	To be determined.
END DATE:	To be determined.
STATUS:	The project is in the developmental stages.
ESTIMATED TOTAL PROJECT COST:	N/A
ANTICIPATED TOTAL FEDERAL SHARE:	N/A
FEDERAL FUNDS THROUGH FY 93:	$0
CONTRACTOR:	To be determined.
CONTACT:	Cynthia Elliot, FHWA Headquarter, HTV-10, (202) 366-8707. Julie Dingle, FHWA Headquarters, HCC-32, (202) 366-1394

INTERDISCIPLINARY IVHS CONTRACTING COURSE

DESCRIPTION: This project will incorporate the results of IVHS institutional and legal research projects. The course will cover various aspects of contracting, including drafting of specifications or statements of work, allocation of intellectual property rights, ways to minimize or avoid protests and claims, and alternative procurement or funding mechanisms. The objective of the course will be to develop an understanding of the special requirements of high technology IVHS procurement. The course will be designed for State, local, and private sector project managers, procurement specialists, and attorneys. After course development and trial classes, the course may be offered through the FHWA's National Highway Institute.

START DATE: To be determined.

END DATE: To be determined.

STATUS: The project is in the developmental stages.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: To be determined.

CONTACT: Julie Dingle, FHWA Headquarters, HCC-32, (202) 366-1394

IVHS AND THE ENVIRONMENT IN URBAN AREAS

DESCRIPTION: The objectives of this project are to (1) identify and analyze potential environmental benefits from implementing IVHS and other advanced transportation systems; (2) examine policy tools and techniques for studying non-technical, IVHS environmental issues and their application in the formation of new models for Federal, state, and local cooperation in developing advanced transportation systems to support environmental improvements in the nation's urban areas; (3) organize and convene research symposia on environmental and related non-technical issues and develop proceedings and other policy studies on IVHS environmental and related nontechnical issues; (4) facilitate greater understanding and dialogue among policy-makers, program administrators, and interested private organizations in selected urban locations in the U.S. where IVHS and the need for environmental improvements exist; and (5) provide an objective forum for the exchange of information and research results from this and other related research and policy efforts.

START DATE: May 1993

END DATE: August 1994

STATUS: The contractor has held regional conferences in selected sites - Portland, Houston, and Minneapolis. A final environmental policy conference will be held in Washington, D.C. and will be co-sponsored with other organizations.

ESTIMATED TOTAL PROJECT COST: $1,064,000

ANTICIPATED TOTAL FEDERAL SHARE: $760,000

FEDERAL FUNDS THROUGH FY 93: $760,000

CONTRACTOR: To be determined.

CONTACT: Beverly Russell, FHWA Headquarters, HTV-10, (202) 366-2202

IVHS ENERGY AND ENVIRONMENTAL IMPACTS

DESCRIPTION: Studies will be implemented to develop improved understanding of the range of air quality impacts associated with deployment of IVHS strategies. The two-phased approach involves: (1) developing improved analytical methods for projecting vehicle fleet drive cycle changes, and related air quality impacts, resulting from deployment of IVHS strategies, and (2) developing systematic approach and preparing a user Guidebook for measuring and reporting the emissions impacts resulting from Operational Tests. A national workshop will be held in 1995 to present project findings and provide an orientation to using the Guidebook.

START DATE: Analytical Methods - October 1992
Guidebook/Emissions Data - November 1993

END DATE: Analytical Methods - January 1995
Guidebook/Emissions Data - October 1995

STATUS: The Volpe National Transportation Systems Center (VNTSC) is continuing earlier efforts to develop improved modeling capabilities with which to assess the air quality impacts of IVHS deployment. VNTSC also has initiated efforts to prepare a Guidebook for monitoring the air quality impacts in evidence at Operational Tests.

ESTIMATED TOTAL PROJECT COST: $550,000

ANTICIPATED TOTAL FEDERAL SHARE: $550,000

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: Volpe National Transportation Systems Center

CONTACT: Charles Goodman, FHWA Headquarters, HPP-12, (202) 366-8070

IVHS INSTITUTIONAL ISSUES: GEORGE MASON UNIVERSITY

DESCRIPTION: George Mason University's Institute of Public Policy will study critical mass transportation issues associated with the implementation of IVHS in Northern Virginia specifically and the United States more generally. It will identify areas in Northern Virginia where IVHS applications may be applied; conduct analytical policy studies; and develop educational outreach services for transportation policy and decision makers.

START DATE: March 1992

END DATE: February 1994

STATUS: GMU is continuing to carry out FTA's sponsored program of research and outreach on the topic of IVHS. Special areas of focus are: evaluation of IVHS systems, market demand for IVHS products and services, the transportation policy framework in which IVHS will be developed and deployed, and modeling of IVHS. Initial planning is underway for a major conference on issues associated with Metropolitan Planning Organization (MPO) implementation of ISTEA. GMU continues to prepare papers and/or participate in conferences relating to institutional issues associated with regional deployment of IVHS.

