Department of Transportation's

INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PROJECTS BOOK

January 2003

Compiled by:

U.S. Department of Transportation
Intelligent Transportation Systems (ITS) Joint Program Office

Federal Highway Administration
Office of Transportation Management
Office of Operations Research and Development
Office of Freight Management and Operations
Office of Transportation Operations

Federal Transit Administration
Office of Mobility Innovation

National Highway Traffic Safety Administration
Office of Associate Administrator for Advanced Research and Analysis

Federal Motor Carrier Safety Administration
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I. INTRODUCTION

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Surface transportation systems in the United States today face a number of significant challenges. Congestion and safety continue to present serious problems in spite of the nation's superb roadway systems. Congestion imposes an exorbitant cost on productivity, costing the nation an estimated $40 billion per year. Vehicle crashes cause another $150 billion burden to the economy, and result in the loss of 41,000 lives annually. Inefficient surface transportation, whether in privately owned vehicles, commercial motor carriers, or public transit vehicles, constitutes a burden on the nation's quality of life through wasted energy, increased emissions and serious threats to public safety.

Intelligent Transportation Systems (ITS), formerly Intelligent Vehicle-Highway Systems (IVHS), offer technology-based solutions to the compelling challenges confronting the nation's surface transportation systems, while concurrently establishing the basis for dealing with future demands through a strategic, intermodal view of transportation. ITS applications offer proven and emerging technologies in fields such as data processing, communications, control, navigation, electronics and the supporting hardware and software systems capable of addressing transportation challenges. While ITS technology applications alone cannot completely satisfy growing transportation needs, they provide the means to revise current approaches to problem solving, and they improve the efficiency and effectiveness of existing systems. When deployed and integrated effectively, ITS technologies will enable the surface transportation system to operate as multimodal, multi-jurisdictional entities providing meaningful benefits, including more efficient use of infrastructure and energy resources, complemented by measurable improvements in safety, mobility, productivity and accessibility.

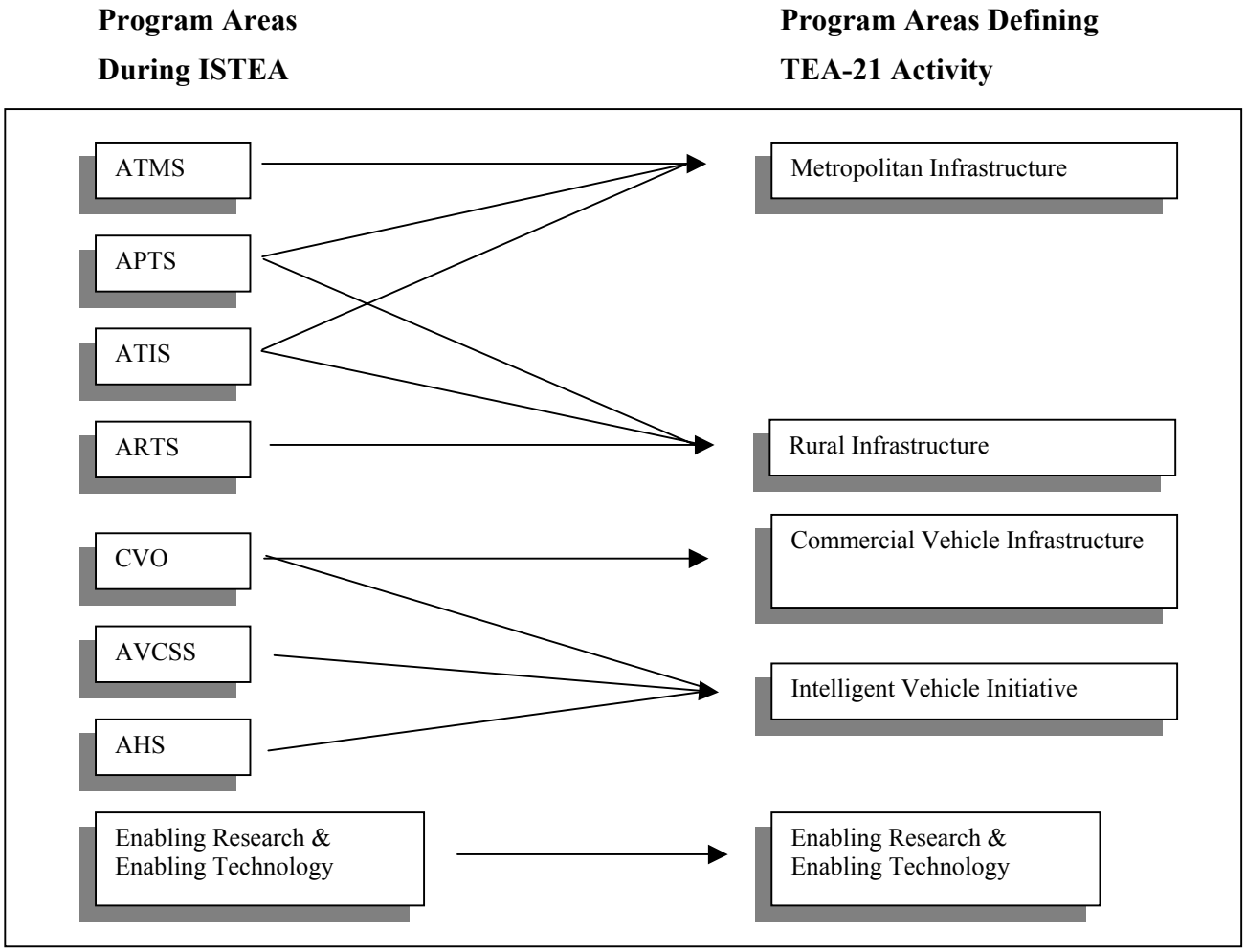
With the enactment of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, Congress set a new course for transportation by mandating increased efficiency and safety on the existing highway and transit infrastructure through increased emphasis on intermodalism - the seamless integration of multiple modes of transportation. In response to ISTEA, the U.S. Department of Transportation (U.S. DOT) initiated a multi-faceted ITS program involving research and field operational testing of promising ITS applications. With the passage of the Transportation Equity Act for the 21st Century (TEA-21) in June 1998, Congress reaffirmed U.S. DOT's role in continuing the development of ITS technologies, and in launching the transition to nationwide, integrated deployment of ITS applications to foster the management of multiple transportation resources as unified systems delivering increased efficiency, safety and customer satisfaction.

Previous editions of this document catalogued ITS projects authorized under ISTEA. The 1999 edition addressed program direction during the transition year in which TEA-21 was enacted - 1998. That edition also addressed the restructuring of the ITS Program from the program areas established during the ISTEA era into the new organization reflecting Congressional direction in TEA-21, which emphasizes deployment and integration of ITS. The advent of TEA-21 catalyzed a restructuring of ITS Program activities into Intelligent Infrastructure categories and the Intelligent Vehicle Initiative. The current edition of this document continues to categorize both legacy projects, originating under ISTEA, and those begun since the enactment of TEA-21, according to this restructured program organization. For continuity and completeness, a brief description of the program realignment is presented in the following narrative.

The program reorientation reflects the evolution of emphasis to deployments whose outputs are infrastructure and/or vehicles. Metropolitan ITS Infrastructure inherits the research in Advanced Traffic Management Systems (ATMS), Advanced Public Transportation Systems (APTS) and Advanced Traveler Information Systems (ATIS). Rural ITS Infrastructure encompasses the activities of the Advanced Rural Transportation Systems (ARTS) Program that includes the application of technologies under development for Metropolitan and Commercial Vehicle Infrastructure that are adaptable to rural community needs. The Commercial Vehicle ITS Infrastructure continues to build on the research endeavors of the Commercial Vehicle Operations (CVO) Program, and is heavily focused on the deployment of Commercial Vehicle Information Systems and Networks (CVISN). The Intelligent Vehicle Initiative (IVI) is focused on facilitating the accelerated deployment of advanced driver assistance systems.

The Enabling Research and Technology program area continues to provide crosscutting support to each of the four functional components comprising the program's foundation. Figure 1 provides a crosswalk depicting the dynamics of the realignment.

Figure 1 - ITS Program Reorientation



The restructured ITS Program places emphasis in two major areas: deploying and integrating intelligent infrastructure, and testing and evaluating intelligent vehicles. Intelligent infrastructure and intelligent vehicles, working together, will provide the combinations of communications, control and information management capabilities needed to improve mobility, safety and traveler decision making in all modes of travel. Intelligent infrastructure comprises the family of technologies which enable the effective operation of ITS services in metropolitan areas, in rural/statewide settings and commercial vehicle applications. Intelligent vehicle technologies foster improvements in safety and mobility of vehicles. The Intelligent Vehicle Initiative embraces four classes of vehicles; light vehicles (ranging from passenger automobiles and vans to light trucks), transit vehicles (buses), commercial vehicles (trucks and interstate buses), and specialty vehicles (emergency response, enforcement and maintenance vehicles).

Within this restructuring, intelligent infrastructure and intelligent vehicle program development objectives are pursued through several program areas: metropolitan ITS infrastructure, rural ITS infrastructure, commercial vehicle ITS infrastructure, and the intelligent vehicle initiative as depicted in figure 2. The application of intelligent infrastructure continues to evolve into additional areas which are achieving recognition as programs. Examples include Intermodal Freight and Public Safety. Advanced information and communications technologies applied across the intermodal system offer important opportunities to strengthen the links between the separate modal systems. U.S. DOT's Intermodal Freight Program is establishing the bases for applying ITS technologies to help both the public and private sectors bridge the modal interfaces. Public safety and transportation officials recognize that, in spite of great advances in emergency services in recent years, applying information technologies to incident prevention, detection, response and management can yield great benefits.