GMU will solicit private sector involvement in the implementation of IVHS technologies like kiosks. GMU will conduct workshops on IVHS topics such as evaluation, deployment, and institutional constraints.

ESTIMATED TOTAL PROJECT COST: $750,000

ANTICIPATED TOTAL FEDERAL SHARE: $750,000

FEDERAL FUNDS THROUGH FY 93: $621,729

CONTRACTOR: George Mason University

CONTACT: Ronald Fisher, FTA Headquarters, UTS-30, (202) 366-4995

IVHS STAFFING AND EDUCATIONAL NEEDS

DESCRIPTION: The objectives of this study were to: (1) assess current beliefs as to IVHS educational and staffing needs for both the short-and long- terms; (2) assess the current job market to determine the availability of the technical and program (e.g. program management, legal, and policy) skills to adequately address these needs; (3) use economic, policy, and educational statistical material to project future trends in the technical and program management job market applicable to IVHS; and (4) provide recommendations on strategies for public agencies, the private sector, and academic institutions to ensure that the necessary technical and program skills will be available in the U.S. job market.

The end product of this contract was a comprehensive report on IVHS educational and staffing needs, including recommended strategies for the public, private, and academic sectors to ensure these needs are met. The report was used to develop the Staffing and Education Chapter of the Nontechnical Constraints Report to Congress.

START DATE: September 1992

END DATE: August 1993

STATUS: This project is complete.

ESTIMATED TOTAL PROJECT COST: $144,449

ANTICIPATED TOTAL FEDERAL SHARE: $144,449

FEDERAL FUNDS THROUGH FY 93: $144,449

CONTRACTOR: The Urban Institute

CONTACT: Beverly Russell, FHWA Headquarters, HTV-10, (202) 366-2202

IVHS USER ACCEPTANCE RESEARCH

DESCRIPTION: The FHWA will conduct primary research to determine end users' acceptance and willingness to pay for IVHS user services. The research will survey various end-users and potential purchasers of IVHS products and services in different population groupings and geographical regions through exposure to detailed descriptions of specific user service functions, simulations, and field tests.

START DATE: To be determined.

END DATE: To be determined.

STATUS: Preliminary analysis of market segmentation and potential research design is underway.

ESTIMATED TOTAL PROJECT COST: To be determined.

ANTICIPATED TOTAL FEDERAL SHARE: To be determined.

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: To be determined.

CONTACT: Cynthia Elliot, FHWA Headquarter, HTV-10, (202) 366-8707

IVHS USER ACCEPTANCE RESEARCH SUPPORT

DESCRIPTION: Market research experts will provide guidance to FHWA for assessing public benefits and market potential for IVHS user services. Guidance will cover accepted principles for conducting user acceptance research, identification of critical market factors, development of alternative research designs, and related research activities.

START DATE: January 1994

END DATE: December 1994

STATUS: Contractor has conducted briefings for DOT personnel in user acceptance research and recommended alternative approaches for conducting user acceptance research.

ESTIMATED TOTAL PROJECT COST: $235,000

ANTICIPATED TOTAL FEDERAL SHARE: $235,000

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: Battelle

CONTACT: Cynthia Elliot, FHWA Headquarter, HTV-10, (202) 366-8707.

LEGAL CONSTRAINTS AND FAIR ACCESS ISSUES RELATED TO FRANCHISING OF IN-GROUND COMMUNICATIONS TECHNOLOGIES ALONG HIGHWAY RIGHTS OF WAY

DESCRIPTION: A number of State Departments of Transportation are considering offering franchise opportunities to commercial communications companies along highway rights of way to support IVHS and communications operations. This project will fund research to: (1) identify the Federal, State, and local statutory and regulatory framework for use of highway rights of way and changes needed to permit such franchising; (2) identify related transportation and communication systems in which the government controls or regulates access to the system; (3) examine means used to attempt to equitably distribute access to such systems among commercial competitors; (4) identify means used to retain government access to such systems; and (5) examine options used for government preservation of points of access for potential expansion of such systems. Based on the results of this research, recommendations will be made for appropriate mechanisms to franchise rights to installation and use of in-ground communications systems along highway rights of way.

START DATE: To be determined.

END DATE: To be determined.

STATUS: The project is in the developmental stages.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: To be determined.

CONTACT: Cynthia Elliot, FHWA Headquarter, HTV-10, (202) 366-8707

LESSONS FROM OTHER TECHNOLOGIES: OVERCOMING BARRIERS TO IVHS DEPLOYMENT

DESCRIPTION: This research identifies the institutional barriers that may affect the implementation of Advanced Traffic Management Systems (ATMS) and Advanced Traveler Information Systems (ATIS). It will investigate barriers that were encountered in the deployment or attempted deployment of other technologies. It will analyze the source of the barriers and what strategies policy makers implemented to overcome these barriers. The research team will address many technologies and will conduct up to nine detailed case studies. The team will also investigate the institutional barriers that have been encountered by the existing IVHS operational tests. The study will identify and analyze alternative public/private partnerships created to provide these IVHS services, including developing a model franchise agreement.

START DATE: February 1993

END DATE: April 1995

STATUS: The Urban Institute has conducted a preliminary investigation of IVHS institutional issues relating to deployment and comparable deployment issue in other technologies. A draft report on this initial task is expected in late summer 1994.

ESTIMATED TOTAL PROJECT COST: $467,926

ANTICIPATED TOTAL FEDERAL SHARE: $467,926

FEDERAL FUNDS THROUGH FY 93: $300,000

CONTRACTOR: The Urban Institute

CONTACT: Dr. James Saklas, FHWA Headquarters, HPP-12, (202) 366-9254

LIABILITY CONFERENCE

DESCRIPTION: The product of this effort will be research papers and a conference on tort liability and IVHS. This conference will include presentations on the legal research to date on tort liability and IVHS, along with papers prepared specifically for the conference. The objective of the conference is to convene experts in the fields of liability and IVHS in order to educate IVHS participants and move toward a consensus on liability risks (including which activities present significant liability risks and which do not) and risk management. The product of this effort will be a conference and conference manual which will serve as a reference for IVHS participants.

START DATE: To be determined.

END DATE: To be determined.

STATUS: The Request for Proposals is tentatively scheduled to be issued by spring 1994.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Beverly Russell, FHWA Headquarters, HTV-10, (202) 366-2202

METROPOLITAN TRAFFIC MANAGEMENT

DESCRIPTION: The objective of this study is to determine whether there are specific impediments to greater coordination among regional and metropolitan traffic management operations. Responsibility for traffic management operations has evolved over time in response to differing requirements, resource availability and institutional and political arrangements. In metropolitan areas, such responsibilities are usually found dispersed among distinct political jurisdictions and within jurisdictions there are likely to be a number of separate agencies involved in various aspects of traffic management operations. The various IVHS technologies have been proposed as potentially of great value in enhancing the efficiency of metropolitan traffic management services and other services made feasible by new technologies.

There are three main parts to this study: (1) a review of the relevant literature in traffic management, public administration, organization theory, and economics related to metropolitan cooperation; (2) a review of the current state of coordination and cooperation in metropolitan traffic management practices; and (3) recommendations for facilitating closer coordination (where it is needed), including federal standards, model legislation, funding mechanism changes, etc.

START DATE: October 1992

END DATE: December 1993

STATUS: A final report has been submitted, and copies are available from the contact.

ESTIMATED TOTAL PROJECT COST: $200,000

ANTICIPATED TOTAL FEDERAL SHARE: $200,000

FEDERAL FUNDS THROUGH FY 93: $200,000

CONTRACTOR: Volpe National Transportation Systems Center

CONTACT: Thomas Marchessault, DOT Office of the Secretary, P-37, (202) 366-5412

NON-TECHNICAL CONSTRAINTS REPORT

DESCRIPTION: The objective of this project is to complete the Report to Congress on Nontechnical Barriers to IVHS required by the Intelligent Vehicle Highway Systems Act (Title VI, Part B of the Intermodal Surface Transportation Efficiency Act [ISTEA] of 1991, P.L. 102-240, Section 6054(d)). The report is due to Congress by December 1993. The Department of Transportation, in cooperation with the Departments of Justice and Commerce, is required to submit a report addressing nontechnical constraints and barriers to IVHS including antitrust, privacy, educational and staffing needs, patent, liability, and standards. The report shall (1) provide recommendations for legislative and administrative actions necessary to further the IVHS program and (2) address ways to further promote industry and State and local involvement in the program.

START DATE: January 1993

END DATE: April 1994

STATUS: Ongoing

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: Various

CONTACT: Thomas Marchessault, DOT Office of the Secretary, P-37, (202) 366-5412

OPERATIONAL TEST CASE STUDIES

DESCRIPTION: A "case study" approach will be used to track and examine institutional and legal issues in developing U.S. operational tests. The Volpe National Transportation Systems Center (VNTSC) will monitor selected operational tests including Advance, Advantage I-75, FAST-TRAC, Houston Smart Commuter, Delaware SmartDart, Transcom/Transmit, Seattle FAME, Travel-Aid, and the Potomac Rappahannock Transportation Commission project. The primary objective of the case studies is to answer four questions: (1) What institutional and legal impediments were encountered establishing and deploying IVHS services and products during operational tests? (2) Where in the life cycle of the operational test did these impediments occur? (3) What caused these issues to arise and how were impediments overcome? (4) What lessons were learned in dealing with these impediments that can be applied to other tests and deployments of IVHS products and services?

The case studies are intended to be illustrative and descriptive in nature. They are not intended to be technically-oriented, provide an evaluation (i.e., comparing an observed outcome of the operational test to an expected level of performance) or show cause and effect (i.e., identifying whether the operational test has contributed to changes in base condition or event).

START DATE: February 1994

END DATE: N/A

STATUS: Preliminary contacts to arrange monitoring activities are underway.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: To be determined.