Figure 2

INTELLIGENT INFRASTRUCTURE
• Metropolitan • Rural/Statewide • Commercial Vehicle

INTELLIGENT VEHICLES
• Light • Transit • Trucks • Emergency & Specialty Vehicles

The metropolitan ITS infrastructure program area is focused on deployment and integration of technologies in that setting. The rural ITS infrastructure program area emphasizes deployment of high potential technologies in rural environments. Commercial vehicle ITS infrastructure program objectives are directed at safety and administrative regulation of interstate trucking. Intelligent vehicle program objectives are centered on in-vehicle safety systems for all classes of vehicles in all geographic environments.

There are no specific ITS applications which hold the potential for addressing all of the current or projected transportation system needs. The potential for success lies in developing a national transportation system incorporating integrated and interoperable ITS services. The ITS Program envisions a gradual and growing interaction between infrastructure and vehicles depicted in figure 2 to produce increased benefits in mobility and traveler safety.

The documents guiding ITS Program direction are evolving. As previously noted, the enactment of TEA-21 reflects Congressional reaffirmation of the role U.S. DOT will exercise in advancing the continued development and integrated deployment of ITS technologies. U.S. DOT's goals, key activities, and milestones for fiscal years (FY) 1999 through 2003 are documented in the National Intelligent Transportation Systems Program Plan – Five-Year Horizon dated August 2000. This five-year plan was complemented by the publication in January 2002 of the National Intelligent Transportation Systems Program Plan: A Ten-Year Vision prepared by the Intelligent Transportation Society of America (ITS-A) in cooperation with U.S. DOT.

In September 2002, ITS-A and U.S. DOT published a supplement to the National ITS Program Plan: A Ten-Year Vision titled Homeland Security and ITS (Using Intelligent Transportation Systems to Improve and Support Homeland Security). The Ten-Year Vision prescribes a broad set of policy, program and research activities, including necessary institutional reforms, enabled by ITS technologies, designed to advance the safety, security and efficiency of the surface transportation system.

These documents satisfy Congressional direction in TEA-21 to update the National ITS Program Plan published in 1995, and address ITS deployment and research challenges for stakeholders at all levels of government and the private sector.

Within the restructured framework, the ITS Program is focused on activities impacting both near term and long term horizons.

Near Term. Through the end of FY 2003, the effective period of TEA-21, the program will focus on facilitating integrated deployment of ITS components in the defined infrastructure categories.

- **Metropolitan ITS Infrastructure** will integrate various components of advanced traffic management, traveler information, and public transportation systems to achieve improved efficiency and safety and providing enhanced information and travel options for the public.

- **Commercial Vehicle ITS Infrastructure** is oriented on integrating technology applications for improving commercial vehicle safety, enhancing efficiency and facilitating regulatory processes for the trucking industry and government agencies. The principal instrument of this component is known as **Commercial Vehicle Information Systems and Networks** (CVISN), a system of information systems that link the nodes supporting communications among carriers and agencies.

- **Rural ITS Infrastructure** is characterized by a framework of seven development tracks such as Surface Transportation Weather and Winter Mobility and Rural Transit Mobility. ITS technologies are demonstrating exceptional effectiveness and customer acceptance in such applications that are tailored to rural transportation settings.

The development of a robust market fueled by private sector investment is dependent on a critical mass of basic ITS infrastructure. While in the era of ISTEA, the National ITS Program focused principally on research, technology development, and field testing, the focus of TEA-21 will continue this legacy by building on successes to deploy ITS infrastructure.

A critical challenge in achieving a seamless, intermodal transportation system is ensuring interoperability through the use of the National ITS Architecture and the adoption of open, non-proprietary ITS standards.

U.S. DOT is employing several strategies to address the challenges confronting successful deployment and integration of ITS infrastructure and the development of intelligent vehicles:

- Accelerating the development of standards;
- Providing ITS training and education to enhance knowledge, skills and abilities;
- Conducting research in infrastructure and vehicle technologies;
- Providing ITS deployment guidance and technical assistance;
- Providing assistance and conducting workshops to support achieving consistency with the National ITS Architecture and Standards;
- Showcasing the benefits of integration in modal deployments;
- Evaluating the program.

Long Term. The long-term focus will be directed at supporting research, development and testing of advanced technologies demonstrating potential for deployment in the five-to-twenty-year horizon. The in-vehicle component of this effort will be consolidated into a single *Intelligent Vehicle Initiative* centered heavily on applying driver assistance and control intervention systems to reduce vehicle crashes. A companion effort seeks to integrate driving assistance and motorist information functions to facilitate information processing, decision making and more effective vehicle operation.

This document describes ITS projects, tests, and studies initiated through September 30, 2002, that partially or totally have been financed from Federal ITS funds. Projects identified as "Other" were earmarked activities originating during the period of ISTEA authorization. Projects identified as "Deployment/Integration" were initiated under TEA-21, and represent Congressionally-directed activities appropriated in the ITS Deployment Program. However, the Completed Projects sections, which are located at the end of each chapter, include projects that were actually finished as of September 30, 2002, plus those projects anticipated to be completed by the end of December 2002. The purpose of this report is not to account for all Federal funds made available for ITS activities, but rather to describe all major projects, tests, and studies for each ITS program area. On-going projects are presented in groupings by project type in each infrastructure category and subcategory or program area. The order of presentation, to the extent that current project activity allows, starts with research and development, followed by field operational tests, and concludes with deployments. The completed projects are displayed alphabetically without regard to type.

Throughout this report, U.S. DOT administrations are identified as follows: FHWA—Federal Highway Administration; within FHWA the Turner-Fairbank Highway Research Center (TFHRC) is the focal point for research; FRA—Federal Railroad Administration; FTA—Federal Transit Administration; and NHTSA—National Highway Traffic Safety Administration. Effective January 1, 2000, the Federal Motor Carrier Safety Administration (FMCSA) was activated and assumed sponsorship of Commercial Vehicle Operations projects as well as the truck platform activities of the IVI Program. Although these organizations may not be explicitly listed as partners in projects, it is understood that at least one U.S. DOT administration is involved in each partnership for projects operating with partnership arrangements.

II. METROPOLITAN ITS INFRASTRUCTURE

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The nation's metropolitan areas are confronted with ever-increasing challenges to mobility. The past decade experienced a 30 percent increase in metropolitan area traffic and its accompanying impacts. Projections for near and mid-term increases in the volume of vehicles on the nation's road system reflect a steep rise on the order of 50 percent in the next ten years. This growth is taking place as transportation budgets are being constrained. State and local governments are struggling with the demands these increases place on our infrastructure. If there were a sudden infusion of funding, it is clear that the shortages of space to expand or build new roadways would compromise the viability of those alternatives. Transit providers are facing similar hurdles with budget reductions at a time when transit use is increasing, and expecting better and more reliable service. In year 2000, public transportation ridership increased for the fifth straight year, representing an increase of 20 percent since 1995.

ITS present new approaches to addressing the challenges of metropolitan mobility. Those advocating the application of ITS technologies view urban transportation as a comprehensive, seamless system which should be managed as a whole with an intermodal and unified perspective of regional mobility.

In January 1996, then Secretary of Transportation Federico Pena established a goal of deploying ITS infrastructure in 75 of the nation's largest metropolitan areas within ten years. This goal was reaffirmed by Secretary Slater in 1997, and was expanded to include three additional metropolitan areas. This goal is known as "Operation Timesaver," and is being pursued through the deployment and integration of the components of metropolitan ITS infrastructure. The components of ITS infrastructure in metropolitan settings are summarized as follows:

- **Arterial Management Systems** automate the process of adjusting signals to optimize traffic flow along arterial roadways.

- **Freeway Management Systems** provide information to motorists and detect problems whose resolution will increase capacity and minimize congestion resulting from accidents.

- **Transit Management Systems** enable new ways of monitoring and maintaining transit fleets to increase operational efficiencies through advanced vehicle locating devices, equipment monitoring systems, and fleet management systems.

- **Incident Management Systems** enable authorities to identify and to respond to vehicle crashes or breakdowns with the most appropriate and timely emergency services, thereby minimizing recovery times.

- **Electronic Toll Collection Systems** provide drivers and transportation agencies with convenient and reliable automated transactions, to improve traffic flow at toll plazas and increase the operational efficiency of toll collection.

- **Electronic Payment Systems** enable motorists to pay for parking, bus and train fares, as well as tolls, by using a single smart card.

- **Highway-Rail Intersection Systems** coordinate traffic signal operations and train movements, and notify drivers of approaching trains through in-vehicle warning systems.

- **Emergency Management Systems** are coordinated to ensure the nearest and most appropriate emergency service units respond to a crash.

- **Regional Multimodal Traveler Information** systems provide road and transit information to travelers, businesses, and truckers to enhance the effectiveness of trip planning and en-route alternatives.

- **Information Management Systems** provide for the archiving of data generated by ITS devices to support planning and operations.

- **Integrated Systems** deliver the optimal mix of services in response to transportation system demands.

These components, when integrated by a common communication structure, provide an intelligent transportation infrastructure enabling information access across agency and jurisdictional lines. Such integration substantially improves individual functions, provides synergism, and creates a set of public and private sector-operated services which form the foundation for the evolution of the long-range vision of ITS.

Program objectives in Metropolitan ITS Infrastructure activities are pursued through the ITS Travel Management Program. The ITS Travel Management Program supports numerous activities to include research, testing and outreach which are directed at advancing the integrated deployment of ITS infrastructure components in both metropolitan and rural areas. The Travel Management Program is organized into a series of sub-program areas or "development tracks" which provide programmatic focus for activities leading to the delivery of services.