CONTACT: Cynthia Elliot, FHWA Headquarters, HTV-10, (202) 366-8707

OPERATIONAL TEST SOLICITATION ON SMALL BUSINESS, CONSORTIA OPPORTUNITIES

DESCRIPTION: One of the primary goals of the IVHS program as represented in the Intermodal Surface Transportation Efficiency Act is the development and promotion of an IVHS industry. The purpose of this project is to examine means of involving small businesses including disadvantaged business enterprises, defense companies, and innovative partnerships/corporations in the rapidly growing industry. These companies will be invited to submit proposals to develop feasibility studies for IVHS operational tests. Historically Black Colleges and Universities will be encouraged to partner or facilitate these joint efforts. Projects with a strong likelihood for success and which advance the goals of the IVHS program would be given serious consideration for funding to implement the test (implementation funding is not included here).

START DATE: To be determined.

END DATE: To be determined.

STATUS: The project is in the developmental stages.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: To be determined.

CONTACT: Beverly Russell, FHWA Headquarters, HTV-10,(202) 366-2202

PUBLIC ACCEPTANCE OF IVHS TECHNOLOGIES AND SERVICES

DESCRIPTION: This project will include analysis of public acceptance and potential markets for IVHS services and users' willingness-to-pay for various bundles of services. In order to help policy makers better understand the role of business planning and evaluating market attractiveness in the development and deployment of IVHS products and services, the following products will be provided: (1) a briefing paper on how commercial firms evaluate market attractiveness in general and for high risk products or services, (2) a briefing paper defining and segmenting IVHS products and services to their respective markets, and (3) a case study examining the evolution of a successfully developed and deployed IVHS product or service (such as automated vehicle identification or location).

START DATE: October 1992

END DATE: September 1994

STATUS: The VNTSC has developed a draft report.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: $300,000

CONTRACTOR: Volpe National Transportation Systems Center

CONTACT: Cynthia Elliot, FHWA Headquarter, HTV-10, (202) 366-8707

PUBLIC-PRIVATE PARTNERSHIPS AND THEIR RELATIONSHIP TO IVHS AND ENHANCED TRAFFIC ENGINEERING

DESCRIPTION: Under this project, six regional workshops will be held around the country to assist the public and private sectors in establishing partnerships that will aid in the deployment of IVHS technologies. The workshops will address public/private roles, institutional issues and barriers to implementation, funding and financial implications, legal and liability issues, technology, and data collection. The workshops are expected to take place between June and December, 1994. FHWA Field Office Representatives,State and local agency representatives in decision- making positions, and Business and Industry representatives that may provide IVHS products and services.

START DATE: March 1994

END DATE: September 1995

STATUS: Project underway. Development of handbook for workshops is beginning. Workshops are expected to begin in July, 1994 and proceed through February, 1995.

ESTIMATED TOTAL PROJECT COST: $200,000

ANTICIPATED TOTAL FEDERAL SHARE: $200,000

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTOR: Klick, Kent, and Allen, Inc., Alexandria, Va.

CONTACT: Wayne Berman, FHWA Headquarters, HTV-31, (202) 366-4069

SOCIETAL IMPACT STUDY OF TRANSPORTATION AND ADVANCED TECHNOLOGY

DESCRIPTION:	This study will begin to review the income distribution impact of IVHS, other social impacts of IVHS, and the relationship of IVHS services to other information technology policy initiatives.
START DATE:	April 1994
END DATE:	To be determined.
STATUS:	The project is in the developmental stage.
ESTIMATED TOTAL PROJECT COST:	$400,000
ANTICIPATED TOTAL FEDERAL SHARE:	$400,000
FEDERAL FUNDS THROUGH FY 93:	$0
CONTRACTOR:	To be determined.
CONTACT:	Thomas Marchessault, DOT Office of the Secretary, P-37, (202) 366-5412

TECHNOLOGY TRANSFER

DESCRIPTION: The FHWA continues to fund projects which provide guidance and support for IVHS deployment. Projects focus on upgrading the state-of-the-practice in transportation operations and management by facilitating the planning for and deployment of proven IVHS technologies. A wide array of formal training courses and other outreach activities are currently underway and new ones are under development. Nearly $2.2 million was expended in FY '93, to initiate a number of projects. Current and anticipated products of these projects include: (1) a manual for marketing HOV; (2) videos and workshops on travel demand management; (3) an expert system for wide area incident management; (4) a training simulator for presenting traffic control strategies; (5) prototype congestion management systems; (6) a clearinghouse/bulletin board in conjunction with ITE to respond to traffic engineering problems and inquiries; (7) a database of relevant traffic engineering documents and software; (8) a process for assessing incident management strategies and algorithms; (9) an expert system for enhancing the utility and accuracy of TRANSYT-7F; (10) an overview of IVHS planning and functional requirements; and (11) regional workshops on establishing partnerships for IVHS deployments.

CONTACT: Ron Giguere, FHWA Headquarters, HTV-32, (202) 366-2203

PROGRAM ASSESSMENT

PROGRAM ASSESSMENT

Program assessment allows changes in technology, market conditions, and program successes and failures to be reflected in future IVHS program activities. Operational tests are specifically designed to evaluate applications of new technologies in an operational highway environment where such systems will ultimately be deployed. This component of the national IVHS program allows project participants to gain a better understanding of user service requirements, to identify acceptable system concepts and technologies, and to directly measure benefits, costs and other impacts. Therefore, evaluation is the critical element of all operational test projects. The DOT is developing criteria and standard methodologies to be used in conducting these evaluations, with the goal of ensuring that a uniform basis is used to compare results across various IVHS operational tests.

The DOT is also funding studies to assess the environmental and other societal impacts of IVHS, and to develop strategies to mitigate any potentially negative effects. Activities to support program assessment are described in this section.

ADVANCED PUBLIC TRANSPORTATION SYSTEMS (APTS) OPERATIONAL TEST EVALUATIONS

DESCRIPTION: Project evaluation is the link between operational tests and technology transfer from the APTS Program. It serves as the bridge between the conduct of a particular operational test and understanding the actual performance at the site, as well as potential effectiveness at other locales. Specific objectives for each test are identified along with measures of effectiveness to communicate results to all interested professionals. Key issues will be evaluated ranging from the reliability of particular new technologies in transit applications to the effectiveness of new service and management methods made possible by the technologies. Crosscutting studies will be contracted to develop a national set of insights across different site conditions.

START DATE: N/A

END DATE: Ongoing

STATUS: Evaluation guidelines have been developed and site specific evaluations have been performed at several sites. Evaluation plans have been developed for projects located in Bellevue, WA and Denver, Colorado. A strategy for developing the evaluation plan has been prepared for Sacramento, Santa Clara County, Houston and Dallas.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: $500,000

FEDERAL FUNDS THROUGH FY 93: $500,000

CONTRACTOR: Volpe National Transportation Systems Center

CONTACT: Ronald Fisher, FTA Headquarters, (202) 366-4995
Robert Casey, VNTSC/RSPA, Cambridge, Mass., (617) 494-2213

AN IVHS BENEFITS ASSESSMENT FRAMEWORK

DESCRIPTION: This project is developing an analytical framework for assessing the benefits achievable from the deployment of IVHS technologies and strategies. The framework utilizes existing computer models for estimating potential changes in congestion, vehicle emissions, energy consumption, safety and other values. Although the framework is intended to encompass most IVHS technologies, this project primarily is concentrated on Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), and interacting Advanced Public Transit Systems (APTS). Planning models are used to assess both short- and long-term impacts of proposed IVHS deployments.

The product of this effort will be a set of interrelated models for estimating the impacts of specific IVHS deployment proposals. Network and corridor case studies will be produced using existing operational tests and corridor projects for which data exists.

START DATE: April 1992

END DATE: October 1993

STATUS: A prototype assessment framework which has studied the impacts of the deployment of a limited number of IVHS user services for a specific case study has been developed. A final report describing this stage of the framework development, specifically how various travel demand forecasting and traffic simulation models have been linked, is anticipated to be available in May 1994. Future work to be conducted by Volpe National Transportation Systems Center (VNTSC) will further validate the framework and transfer its use to other sites and other user services.

ESTIMATED TOTAL PROJECT COST: $4,000,000

ANTICIPATED TOTAL FEDERAL SHARE: $4,000,000

FEDERAL FUNDS THROUGH FY 93: $1,600,000

CONTRACTOR: Volpe National Transportation Systems Center (VNTSC)

CONTACT: Ronald K. Giguere, FHWA Headquarters, HTV-32, (202) 366-2203

EVALUATION SUPPORT FOR OPERATIONAL TESTS

DESCRIPTION: This effort will focus on providing the necessary staffing and expertise to assist in the development of evaluation plans and provide technical assistance in the monitoring the evaluation for IVHS operational tests nationwide. This effort will develop a set of standard evaluation procedures and criteria for IVHS. This will form a common basis for comparison of similar projects, interpretation of testing/demonstration project results, and build upon the work conducted by the MITRE Corporation, the Oak Ridge National Laboratory, and the Volpe National Transportation Systems Center.

START DATE: To be determined.

END DATE: To be determined.

STATUS: Procurement is underway.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: To be determined.

CONTACT: Michael Freitas, FHWA R&D, HSR-10, (703) 285-2421

FUEL CONSUMPTION AND EMISSION VALUES FOR TRAFFIC MODELS

DESCRIPTION: The study consists of three tasks: (1) evaluate and compare the visibility and efficacy of TRAF-NETSIM and MOBILE 5 to predict emissions and fuel consumption, and identify potential enhancements to TRAF-NETSIM that will facilitate more accurate predictions; (2) identify measurement equipment and techniques for collecting model vehicle emissions and fuel consumption data to be used in TRAF-NETSIM; (3) identify parameters (such as engine/vehicle size/weight, power, etc.) that can be used to model emissions and fuel consumption for a large population of vehicles, and extrapolate those that will be measured.