A very brief summary of the development tracks and their corresponding areas of concentration follows:

- **Arterial Operations and Traffic Control Systems** – Applying and integrating advanced technologies to improve mobility on arterial and other surface streets.

- **Freeway Management Operations** – Using ITS technologies to control freeway operations and improve freeway management systems. Techniques and technologies include freeway monitoring, congestion reduction, improving ramp metering, providing traveler information on route and mode selection.

- **Public Safety** – Advancing law enforcement and emergency medical services. Techniques and technologies include automatic collision notification, enhanced wireless 911 systems, and coordinated incident response.

- **Travel Information** – Deploying and integrating core infrastructure and developing standards needed to support data sharing to satisfy multimodal traveler information needs.

Techniques and technologies include development of requirements for regional and statewide traveler information systems, development of decision support systems to support varied users (e.g., commuters, tourist and transportation system operators), deployment of regional, statewide and multi-state traveler information capabilities, and supporting the implementation of 511.

- **Modeling and Simulation** – Development and application of analytical tools supporting evaluation and/or design of ITS.

- **Crash Prevention** – Preventing crashes and reducing crash severity. Techniques and technologies include variable speed limit systems and development of infrastructure based on crash avoidance warning systems.

- **Transit Fleet Management** – Supporting transit agencies through efforts to enable optimization of routing and scheduling vehicles to improve service and reduce costs. Techniques and technologies include development of demand-response algorithms, and development of fleet expert systems to automate service restoration during disruptions.

- **Transportation Service Coordination** – Improved access to transportation services for mobility-impaired citizens through transit/paratransit system management and referrals to services. Techniques include improving utilization of transit agency resources, improving information delivery for transit/paratransit customers, improving reliability and timeliness of services, and coordinating transportation services among multiple transportation organizations.

- **Highway Operations and Maintenance** – Improving efficiency and capabilities of transportation system maintenance operations. Techniques and technologies include applying ITS technologies in work zone activities, enhancing maintenance and safety of public vehicle fleets, and coordinating information among modes.

- **Surface Transportation Weather and Winter Mobility** – Developing improved road weather information systems and maintenance strategies for winter mobility. Techniques and technologies include building cohesive relationships between meteorologists and transportation professionals, developing decision support systems, developing technologically advanced maintenance practices, and improving road weather management strategies.

- **ITS Planning** – Increasing awareness of ITS capabilities among transportation planners at all levels, and among various modes of travel. Outreach techniques include conducting workshops, providing guidance, and promoting regional and statewide multimodal transportation planning.

- **Archived Data User Service** – Promoting the use of archived data to support transportation system decision making. Techniques include supporting the deployment of integrated systems which fuse information from multiple ITS data sources.

- **ITS Deployment** – Providing technical assistance resources to deploying entities. Techniques and forms of assistance include service plans, the peer-to-peer program, guidance documents and the Professional Capacity Building Program.

Detailed information on the Travel Management Program may be found at the ITS Joint Program Office Web site at http://www.its.dot.gov/TravelManagement/Travel.htm.

The ITS technologies comprising metropolitan infrastructure advanced significantly during the period of ISTEA authorization. The emphasis on research and operational testing in this timeframe was heavily focused on the problem areas severely impacting metropolitan areas: safety, congestion, and mobility. In numerous cases, systems deployed in the operational test program have resulted in quantifiable benefits, and have been incorporated as permanent elements of their areas' transportation systems.

Deployment tracking results reveal that numerous regions throughout the Nation have deployed one or more of the elements of metropolitan infrastructure. The potential for maximizing benefits of intermodal management and delivery of additional services lies in successful technical integration and interjurisdictional coordination of these elements.

The projects described in the following sections have, and are, contributing to an enhanced capability to provide integrated user services. As noted in the introduction to this document, the ITS Program has been reoriented to reflect the transition to an emphasis on integrated deployment. Projects retain their identities as research and development, operational tests and deployment/integration (also identified as "other" if initiated prior to June 1998, the date TEA-21 was enacted), but they have been grouped by element in the classification structure consisting of intelligent infrastructure and intelligent vehicles. In many cases, projects cut across more than one intelligent infrastructure element such as arterial management system projects which include major traveler information aspects and/or linkages to transit properties. The categorization of projects was made with full acknowledgment that some projects might have been categorized differently. The Integrated Programs, Metropolitan Model Deployment Initiatives, and several of the Congressionally directed-earmarked-Deployment/Integration projects funded under the ITS Integration Program in TEA-21 inherently encompass multiple infrastructure elements.

Achieving this vision of integrated deployment will require successful completion of several key research and development efforts, testing of sensor technologies, control systems, and the integration of these systems in addition to continued support for widespread deployment of Metropolitan ITS Infrastructure in metropolitan areas across the nation. Building on the legacy of ISTEA and TEA-21, the future direction for Metropolitan ITS Infrastructure points toward continued deployment and a special focus on integration. The success of Metropolitan ITS Infrastructure hinges, to a great extent, on integrating traffic management systems, advanced public transportation systems and advanced traveler information systems.

Many research and development projects and operational tests have brought advances in understanding the approaches to, and benefits of, integrating Metropolitan ITS Infrastructure. The culmination of this effort was the establishment of the Metropolitan Model Deployment Initiative Program in which four sites were selected to become deployment showcases of fully integrated, Metropolitan Intelligent Transportation Infrastructure. These model deployments

demonstrated the benefits of integrated transportation management systems featuring effective regional, multimodal traveler information services.

One of the unique advances fostered by the ITS Program is innovation in collecting and distributing expanded information for both "pre-trip" and "en-route" travelers. One of the goals of this effort is to increase availability of real-time and current status of transit information. In many cases, these travel information systems are multimodal, providing both roadway and transit system performance information. These sources of information enable travelers to make informed choices based on up-to-date relevant data. These capabilities can also support personal and public agency efforts to reduce demand and increase vehicle occupancy.

A key feature of many regional travel information projects is the participation of private sector companies interested in marketing traveler information. The creation of viable public-private partnerships in these projects is highly valuable, and the eventual success of such partnerships is a key goal of deployment.

The ITS Program for Public Transit encompasses a number of technologies aimed at increasing the use, operational efficiency and cost effectiveness of the services provided by public transit agencies. The scope of these operations nationwide includes approximately 6,000 agencies operating more than 100,000 vehicles. These operations support more than 9 billion trips annually.

The Advanced Public Transportation Systems applications have been developed principally to support the needs addressed in three components of the Metropolitan ITS Infrastructure: Transit Management Systems, Regional Multimodal Traveler Information, and Electronic Payment Systems. The functional applications encompassed by these components are Fleet Management, Transit Traveler Information, and Electronic Payment Systems.

Fleet Management Systems are primarily directed at improving the operations and productivity of transit agencies and the safety of their passengers. Transit Traveler Information utilizes several technologies for the dissemination of transit information that facilitates and encourages the use of public transportation. Electronic Payment Systems focus on integrating transportation payment systems to improve traveler convenience and reduce operating costs.

The operational tests described in the Metropolitan ITS Infrastructure section, focused on Transit Management, encompass the technologies addressed above. These operational tests were designed to evaluate varying technologies in terms of their effectiveness in improving transit operations and evaluating the consumer acceptance and benefits of a variety of techniques to encourage the use of transit.

In addition to operational tests, there have been a number of full-scale deployment projects employing ITS technologies. These have been concentrated in Fleet Management Systems derived from earlier operational test/deployment results and the Federal Transit Administration's research and development program.

Of 572 transit agencies surveyed in 2000, over one-half had deployed automated transit information and over 40 percent had deployed advanced communications. An increasing number of transit agencies either have, or are in the process of deploying fleet management systems. The motivation for these initiatives is found in the significant benefits to be derived in improved passenger safety, reduced operating costs, and improved customer service resulting from enhanced schedule adherence. Transit agencies are continuing to deploy ITS transit technologies. It has been estimated that the projected benefits of all ITS transit deployments that are currently operational, under implementation or planned for deployment over the next ten years are valued at $6.7 billion. Some operational tests build on deployed automatic vehicle location systems to reap the benefits of integration with sources of traveler information, traffic management centers, and other components of metropolitan infrastructure.

Another important activity in many transit properties, including several operational tests, is to test new ways of giving the traveling public transit information. Transit operators are well aware that the traditional printed schedule is difficult to read and a disincentive to the use of public transit. A wide variety of techniques are being tested to determine how to communicate to the public and to increase the number of people using transit. These technologies span a broad range of approaches because one technique will not serve all segments of the riding public.

Effective implementation of travel management improvements through use of ITS cannot be fully achieved by implementing stand-alone projects. Especially in metropolitan areas, an integrated program of linked, complementary projects covering areas such as traffic control, freeway and incident management, transit management, and traveler information is necessary to maximize benefits while minimizing costs. Transit operators are striving to provide customers and potential customers reliable, accurate, and timely information. To date, several of these integrated programs have been supported with Federal ITS funds, as described in this chapter under "Integrated Programs." These programs are more comprehensive in scope, size, and objectives than individual projects.

Corridors

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) set forth criteria for the establishment of ITS Priority Corridors. Priority Corridors were defined as having traffic density above the national average, severe or extreme ozone non-attainment, a variety of transportation facilities, and an inability to significantly expand capacity. U.S. DOT designated four priority corridors:

- the I-95 Corridor (including Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Virginia);
- the Midwest Corridor (Gary, Indiana, to Milwaukee, Wisconsin);
- Houston, Texas Corridor; and
- Southern California (Los Angeles to San Diego).