START DATE: September 1993

END DATE: September 1995

STATUS: The contractor is embarking on three parallel tasks, as described above.

ESTIMATED TOTAL PROJECT COST: $900,000

ANTICIPATED TOTAL FEDERAL SHARE: $900,000

FEDERAL FUNDS THROUGH FY 93: $900,000

CONTRACTOR: Oak Ridge National Laboratory (ORNL)

CONTACT: Aladdin Barkawi, FHWA R&D, HSR-11, (703) 285-2093

GUIDELINES FOR IVHS OPERATIONAL TEST EVALUATION PLANS: ADVANCED TRAVELER INFORMATION SYSTEMS (ATIS) AND ADVANCED TRAFFIC MANAGEMENT SYSTEMS (ATMS)

DESCRIPTION: This document will provide guidelines for evaluation IVHS Advanced Traveler Information Systems (ATIS)/Advance Traffic Management Systems (ATMS) operational tests. The guidelines call for a five phase process: operational test definition, evaluation definition, evaluation plan design, evaluation plan performance, and reporting. Project participants are assigned specific responsibilities. Formats for evaluation test plans and sample evaluation objectives are also included. This document will become the basis for similar guidelines for evaluating Commercial Vehicle Operations (CVO) Operational Tests.

START DATE: April 1991

END DATE: January 1993

STATUS: Document published as MITRE Working Paper, WP92W230, dated November 1992.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: The MITRE Corporation

CONTACT: Michael Freitas, FHWA R&D, HSR-12, (703) 285-2421

MEASURING USER RESPONSE AT OPERATIONAL TESTS

DESCRIPTION: A comprehensive market data collection and usage monitoring process will be developed for use at Operational Test sites. The evaluation process will constitute a common framework with which to assess the user response and other market demand aspects in evidence at current and future Operational Test sites. A workshop will be held where an independent panel of IVHS evaluators and market research analysts will contribute to the effort.

START DATE: November 1993

END DATE: September 1995

STATUS: In initiating project activities, the Volpe National Transportation Systems Center will participate in a "Market Research" Seminar. That seminar will provide an overall orientation to market research, and will outline issues unique in applying market research concepts to IVHS.

ESTIMATED TOTAL PROJECT COST: $250,000

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: This is a new project for FY 1994.

CONTRACTOR: Volpe National Transportation Systems Center

CONTACT: Charles Goodman, FHWA Headquarters, HPP-12, (202) 366-8070

QUALITATIVE ASSESSMENT OF IVHS EMISSION AND AIR QUALITY IMPACTS

DESCRIPTION: The objectives of this study were to assess qualitatively the potential emission impacts of IVHS and set a framework for further research to develop the tools needed to quantify the effects.

This report was completed under the auspices of a broader contract that the FHWA's Office of Planning has with the Volpe National Transportation Systems Center.

START DATE: March 1993

END DATE: July 1993

STATUS: This project is complete.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: Jack Faucett Associates

CONTACT: Ron Giguere, FHWA Headquarters, HTV-32, (202) 366-2203

REFERENCE ON INTERNAL INSTITUTIONAL EVALUATION OF OPERATIONAL TESTS

DESCRIPTION:	The reference will be part of the overall preliminary evaluation guidelines being developed by the MITRE Corporation for operational tests managers or their designated contractors. The guidelines will cover both nontechnical and technical evaluations.
START DATE:	June 1, 1992
END DATE:	To be determined.
STATUS:	Initial guidance have been prepared, and expansion is underway based on results of case studies of operational tests and recommendations on legal elements.
ESTIMATED TOTAL PROJECT COST:	$150,000
ANTICIPATED TOTAL FEDERAL SHARE:	$150,000
FEDERAL FUNDS THROUGH FY 93:	$150,000
CONTRACTOR:	MITRE Corporation
CONTACT:	Michael Freitas, FHWA R&D, HSR-10, (703) 285-2421

SAFETY EVALUATIONS OF DOT IVHS OPERATIONAL TESTS

DESCRIPTION:	Develop and apply evaluation protocols to assess the safety impact of IVHS technologies being evaluated in U.S. DOT operational tests. The systems being tested are designed primarily to increase the efficiency of traffic flow; e.g., route guidance systems.
START DATE:	May 1991
END DATE:	On-going
STATUS:	Evaluation of TravTek (Orlando, Florida) route guidance and navigation systems is underway. Planning and implementation are underway for the TRAVEL AID (Seattle, Washington) hazard warning systems and the ADVANCE (Chicago) and FAST-TRAC (Oakland County, Michigan) route guidance and navigation systems.
ESTIMATED TOTAL PROJECT COST:	To be determined.
ANTICIPATED TOTAL FEDERAL SHARE:	To be determined.
FEDERAL FUNDS THROUGH FY 93:	$1,350,000
CONTRACTOR:	Various
CONTACT:	August Burgett, NHTSA Headquarters, NRD-51, (202) 366-5672