The organizations sponsoring development of these corridors established business plans and initiated extensive programs comprised of deployment projects, focused field operational tests, and other

activities tailored to the transportation needs of the respective areas. These programs fostered development of integrated transportation management and traveler information systems incorporating a wide range of ITS technologies and services. Additionally, institutional relationships developed and strengthened through the Priority Corridors Program have led to enhanced working relationships among traffic, transit, and other transportation entities across jurisdictional boundaries.

The enactment of the Transportation Equity Act of the 21st Century (TEA-21) did not extend the ITS Priority Corridors Program. The legislation does provide for multi-year funding streams for categories identified as Northeast ITS Implementation and Great Lakes ITS Implementation. These recurring TEA-21 Congressional Earmarks have fostered the continued development of ISTEA-era corridor projects as well as new initiatives contributing to intermodal and integrated transportation system capabilities. The Northeast ITS Implementation funding is managed under the auspices of the I-95 Corridor Coalition.

Model Deployment Initiatives

To support moving ahead with greatly expanded deployment of ITS using regular Federal-aid and other state/local funding, the U.S. DOT initiated the Model Deployment Initiative. The metropolitan area Model Deployment Initiatives were intended to support integrated transportation management systems, and feature a strong, regional, multimodal traveler information services component. These model deployment sites demonstrated and showcased the measurable benefits resulting from the application of an integrated, region-wide approach to transportation management and the provision of traveler information services. The model deployment sites provided improved transportation management and increased levels of service to the traveling public, businesses, and commercial carriers through the integration of the traditional functions of traffic signal control; transit, freeway, and incident management; emergency services management; regional, multimodal traveler information services; and electronic toll and fare payment. In addition to introducing the public to the benefits of ITS products and services, the sites continue to serve as "showcases" for key local decision makers across the U.S., and support peer-to-peer interaction and seminars focused on the benefits of ITS infrastructure investments by both the public and private sectors. The model deployment sites also provide a setting for conducting rigorous evaluations of the benefits of an integrated metropolitan area ITS infrastructure.

The final synthesis report summarizing the lessons learned from the evaluations of the Metropolitan Model Deployment Initiative sites was released in February 2002. The document titled "Deploying and Operating an Integrated Intelligent Transportation System: Twenty Questions and Answers" in addition to summarizing lessons learned from the extensive evaluations conducted at MMDI sites, the document takes a unique look at the status and direction of the deployments five years after the inception of the program.

The TEA-21 ITS Deployment Program

A major component of TEA-21 is the Intelligent Transportation Systems Deployment Program. The ITS Deployment Program is comprised of two subprograms: The ITS Integration Program and the Commercial Vehicle Infrastructure Program. The ITS Integration Program's goal is to increase integration and interoperability of Intelligent Transportation Systems in metropolitan and rural areas. Deployment/Integration projects with start dates late in fiscal years 1998, 1999, 2000, 2001, and 2002

are ITS Integration Program projects. In addition to the project definitions discussed above, projects will be grouped under statewide and/or regional integration categories. In cases where ITS integration projects do not cover wide geographic areas, they are categorized as individual projects under Integrated Systems.

The Commercial Vehicle Infrastructure Program is aimed at improving the safety and productivity of commercial vehicles and drivers, as well as reducing the costs associated with Federal and state regulatory requirements.

As authorized in TEA-21, the ITS Deployment Program is a discretionary program to be competitively awarded to states and local jurisdictions. However, each year since the enactment of TEA-21, Congress has designated areas to receive ITS Deployment Program funding as part of the annual appropriations process. While U.S. DOT does not advocate the "earmarking" of the ITS Deployment Program, the Department has established an oversight process to ensure that these funds are used in compliance with the requirements of TEA-21.

The National ITS Program has tailored the eight ITS Program strategies used to achieve ITS Program goals to the deployment of integrated ITS infrastructure. These eight strategies are discussed in detail in The National Intelligent Transportation Systems Program Plan – Five Year Horizon, and summarized below:

Conducting Research – U.S. DOT is conducting research on the next generation of traffic and transit management technologies. Examples of technical applications being pursued include adaptive control systems that change signal timing in response to traffic conditions, dynamic control systems which rely on historical patterns to predict traffic conditions and optimal regional management. A major undertaking is in the development of modeling and analytical tools to support transportation planning. Transit management research is oriented on fleet management systems, electronic fare payment, and traveler information for transit operations.

Accelerating the Development of Standards – Of the many standards with potential application in metropolitan settings, two are exceptionally important - the National Transportation Communications for ITS Protocol (NTCIP), and the Transit Communications Interface Profiles (TCIP). NTCIP is a family of standards that allow transportation system managers to monitor, control, and manage roadway devices ranging from traffic signals to ramp meters. TCIP provides interfaces among transit applications that enable data sharing among transit agencies and other transportation system facilities such as regional traffic management centers. Through a combination of approaches, ranging from outreach to stakeholders to conducting research and testing activities, U.S. DOT is supporting the accelerated development of ITS standards to assist sites migrating from legacy systems to new systems incorporating ITS standards.

Building Professional Capacity – The Professional Capacity Building (PCB) program provides an opportunity for those agencies and individuals who are involved with ITS to enhance knowledge, skills and abilities. The PCB program presents a synergy of training, education, technical assistance and information outreach that can be effectively utilized to advance ITS metropolitan infrastructure deployment and integration. The PCB program offers a wide range of courses that address various aspects of the deployment process as well as a variety of institutional, technical, modal (transit, commercial vehicle, etc.) and geographical (metropolitan to rural) aspects. New courses are

constantly being added to the PCB curriculum and existing courses are regularly updated. The PCB program continues to work with the National Highway Institute (NHI), the National Transit Institute (NTI), the Consortium of ITS Training and Education (CITE), Institute of Transportation Engineers (ITE), ITS America (ITSA) and others to broaden and strengthen the ITS curriculum, as well as to enhance the accessibility of training, technical assistance and information.

Creating Funding Incentives – As authorized in TEA-21, the ITS Deployment Program is a discretionary program to be competitively awarded to the states and local jurisdictions. Each year since the enactment of TEA-21, Congress has designated areas to receive ITS Deployment Program funding as part of the annual appropriations process. U.S. DOT has established an oversight process to ensure that these funds are employed in compliance with the intent and requirements of TEA-21.

Providing Guidance and Technical Assistance – U.S. DOT provides specialized technical support to jurisdictions planning to deploy integrated ITS through its Federal field staff, through publication of guidance documents on best practices for ITS metropolitan deployment, and with the Peer-to-Peer Network. This network, which allows stakeholders to learn about ITS implementation from one another, is comprised of professionals from the private and public sector who are on call to provide short-term, no-cost technical assistance to transportation colleagues throughout the nation.

Ensuring Conformance with the National ITS Architecture and Standards – Interim guidance for ensuring National ITS Architecture and Standards conformance was disseminated in 1999, but has now been superseded by a rule that requires the development of regional ITS architectures. The rulemaking process culminated in January of 2001 with both a Rule (FHWA) and a Policy (FTA) that addresses the TEA-21 requirement that ITS projects funded through the highway trust fund conform to the National ITS Architecture and applicable standards. Regional ITS architectures help guide the integration of ITS components and ensure that all are compatible with one another and with future ITS projects. In addition, the Rule and Policy require the use of U.S. DOT-adopted ITS standards as appropriate. However, no ITS standards have been adopted by the U.S. DOT to date.

Evaluating the Program – Program evaluation is essential for understanding the value and effectiveness of ITS implementation and for measuring progress toward deployment goals. Tracking the deployment of metropolitan ITS infrastructure complies with the Government Performance and Results Act and fosters continual refinement of both the National ITS Program and the metropolitan ITS component. A significant number of metropolitan ITS field operational tests, upon completion, have contributed findings into the ITS cost and benefits databases. A significant source of information about the impacts of ITS deployments are the evaluation results of the Metropolitan Model Deployment Initiatives.

TEA-21 projects conducted under the ITS Deployment Program are being evaluated through mandatory self-evaluations conducted by resources within their project management teams. A limited number of these projects will be evaluated each year of TEA-21 authorization by evaluation teams contracted by the ITS Joint Program Office (ITS JPO). These JPO-funded evaluations are conducted on projects judged to provide lessons learned and benefits information in areas where the ITS Program has compelling information needs, and has, to date, accumulated only limited data. Evaluation results from these projects will make major contributions to ITS cost and benefits databases.

Showcasing Benefits – Under ISTEA, U.S. DOT financed model deployment sites in four metropolitan areas around the country to provide real-life examples of ITS potential and to demonstrate the benefits of integration. The four sites – Phoenix, Seattle, San Antonio, and the New York/New Jersey/Connecticut metropolitan area – continue to showcase the benefits of metropolitan ITS technologies under TEA-21. These sites have brought together public and private sector partners to integrate existing infrastructure with new traveler information systems. They have deployed and integrated applications for managing traffic and transit, for integrating emergency services, and for providing real-time transportation information to travelers. (See Model Deployment Initiatives.)

Results from the Metropolitan Model Deployment Initiative sites will be combined with evaluation findings in the TEA-21 ITS Integration Program evaluations, both the self-evaluations and the JPO-sponsored evaluations, to develop products documenting the benefits of integrated deployments of metropolitan ITS infrastructure.