OTHER RELATED PROJECTS

Other Related Projects

(Research and Development)

IVHS IDEA PROGRAM

DESCRIPTION:	The objective of this initiative is to establish a continuing program to identify and explore innovative concepts for Intelligent Vehicle Highway Systems (IVHS) that are proposed by individual researchers both within and outside the usual transportation research community.
START DATE:	1992
END DATE:	1995
STATUS:	The first awards have been made. A second set of proposals are being evaluated.
ESTIMATED TOTAL PROJECT COST:	$5,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$5,000,000
FEDERAL FUNDS THROUGH FY 93:	$2,000,000
CONTRACTOR:	Transportation Research Board
CONTACT:	Michael Freitas, FHWA R&D, HSR-10, (703) 285-2421 Jack Ference, NHTSA Headquarters, NRD-51, (202) 366-0168

IVHS RESEARCH CENTERS OF EXCELLENCE

DESCRIPTION: IVHS Research Centers of Excellence (RCE's) have been established at three universities. The purpose of these centers is to create an environment where a quality mix of basic and applied research will be conducted to advance the IVHS Program while attracting high quality students and professors to the IVHS program.

START DATE: September 30, 1993

END DATE: September 30, 1998

STATUS: The operation of each of the centers has been initiated. Each center has conducted at least one meeting of their advisory committee and each center has or is in the process of initiating the first projects funded with RCE funds.

ESTIMATED TOTAL PROJECT COST: $19,000,000 (based on a minimum match of funds from private industry, State and local government, etc.)

ANTICIPATED TOTAL FEDERAL SHARE: $15,000,000

FEDERAL FUNDS THROUGH FY 93: $0

CONTRACTORS: Texas A&M University, University of Michigan, and Virginia Polytechnic Institute

CONTACT: Michael Freitas, FHWA R&D, HSR-13, (703) 285-2421

RESEARCH AND ANALYSIS FOR THE IVHS PROGRAM

DESCRIPTION: This is a renewed inter-agency agreement to provide support services for the FHWA IVHS R&D program by the Oak Ridge National Laboratory (ORNL). Through this contract, ORNL staff provides technical assistance in the development of IVHS R&D programs, assists in the evaluation of proposal and contract deliverables, develops prototypes to determine the feasibility of high-risk research projects, and assists in the coordination of IVHS-related research external to FHWA.

START DATE: July 31, 1991

END DATE: July 31, 1994

STATUS: This contract currently has 11 task orders. Some current studies under this contract are: Design and Development of INET, Development of Traffic Flow Theory Report, Fuel Consumption and Emission Values, Link ID Format and Map Database Requirements, and Wide Area Surveillance Systems.

ESTIMATED TOTAL PROJECT COST: N/A

ANTICIPATED TOTAL FEDERAL SHARE: N/A

FEDERAL FUNDS THROUGH FY 93: N/A

CONTRACTOR: Oak Ridge National Laboratory (ORNL)

CONTACT: Alberto J. Santiago, FHWA R&D, HSR-11, (703) 285-2092

Other Related Projects

(Other Projects)

GOLDEN GLADES INTERCHANGE

LOCATION:	Florida
PARTNERS:	Florida Department of Transportation (FLDOT), FHWA
START DATE:	1992
END DATE:	1994
DESCRIPTION:	The State of Florida will install advanced traffic management technologies at the Golden Glades Interchange on Interstate 95 in Dade County, Florida. Real-time monitoring and rapid verification of incidents will be provided with closed circuit television (CCTV), and variable message signs (VMS) will provide motorist information for this section of the freeway network.
STATUS:	Installation of the CCTV, VMS, and detectors is currently underway. Each was let under a separate contract and installation is expected to be complete by summer 1994.
ESTIMATED TOTAL PROJECT COST:	$4,125,000
ANTICIPATED TOTAL FEDERAL SHARE:	$3,300,000
FEDERAL FUNDS THROUGH FY 93:	$3,300,000
CONTACT:	Susan Mooney, FHWA Region 4, HES-04, (404) 347-4075

INTELLIGENT CORRIDOR SYSTEM

LOCATION: Southeast Florida

PARTNERS: FHWA, Florida Department of Transportation

START DATE: 1992

END DATE: 1994

DESCRIPTION: The Southeast Florida Intelligent Corridor System (ICS) is planned to eventually integrate elements of Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), Advanced Public Transportation Systems (APTS), Commercial Vehicle Operations (CVO), and Advanced Vehicle Control Systems (AVCS). The extensive intermodal aspects of the I-95 corridor within Palm Beach, Broward, and Dade Counties will be a priority in the development of the ICS, and initial early implementational activities will be centered around the ATMS function. Park-and-Ride lots, High Occupancy Vehicle (HOV) lanes, commuter rail, heavy rail, bus, and connections to airport and seaport facilities are all present in the corridor. The overall goal of the project will be to provide real-time information to assist I-95 corridor travelers with guidance and mode decisions prior to and during a trip.