Arterial Management Systems

ADAPTIVE CONTROL SOFTWARE (ACS) "LITE"

Description: The objective of the ACS Lite project is to provide adaptive control of traffic signals through existing closed-loop systems to meet the needs of traffic agencies operating closed loop systems. The ACS Lite project will focus on current already existing closed loop systems and enhance the master controllers selection to provide a signal-timing plan optimized for the network's current condition. This will be done by developing an ACS Lite prototype that will analyze the detector data from the intersections part of the closed loop system and create an optimized timing plan for the current traffic demands. The optimized timing plans will be sent by the ACS Lite prototype to the master controller, which will transfer these plans to the local controllers for implementation. This project will also focus on making maximum use of the infrastructure of the existing traffic control systems.

Project Location: Virginia

Contractor(s): Siemens-Gardner Transportation Systems, NEMA Manufacturers

Start Date: February 2002

***End Date*:** October 2003

Estimated Total ITS Funds: $998,943

Estimated Total Project Cost: $998,943

***Contacts*:**

Felipe Luyanda-Andino	FHWA - TFHRC, HRDO-04	(202) 493-3368

ARIZONA CENTER FOR TRAFFIC AND LOGISTICS ALGORITHMS & SOFTWARE (ATLAS)

Description:

The Arizona Center for Traffic and Logistics Algorithms and Software (ATLAS) is a center of excellence specializing in research development of algorithms, software and systems which advance the state of the art and the state of the practice in traffic management and logistics management systems.

Faculty members have developed innovative methods for logistics management, such as scheduling resources (trucks, cranes, containers, storage space, etc.), designing networks, siting facilities, routing and scheduling vehicles (trucks, buses, cargo ships, etc.), and designing decision-support systems. In the advanced traffic management area, the university's showpiece research is the development and deployment of RHODES (Real-Time Hierarchical Optimized Distributed Effective System), an innovative computer-based system for traffic-adaptive signal control. In laboratory testing, RHODES, which is the first system of its type developed in the United States, proved to be among the most effective traffic control systems dealing with congestion.

Project Location: Tucson, Arizona

Partner(s): University of Arizona

Start Date: August 1998

***End Date*:** January 2003

Estimated Total ITS Funds: $1,272,500

Estimated Total Project Cost: $1,272,500

***Contacts*:**

Alan Hansen	FHWA Arizona Division, HPR1-AZ	(602) 379-3645	Ext. 108
David Gibson	FHWA - TFHRC, HRDO-04	(202) 493-3271	
Pitu Mirchandani	University of Arizona	(602) 621-6551	

ATMS RESEARCH AND DEVELOPMENT

Description: The objectives of this project include maintaining FHWA's Traffic Software Integrated System (TSIS) software, developing a testbed for integrating ATMS technologies, providing technical support to FHWA on projects to advance the state-of-the-art in ATMS, and supporting the laboratory testing of national ITS standards.

Project Location: Colorado Springs, Colorado

Contractor(s): ITT Industries, Inc.

Start Date: May 2001

***End Date*:** May 2006

Estimated Total ITS Funds: $6,480,825

Estimated Total Project Cost: $6,480,825

***Contacts*:**

Raj Ghaman	FHWA - TFHRC, HRDO-03	(202) 493-3270

INTEGRATED RAMP METERING/ADAPTIVE SIGNAL CONTROL

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, the new Advanced Traffic Controller, and an adaptive control algorithm (OPAC).

Project Location: Irvine (Orange County), California

Partner(s): California DOT (CalTrans), City of Irvine, Farradyne Systems, and University of California - Irvine

Start Date: September 1993

***End Date*:** March 2003

Estimated Total ITS Funds: $2,617,000

Estimated Total Project Cost: $3,271,250

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(916) 498-5005
John Thai	City of Irvine, CA	(949) 724-7311

NORTH SEATTLE ADVANCED TRAFFIC MANAGEMENT SYSTEM

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.

Project Location: North Seattle, Washington

Partner(s): Washington State DOT

Start Date: July 1993

***End Date*:** September 2003

Estimated Total ITS Funds: $3,500,000

Estimated Total Project Cost: $4,375,000

***Contacts*:**

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Ghadeer Baghai	Washington State DOT	(206) 440-4446

PEDESTRIAN SAFETY ENGINEERING & ITS-BASED COUNTERMEASURES PROGRAM FOR REDUCING PEDESTRIAN FATALITIES, INJURIES, CONFLICTS, & OTHER SURROGATE MEASURES-FLORIDA

Description: The FHWA seeks to implement Cooperative Agreements to demonstrate and evaluate the effectiveness of a combined pedestrian safety engineering, and Intelligent Transportation System (ITS) based area-wide countermeasures program. Phase I of the Cooperative Agreement develops a plan addressing pedestrian safety problem identification and countermeasure selection. Phase II consists of implementing the plan. The intent of the Cooperative Agreement is (i) to demonstrate the effectiveness of the pedestrian safety countermeasures in reducing pedestrian fatalities, injuries, and conflicts, and (ii) to demonstrate the plan's portability to other jurisdictions within the United States.

Project Location: Florida

Partner(s): FHWA, University of Florida

Start Date: September 2001

***End Date*:** August 2005

Estimated Total ITS Funds: $400,000

Estimated Total Project Cost: $825,000

***Contacts*:**

Tamara Broyhill	FHWA Safety-HSA	(202) 366-4077	
Mike Freitas	FHWA ITS JPO, HOIT	(202) 366-9292	
Leverson Boodlal	ORNL	(202) 366-8044	
Ron Van Houten	University of Florida	(902) 434-6274	
Charles Wallace	University of Florida	(352) 392-7575	Ext. 1450

PEDESTRIAN SAFETY ENGINEERING & ITS-BASED COUNTERMEASURES PROGRAM FOR REDUCING PEDESTRIAN FATALITIES, INJURIES, CONFLICTS, & OTHER SURROGATE MEASURES-NEVADA

Description: The FHWA seeks to implement Cooperative Agreements to demonstrate and evaluate the effectiveness of a combined pedestrian safety engineering, and Intelligent Transportation System (ITS) based area-wide countermeasures program. Phase I of the Cooperative Agreement develops a plan addressing pedestrian safety problem identification and countermeasure selection. Phase II consists of implementing the plan. The intent of the Cooperative Agreement is (i) to demonstrate the effectiveness of the pedestrian safety countermeasures in reducing pedestrian fatalities, injuries, and conflicts, and (ii) to demonstrate the plan's portability to other jurisdictions within the United States.

Project Location: Nevada

Partner(s): FHWA, Regents UCCSN-University of Nevada (Las Vegas)

Start Date: September 2001

***End Date*:** August 2005

Estimated Total ITS Funds: $400,000

Estimated Total Project Cost: $873,172

***Contacts*:**

Tamara Broyhill	FHWA Safety-HSA	(202) 366-4077
Mike Freitas	FHWA ITS JPO, HOIT	(202) 366-9292
Leverson Boodlal	ORNL	(202) 366-8044
Shasti Nambisan	University of Nevada	(702) 895-1325

ASHLAND AVENUE TRAFFIC SIGNAL INTEGRATION

Description:

This is a discretionary project of the FY2000 ITS Deployment Program for Chicago, Illinois.

GOALS AND OBJECTIVES

The goals of this project are to improve safety and efficiency for a 1½ mile segment of the Ashland Avenue Corridor. This is to be accomplished with the installation of new underground fiber optic cable and updated traffic signal equipment. Integrated traffic signal systems with modernized controllers fulfill the City of Chicago's Traffic Signal Master Plan by incorporating a core infrastructure that can take advantage of emerging ITS technologies, including bus transit and emergency vehicle priority. The proposed transportation communications and traffic signal infrastructure will serve various functions in the planned integration of the City of Chicago's traffic signal communications system with other agencies. This project will further encourage inter-jurisdictional coordination and reduce institutional barriers. This is further detailed in the following Scope of Work.

SCOPE OF WORK

The signal equipment at Ashland Avenue and 91st Street will be replaced with a modernized signal. The signal controllers and signal cabling at 95th, 91st, 87th, 85th, and 83rd Streets will be replaced and a telephone connection will be made to the system to permit communication with computer work stations at the Chicago Department of Transportation Bureau of Traffic and the Department of Streets and Sanitation Bureau of Electricity. All upgraded signals for this project permit future integration with bus transit and emergency vehicle priority. Failure reports and alarms will automatically be sent to the Bureau of Electricity, alerting them of any malfunctions on this system, thus improving response to signal maintenance needs.

Project Location: Chicago, Illinois

Partner(s): FHWA, Illinois DOT, Chicago DOT, Chicago Department of Streets and Sanitation - Bureau of Electricity

Start Date: July 2001

***End Date*:** May 2005

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $1,572,842

***Contacts*:**

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
David Zavattero	Illinois DOT	(847) 705-4800

ATMS EXPANSION IN THE I-390 CORRIDOR FROM I-490 TO AIRPORT/TRANSPORTATION OPERATIONS CENTER

Description: This project is one of several FY 2001 ITS Integration Program earmarks for the Rochester, New York area. ITS infrastructure deployment has been underway for several years with emphasis on a countywide signal system upgrade, the installation of an Airport/Transportation Operations Center, and the Rochester Advanced Traffic Management System (ATMS). This project includes the design and construction in the next step in the expansion of the Rochester ATMS. Project scope includes deployment of field devices such as Dynamic Message Signs, Highway Advisory Radio, Road Weather Information Systems and Closed Circuit TV Cameras. The project will integrate these devices into the existing ATMS. Project objectives include a reduction in the number of secondary incidents, improved mobility, reduced emergency responder reaction time, and improved traffic diversion management.

Project Location: Towns of Gates and Chili, and Monroe County, New York

Partner(s): FHWA, New York State DOT, Monroe County DOT, New York State Police

Start Date: September 2001

***End Date*:** December 2005

Estimated Total ITS Funds: $550,000

Estimated Total Project Cost: $1,500,000

***Contacts*:**

Jerry Zell	FHWA New York Division - HDT-NY	(518) 431-4125	Ext. 228
James Willer	New York State DOT	(716) 272-3450	

BROOKLYN-BRONX-QUEENS SIGNALIZATION

Description: This project supports the development, installation and evaluation of new, advanced traffic controllers (ATC) for integration into the signal system for New York City's five boroughs. The project will develop controller prototypes, field test hardware and software, and evaluate system performance before installing additional ATCs at various locations around the City. The development of the controller prototype specification will be completed under the Topics program using $0.2M of city funds. After the specification was completed (March 1999), the city will develop a separate contract to furnish and install the new controllers at approximately 500-1000 intersections. ITS funds will be used for the installation contract.

Project Location: Brooklyn and Bronx, New York

Partner(s): New York State DOT and New York City DOT

Start Date: July 1995

***End Date*:** February 2003

Estimated Total ITS Funds: $3,750,000

Estimated Total Project Cost: $4,687,500

***Contacts*:**

Arthur O'Connor	FHWA New York Division NYC Metro Office	(212) 668-2206
Fred Lai	New York State DOT	(718) 482-4733

COLLEGE STATION, TEXAS

Description:

This project is the FY 2001 ITS Integration Program earmark for College Station, Texas. The purpose of this project is to expand and integrate the transportation management infrastructure in the College Station/Bryan area to enable agencies to improve traffic management during frequent special events. Texas A & M University with its numerous athletic and cultural events attracts frequent increases in traffic on the transportation network. An added factor is a major rail line running through the center of the various traffic generators. The project will accomplish four major components:

- Develop a Regional ITS Architecture and ITS Deployment Plan.
- Upgrade and integration portions of the transportation communications network for the area.
- Integrate traffic signal information and video on several important special event travel routes in the area.
- Enhance the traffic management and information dissemination capabilities for special events through installation of two dynamic message signs on routes leading into the event generating area, and integrate their operations into Texas Transportation Institute's TransLink Laboratory.

Project Location: College Station, Texas

Partner(s): FHWA; Texas DOT; Texas Transportation Institute; Brazos County; Brazos Transit; College Station Urban Transportation Study Steering Committee; Cities of College Station and Bryan; Texas A&M University Parking, Traffic, and Transportation Services

Start Date: September 2002

***End Date*:** September 2005

Estimated Total ITS Funds: $1,428,506

Estimated Total Project Cost: $2,857,012

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Kevin Balke	Texas Transportation Institute	(979) 845-9899

DUPAGE COUNTY MULTI-JURISDICTIONAL SIGNAL COORDINATION PROTOTYPE

Description:

This is a discretionary project of the FY2001 ITS Deployment Program for DuPage County, Illinois.

GOALS AND OBJECTIVES

The primary goal of this project is to improve mobility. This is to be accomplished with the planning, design, implementation, operation, maintenance, and monitoring of two coordinated traffic signal systems to facilitate traffic movement in DuPage County.

The DuPage Multi-jurisdictional Signal Coordination Prototype project will provide for deployment of signal system improvements, follow-up analysis and completion of guidelines for the monitoring, maintenance and operation of multi-jurisdictional signal systems.

The key objective of this project is to overcome institutional issues in order to facilitate widespread integration across jurisdictional boundaries, for the greater efficiency and interoperability of the signalized roadway system.

SCOPE OF WORK

This project will provide for deployment of a new closed loop signal system along St. Charles Road (from Illinois Route 83 to Fair Avenue) in the City of Elmhurst, a fiber optic communications link to an existing adjacent closed loop signal system operated by the Villages of Villa Park and Lombard on St. Charles Road (Westmore-Meyers to Villa Avenue), and integration of a closed-loop signal system for two intersections on Illinois Route 83 that crosses St. Charles Road.

The project also provides for deployment of a new fiber optics communications link between two existing but previously non-integrated closed-loop signal systems on 75th Street (Fort Hill Drive to Millbrook Road and Book Road to Wherli Road) in Naperville. One signal system (Fort Hill Drive to Millbrook Road) is comprised of four intersections and is currently operated by the City of Naperville. The adjacent signal system (Book Road to Wherli Road) is operated by the DuPage County Division of Transportation.

A Part II Prototype Study/Planning Analysis will be conducted as part of this project. Some of the important responsibilities in this task include development of final guidelines for multi-jurisdictional signal coordination operations and monitoring procedures, a benefits assessment of multi-jurisdictional signal coordination for the specific deployment sites, a benefits assessment of multi-jurisdictional signal coordination for County-wide implementation, studying the efficiency and cost-effectiveness of staffing options to perform on-going signal timing, operation and monitoring, and establishment of preferred traffic signal communications systems and hardware standards to enable the use and integration of detectors and related monitoring devices as a future data source for the proposed DuPage Traffic Management Center and the Gateway Traveler Information System.

Project Location: DuPage County, Illinois

Partner(s): FHWA, Illinois DOT, DuPage County Division of Transportation, Cities of Naperville and Elmhurst, Villages of Villa Park and Lombard; and DuPage Mayors and Managers Conference

Start Date: August 2001

***End Date*:** June 2005

Estimated Total ITS Funds: $396,807

Estimated Total Project Cost: $1,424,864

***Contacts*:**

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
David Zavattero	Illinois DOT	(847) 705-4800
Morgan Cotten	DuPage County Division of Transportation	(630) 681-2253

FORT COLLINS ADVANCED TRAFFIC MANAGEMENT SYSTEM

Description: This project is the FY 2001 ITS Integration Program earmark for the City of Fort Collins, CO. The project will deploy an Advanced Traffic Management System (ATMS) to replace the legacy traffic signal system. The primary features supporting the ATMS will be an underground fiber optics communications network and a Traffic Operations Center. The project's ultimate objective is to deploy an expandable and integratable ATMS. The earmarked funds will be committed to the fiber optics communications network which will support planned integration with multiple city agencies and Colorado DOT. Transit and traffic agencies will develop a transit priority strategy within the ATMS. Pedestrian and cycling technologies will also be reviewed so as to provide early opportunities for integration in the system.

Project Location: Fort Collins, Colorado

Partner(s): FHWA, FTA, City of Fort Collins Traffic Operations Department

Start Date: September 2001

***End Date*:** June 2003

Estimated Total ITS Funds: $992,018

Estimated Total Project Cost: $1,988,410

***Contacts*:**

Scott Sands	FHWA Colorado Division, HFO-CO	(303) 969-6730
Ward Stanford	City of Fort Collins, Traffic Operations	(970) 221-6820

HUNTINGTON BEACH, CA I-405 MULTI-JURISDICTIONAL SMART CORRIDOR AND CALTRANS DISTRICT 12 INTERTIE PROJECT

Description: This project is comprised of the design and deployment of several ITS elements in the cities of Huntington Beach, Fountain Valley and Westminster, California along the I-405 corridor. Key technology components include fibre optic communication to support traffic signals and closed circuit TV, vehicle detection stations and video image processing systems. The fibre optic backbone will support a high speed communications link between Caltrans District 12 and Huntington Beach along I-405. These features will be complemented by design and implementation of integrated workstations and graphical user interfaces to support improved operation of the three cities' traffic signal systems, CCTV cameras and shared information links between Huntington Beach, Westminster and Fountain Valley.

Project Location: I-405 Corridor, California

Partner(s): FHWA; Caltrans; City of Huntington Beach, CA; City of Westminster, CA; City of Fountain Valley, CA

Start Date: November 1999

***End Date*:** December 2003

Estimated Total ITS Funds: $791,530

Estimated Total Project Cost: $1,600,000

***Contacts*:**

Gloria Stoppenhagen	FHWA LA Metro Office	(213) 202-3955
Bob Stachelski	City of Huntington Beach, CA	(714) 536-5523
Venu Sarakki	Sarakki & Associates	(714) 851-3000

ITS IMPROVEMENTS FOR THE CITY OF CLEARWATER

Description:

This project is the FY 2000 ITS Integration Program earmark for Clearwater, Florida. The project calls for integration of the traffic signals along State Route 60, within the City of Clearwater, with upgraded software and hardware to support an adaptive traffic control system. Additionally, Closed Circuit TV (CCTV) and Dynamic Message Sign (DMS) systems are planned to support a more efficient incident response mechanism and real-time dissemination of parking lot/garage occupancy information to the traveling public. Integration is planned between the City of Clearwater Traffic Operations Center (TOC) and Pinellas Suncoast Transit Authority (PSTA). Information from the TOC will be used by PSTA to update bus schedules at major transfer points along S.R. 60.

The City of Clearwater TOC currently operates an Urban Traffic Control System (UTCS) on state and local roadways with approximately 130 out of 145 intersections connected to the system. Some of the arterial signals have an existing capability to provide emergency vehicle preemption; however, this feature is not currently being widely used. The goal of this integration process is to link the upgraded traffic signal system and proposed CCTV and DMS systems with the County 911 center and the parking management system, particularly on Clearwater Beach. In addition, current traffic conditions along S.R. 60 will be available to information service providers. A pedestrian safety component is also planned for integration into the proposed City of Clearwater signal system.