STATUS: All data collection and analysis for the project has been completed. The consultant, JHK & Associates, is currently organizing and preparing the Final Reports. Completion of the reports (including a Design Report and a Final Report) is anticipated by April 1994.

ESTIMATED TOTAL PROJECT COST: To be determined.

ANTICIPATED TOTAL FEDERAL SHARE: $1,700,000

FEDERAL FUNDS THROUGH FY 93: $1,700,000

CONTACT: Susan Mooney, FHWA Reg 4, HES-04, (404) 347-4075

MAGIC

LOCATION:	Northern New Jersey
PARTNERS:	FHWA, New Jersey Department of Transportation (NJDOT)
START DATE:	1992
END DATE:	On-going
DESCRIPTION:	MAGIC (Metropolitan Area Guidance Information Center) is a system that will divert motorists from congested or emergency-related areas to alternative routes. The system will be implemented in three construction phases.
STATUS:	Route 80, Phase I was authorized for construction in Fall 1993. System installation, integration and testing should be completed by late 1995 or early 1996.
ESTIMATED TOTAL PROJECT COST:	$100,000,000
ANTICIPATED TOTAL FEDERAL SHARE:	$4,000,000
FEDERAL FUNDS THROUGH FY 93:	$4,000,000
CONTACT:	Jonathan McDade, FHWA Region 1, HPP-01, (518) 472-4253 Gary Corino, FHWA New Jersey, DET-NJ, (609) 989-2274 Richard Dube, New Jersey DOT, (609) 530-2448

MARYLAND - CHART STRATEGIC PLAN

LOCATION:	Maryland Statewide
PARTNERS:	Maryland State Highway Administration (MSHA), FHWA
START DATE:	1993
END DATE:	1995
DESCRIPTION:	CHART is Maryland's statewide transportation management program. This specific study is to develop a CHART strategic plan. Two areas that will receive emphasis are traffic management strategies and communications alternatives. The effort will initially concentrate on congestion management in the Baltimore-Washington corridor. Both current and future needs will be evaluated, including the application of IVHS technologies and services.
STATUS:	A contract that includes a number of CHART activities including this study has been awarded to JHK & Associates.
ESTIMATED TOTAL PROJECT COST:	To be determined.
ANTICIPATED TOTAL FEDERAL SHARE:	To be determined.
FEDERAL FUNDS THROUGH FY 93:	$250,000
CONTACT:	Sylvia Grijalva, FHWA, MD Division, (410) 962-4440 Mike Zezeski, Maryland State Highway Administration, (410) 787-5860

NEW JERSEY SIGNAL COMPUTERIZATION

LOCATION:	New Jersey
PARTNERS:	FHWA, New Jersey Department of Transportation (NJDOT)
START DATE:	1992
END DATE:	1995
DESCRIPTION:	Two projects will provide coordinated signal systems on Route 18 and Route 73 utilizing advanced traffic control software and video surveillance.
STATUS:	Both projects are under construction and will be operational in 1995. The Route 18 project will incorporate OPAC algorithm software.
ESTIMATED TOTAL PROJECT COST:	$10,200,000
ANTICIPATED TOTAL FEDERAL SHARE:	$6,000,000
FEDERAL FUNDS THROUGH FY 93:	$6,000,000
CONTACT:	Jonathan McDade, FHWA Region 1, HPP-01, (518) 472-4253 Gary Corino, FHWA New Jersey, Division, (609) 989-2274 Gerard Kerwin, New Jersey DOT, (609) 530-2600

SOUTHERN STATE PARKWAY

LOCATION: Long Island, N.Y.

PARTNERS: New York State DOT, FHWA

START DATE: September 1993

END DATE: To be determined.

DESCRIPTION: This project is closely aligned with the INFORM project, which is now operating within Long Island. It is expected that surveillance, control and traveler information techniques will expand on those currently used in INFORM to take advantage of state-of-the-art hardware/software systems. The State will be initiating the project with an investigation into how this project should be coordinated with INFORM, along with opportunities to tie the management system into facilities which approach the I-95 corridor at the western end of Long Island.

STATUS: This project was directed to receive funding in the FY 1992 and 1993 U.S. DOT Appropriations Bill. Funds have been obligated to support conduct of a feasibility and conceptual design study. In addition, a portion of the funds are being used to support work by the Brookhaven National Laboratory on Long Island on a congestion prediction study.

ESTIMATED TOTAL PROJECT COST: To be determined.

ANTICIPATED TOTAL FEDERAL SHARE: To be determined.

FEDERAL FUNDS THROUGH FY 93: $2,800,000

CONTACT: Jonathan McDade, FHWA Region 1, HPP-01, (518) 472-4253

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Department of Transportation IVHS Projects

Key:

(R) Research and Development
(OT) Operational Test
(D) Deployment
(DS) Deployment Support
(NC) National Compatibility Planning
(PA) Program Assessment
(OR) Other Related Projects

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