Project Location: City of Clearwater, Florida

Partner(s): FHWA, Florida DOT, City of Clearwater

Start Date: September 2000

***End Date*:** March 2005

Estimated Total ITS Funds: $2,752,000

Estimated Total Project Cost: $5,504,000

***Contacts*:**

Chung Tran	FHWA Florida Division, HDA-FL	(850) 942-9650	Ext. 3041
Bijan Behzadi	Florida DOT	(813) 975-6733	

JACKSON, MISSISSIPPI INTELLIGENT TRANSPORTATION SYSTEM IMPLEMENTATION

Description:

This project is the result of long range planning and inter-agency cooperation. The first elements of the Jackson Metropolitan ITS were deployed in 1994. City bond money and State planning funds have been used to expand the system over the past six years. The City has a Traffic Management Center (TMC) that controls 156 signalized intersections with video surveillance at ten intersections. The Mississippi Department of Transportation (MDOT) also has a TMC that will be integrated with the Jackson TMC. This integration with the MDOT TMC will add coverage to seven additional City-maintained traffic signals. The City will gain access to a video surveillance camera on the main approach to the Jackson Municipal Airport located outside of the city limits. MDOT will be able to monitor all of the traffic signals on the City system. All ten video cameras will be shared with MDOT giving them the ability to monitor a good portion of I-55 on the north side of Jackson. Additionally, the integration of the State and City centers will also allow the implementation of the early stages of incident management.

This project has been expanded in scope and funding by the allocation of funding appropriated by the FY 2001 ITS Integration Program earmark for Jackson, MS. FY 2001 funding builds on FY 99 integration activities. The project focus is the integration of a Traveler Information System with the City's Transit Management System. A fiber optic backbone is the principal vehicle for integrating the City's ITS infrastructure. An additional dimension of integration is a link to the County Emergency Operations Center. FY 2001 funding will contribute to implementation of and integrating:

- Traffic Management
- Emergency Services Management
- Transit Management; and
- Regional Multimodal Traveler Information Services.

Planning calls for integrating Amtrak rail information with Greyhound, and the regional transit provider with Jackson International Airport and the taxi system.

Funding amounts depicted below under "Current Project Cost Estimate" include FY 2001 funding.

Project Location: Jackson, Mississippi

Partner(s): Mississippi DOT; City of Jackson, MS; Jackson Municipal Airport Authority

Start Date: January 2000

***End Date*:** September 2003

Estimated Total ITS Funds: $1,585,085

Estimated Total Project Cost: $3,173,667

Contacts:

Mike Cribb	FHWA Mississippi Division, HDA-MS	(601) 965-4228
Scott Carson	FHWA Mississippi Division, HDA-MS	(601) 965-4232
Daniel Gaillet	Manager, City of Jackson	(601) 960-1651

LAKE COUNTY TRAFFIC MANAGEMENT CENTER FEASIBILITY STUDY AND IMPLEMENTATION PLAN

Description:

This is a discretionary project of the FY2001 ITS Deployment Program for Lake County, Illinois.

GOALS AND OBJECTIVES

The primary goal of this project is to improve mobility. This is to be accomplished with the completion of a systems engineering analysis and implementation plan for the development of a countywide Traffic Management Center (TMC) for Lake County. The systems engineering analysis will identify the major items necessary to determine the most appropriate alternative(s) in selecting a traffic management system/subsystems that address both short and long term transportation needs in Lake County. This systems engineering process should enable the design of the entire Lake County traffic management system, individual components of the system, and/or individual elements within each of the components.

SCOPE OF WORK

This project would include a feasibility study that contains several stages:

(1) A traffic signal inventory of all signals in Lake County, both existing and proposed for all jurisdictions.

(2) Examining the various ways to integrate the traffic signal operations, expanding the existing closed loop signal systems located in Lake County, identifying possible smart corridors within the county, integrating the various systems located within the county together, transit priority, emergency services preemption, and rail grade crossing improvements. Priority will be given to traffic signals under Lake County jurisdiction.

(3) Evaluating Market Packages and technologies to determine the best alternatives to provide traffic signal control and to determine the most suitable alternatives for Lake County Division of Transportation.

(4) Integrating various Lake County Division of Transportation databases.

(5) Identifying for future integration, the capabilities of the Division of Transportation, Lake County Sheriff's Police and the Lake County Emergency Management Agency to implement a countywide incident management detection and response center.

(6) Examining the integration capabilities into the proposed Gateway Traveler Information System, which is being implemented by the Illinois Department of Transportation.

The second part of the project is an implementation plan of the Lake County Division of Transportation Traffic Management Center. This would include the timetable for implementation, site design and equipment purchases.

Project Location:

Lake County, Illinois

Partner(s):

FHWA, Illinois DOT, Lake County Division of Transportation

Start Date: August 2001

***End Date*:** May 2004

Estimated Total ITS Funds: $357,127

Estimated Total Project Cost: $714,254

Contacts:

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
David Zavattero	Illinois DOT	(847) 705-4800
Anthony Khawaja	Lake County Division of Transportation	(847) 362-3950

METRO ARTERIAL MANAGEMENT SYSTEM SOFTWARE UPGRADE AND MTOC/RTMC SYSTEM INTEGRATION

Description: This project is the FY 2001 ITS Integration Program earmark for Nashville, TN. The principal project objectives are to acquire the software/hardware components to support integration of Metropolitan Nashville's ITS-related projects into one comprehensive Arterial Management System. Once deployed, the second objective is to integrate the Arterial Management System with Tennessee DOT's Freeway Management System. The deployment of the Arterial Management System will result in achieving real-time traffic control capabilities through a centralized signal system, arterial surveillance, incident detection and management, and inter-agency communication.

Project Location: Nashville, Tennessee

Partner(s): FHWA, FTA, Tennessee DOT, Metropolitan Government of Nashville and Davidson County

Start Date: September 2001

***End Date*:** June 2003

Estimated Total ITS Funds: $396,807

Estimated Total Project Cost: $793,614

***Contacts*:**

Michael Smart	FHWA Tennessee Division, HPR-TN	(615) 781-5775
Mark Macy	Dept. of Public Works	(615) 862-8764

MUSCLE SHOALS, ALABAMA

Description: This project is the FY 2001 ITS Integration Program earmark for Muscle Shoals, AL. The principal ITS integration activity to be conducted is the integration of 28 signalized intersections. These signalized intersections include state-of-the art traffic control cabinet assemblies, which will be modified to interface with an area-wide signal management system enabling AL DOT secure maintenance and operational access. The project will also deploy two dynamic message signs that will be integrated into the Shoals Metropolitan Area Incident Management System and Advanced Traffic Management System. In addition to extensive ATMS features, the proposed system will deliver Advanced Traveler Information Systems capabilities. These capabilities may include roadway information, traveling conditions, construction activities, and detours.

Project Location: Muscle Shoals, Alabama

Partner(s): FHWA, Alabama DOT, Shoals MPO, Cities of Muscle Shoals, Florence, Sheffield, Tuscumbia

Start Date: September 2001

***End Date*:** June 2004

Estimated Total ITS Funds: $793,615

Estimated Total Project Cost: $1,716,933

***Contacts*:**

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377
Mark Dale	Alabama DOT	(256) 389-1413

PALATKA COMPUTERIZED SIGNAL SYSTEM

Description: This project is the FY 2000 ITS Integration Program earmark for the City of Palatka and Putnam County, Florida. Funding for the project was approved in September 2002. The project will provide a traffic signal closed loop system for twenty-eight existing traffic signals in the City of Palatka and surrounding areas of Putnam County. The focal point of the system will be a Traffic Control Center (TCC) to be connected to the signals by a fiber optic communication plant. When implemented this project will provide real-time information and control capabilities to improve traffic management in the Palatka area.

Project Location: City of Palatka and Putnam County, Florida

Partner(s): FHWA, Florida DOT, Putnam County, City of Palatka

Start Date: September 2002

***End Date*:** February 2004

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $1,305,719

***Contacts*:**

Chung Tran	FHWA Florida Division, HDA-FL	(850) 942-9650	Ext. 3041
Peter Vega	Florida DOT	(904) 360-5463	

PHASE II: ARTERIAL COMMUNICATIONS AND SURVEILLANCE DEPLOYMENT PROJECT

Description:

This project constitutes the FY 2000 ITS Integration Program earmark for Nashville, Tennessee. The objectives of this project support several long term ITS goals including enhanced arterial management, improved incident detection and management, real-time traffic control, and better inter-agency communication. The project focus is on design and installation of multiple fiber optic communications backbones along a number of congested arterial corridors within the Nashville metropolitan area.

These communication backbones will be designed with enough capacity to accommodate ITS needs required by currently funded and future ITS projects developed by Metro. The initial design will also include an evaluation of TDOT's current communications plan. This evaluation will identify opportunities to coordinate the efforts and strategies of both agencies. In addition to the communications element, this project will include the installation of CCTV video surveillance. This will provide the initial installation of the Metro surface street monitoring system. The video surveillance will be used in the verification of incidents and the implementation of improved signal control along these corridors.

The installation of a communications backbone will provide the necessary infrastructure required to integrate Metro's proposed incident detection system, arterial surveillance system, and traffic control system. It will also provide the initial stages for the required infrastructure to link each of the proposed traffic management centers in the region. In the future, it may be used for the installation of VMS devices or other ITS components located along the selected corridors.

Project Location: Nashville, Tennessee

Partner(s): FHWA, Tennessee DOT, Metropolitan Government of Nashville and Davidson County

Start Date: January 2001

***End Date*:** January 2003

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $1,572,842

***Contacts*:**

Michael Smart	FHWA Tennessee Division, HPR-TN	(615) 781-5775
Devin Doyle	Nashville and Davidson Co. Dept. of Public Works	(615) 862-8764

SR-836 EXPRESSWAY INTEGRATED ADVANCED TRAFFIC MANAGEMENT SYSTEM

Description:

This project constitutes the FY 2000 ITS Integration Program earmark for Miami, Florida. The State Road 836 (SR 836) in Miami-Dade County is one of the most heavily traveled and congested corridors in Southeast Florida. The SunGuide system, previously referred to as the Intelligent Corridor System (ICS), incorporates all Intelligent Transportation System (ITS) projects in Southeast Florida. The goal of the SunGuide system is to improve traveler safety and mobility for residents and visitors by applying advanced traffic management and traveler information strategies. The SunGuide Design Report identified the SR 836 corridor for ITS Deployment.

The SR 836 Expressway ITS Improvement Project proposes to implement an Advanced Traffic Management System (ATMS) along the SR 836 corridor in Miami-Dade County, Florida. The proposed Miami-Dade Expressway (MDX) ATMS components will be integrated with the existing SunGuide program, such that their operations will become seamless. The MDX ATMS components that are proposed for the project include non-intrusive system detectors, full coverage video surveillance, Highway Advisory Radio (HAR), and a communication system for integrating the MDX Field Components with the SunGuide Control Center.

The MDX ATMS components will be integrated with other regional ITS and incident management systems and initiatives including the SunGuide Control Center, SunGuide Service Patrols, Florida Highway Patrol, MDX SunPass Electronic Toll Collection System, and SunGuide Advanced Traveler Information System.

The FY 2002 ITS Integration Program earmark for Miami-Dade County, FL builds on and modifies the FY 2000 earmarked project by constructing the fiber optic communications backbone throughout the entire length of SR 836 from the Florida Turnpike to I-95. This modification includes the electronics required to integrate the FL Turnpike ITS, the FL DOT District 6 I-95 system, and the MDX SR 836 system. Estimated cost figures depicted below include FY 2002 earmarked funding of $827,318. The end date reflects schedule adjustments required to accommodate the expanded project scope.

Project Location: Miami-Dade County, Florida

Partner(s): FHWA, Florida DOT, Miami-Dade Expressway Authority

Start Date: March 2000

End Date: July 2004

Estimated Total ITS Funds: $1,613,739

Estimated Total Project Cost: $5,932,000

Contacts:

Chung Tran	FHWA Florida Division - HDA-FL	(850) 942-9650	Ext. 3041
Arnie Fernandez, Jr.	Florida DOT	(305) 470-5238	
Sam Gonzales	Miami-Dade Expressway Authority	(305) 375-3232	

TEMECULA, CALIFORNIA I-15 TRAFFIC SURVEILLANCE AND SIGNAL SYSTEM INTEGRATION PROJECT

Description: The primary goals of this FY 1999 Integration Program project are to support existing and future economic and community development without a major increase in traffic congestion and delay along the I-15 corridor and on the city's major arterials. The project will design and install four closed circuit TV cameras (CCTV); design and install a communications system between the CCTV and the city's Traffic Operations Center (TOC), and install the necessary integrated workstation/graphical user interface to integrate, control and monitor the traffic signal system, the surveillance system and freeway variable message signs. Also included is a communication intertie between the city's TOC and Caltrans District 8.

Project Location: Temucula, California

Partner(s): FHWA, Caltrans, City of Temecula, California

Start Date: September 1999

***End Date*:** June 2003

Estimated Total ITS Funds: $197,867

Estimated Total Project Cost: $437,867

***Contacts*:**

Gloria Stoppenhagen	FHWA LA Metro Office	(213) 202-3955
Jerry Gonzalez	City of Temecula, CA	(909) 694-6411

TRAFFIC SIGNAL SYSTEMS INTEGRATION AND DEPLOYMENT

Description:

This project was initiated as the FY 2001 ITS Integration Program earmark for Moscow, Idaho. FY 2001 project objectives included:

- Developing and implementing a plan to improve traffic flow and safety in the City of Moscow by upgrading and integrating the city's traffic signal control system.

- Developing and applying a protocol for the design, implementation, and testing of traffic signal timing plans using real-time hardware-in-the-loop simulation.

- Providing a list for the implementation of NTCIP Standards in a small town traffic control system.

FY 2001 funding will also deploy new traffic controller cabinets at ten intersections currently using outdated cabinets. Concurrently, controllers and conflict monitors in other cabinets will be upgraded. Coordination will be provided by a master controller system using emerging ITS standards for on-street masters.

This project has been expanded as a result of being earmarked in the FY 2002 ITS Integration Program. FY 2002 Congressionally designated funding is $827,318. Matching funds, federal and non-federal, increased the total funding to $1,654,636.

The additional tasks to be accomplished with FY 2002 funding include upgrading the University of Idaho's Traffic Controller Laboratory and the development of guidelines to be used by Idaho Transportation Department to implement closed loop and centralized traffic control systems in small towns. The major component of the upgrade will be development of a remote access capability for the laboratory. This remote access will enable distant users to develop and test traffic signal timing plans using real-time hardware in the loop simulation in conjunction with the University's controller interface device.

FY 2002 funding will also be used to deploy the supporting communications system required to connect the city's traffic controllers.

Project Location: Moscow, Idaho

Partner(s): FHWA, Idaho DOT, City of Moscow, University of Idaho-National Institute for Advanced Transportation Technology

Start Date: September 2001

End Date: June 2005

Estimated Total ITS Funds: $1,521,731

Estimated Total Project Cost: $3,139,095

Contacts:

Ross Blanchard	FHWA Idaho Division, HDA-ID	(203) 334-9180	Ext. 112
Michael Kyte	University of Idaho	(208) 885-6002	

TUCSON, ARIZONA INTEGRATION OF REAL-TIME TRAFFIC INFORMATION FOR ADAPTIVE SIGNAL CONTROL, TRAVELER INFORMATION AND MANAGEMENT OF TRANSIT AND EMERGENCY SERVICES

Description:

In the last few years the Systems and Industrial Engineering Department at the University of Arizona (UofA) has been involved with several ITS projects including operational testing of traffic adaptive signal control and research/development of innovative approaches to real-time prediction of traffic conditions and transit priority. This FY 1999 ITS Integration Program project will integrate many of the results and findings from these projects. In particular, the UofA and its partners/collaborators will integrate available real-time traffic information from loop detectors and other sources for real-time traffic-adaptive signal control, for real-time traffic prediction for traveler information, for adaptive signal priority for transit vehicles, and for pro-active coordination of signal phasing to provide preemptive pathways for emergency vehicles.

This project consists of five sub-projects: Development of an ITS strategic deployment plan and an architecture that allows for the integration of the required real-time information; Deployment and integration of a real-time traffic prediction method for traveler information systems; Deployment and integration of a real-time traffic adaptive signal system for a grid of intersections; Deployment and integration of transit signal priority for an arterial; and Deployment and integration of route advisory and limited traffic signal coordination/preemption for emergency vehicles.

Project Location: Tucson, Arizona

Partner(s): FHWA, Arizona DOT, City of Tucson, Pima Association of Governments, Gardner Systems, Catalina Engineering, Inc.

Start Date: September 1999

***End Date*:** June 2004

Estimated Total ITS Funds: $791,469

Estimated Total Project Cost: $2,270,000

***Contacts*:**

Alan Hansen	FHWA Arizona Division, HPR1-AZ	(602) 379-3645	Ext. 108
Pitu Mirchandani	University of Arizona	(520) 621-2990	

WHITE PLAINS-WESTCHESTER COUNTY, NEW YORK INTEROPERABLE COORDINATED SIGNAL SYSTEM

Description: This project will establish an interoperable coordinated signal system (ICSS) on adjoining New York State arterials and existing coordinated signal systems owned and operated by the City of White Plains and the County of Westchester in the White Plains urban area. This project aims to create a unified, interoperable coordinated signal system that integrates city, county, and state signal subsystems. Each subsystem will be autonomous, but will be interconnected for operations as a single system when required.

Project Location: White Plains, New York

Partner(s): New York State DOT; City of White Plains, New York; Westchester County, New York

Start Date: September 1999

***End Date*:** November 2003

Estimated Total ITS Funds: $791,470

Estimated Total Project Cost: $1,580,000

***Contacts*:**

Mike Schauer	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 236
John Marzi	NYSDOT	(914) 949-2103	

Freeway Management Systems

BETA TESTING OF SOFTWARE - PH. II

Description: This activity allows practitioners to assess the integrity and applicability of newly modified or developed FHWA software. This allows FHWA to better match user needs, thereby reducing the time needed to bring traffic engineering software to the market-ready stage.

Project Location: Gainsville, Florida

Contractor(s): University of Florida

Start Date: June 2000

***End Date*:** June 2004

Estimated Total ITS Funds: $426,192

Estimated Total Project Cost: $426,192

***Contacts*:**

Henry Lieu	FHWA - TFHRC, HRDO-03	(202) 493-3273

BRONX/NORTHERN MANHATTAN ATMS

Description: This project has two parts:

Part 1: Transmit Expansion - This project will expand TRANSCOM's Transmit Program into Bronx County. Approximately 18 reader locations that will be capable of communicating with the E-Z Pass tags will be installed on various highways in the Bronx for traffic data collection purposes.

Part 2: Systems in the State/City Traffic Management Center (TMC) (2 projects) - This program will construct an interim and permanent traffic control center for New York State DOT in the Long Island Corridor. This first project will cost $0.5M and was completed in early 1999. The second project (for the permanent center) will cost $1.7M and is scheduled for construction in early 2000 with completion of construction in June 2003.

Project Location: New York, New York

Partner(s): New York State DOT

Start Date: July 1995

***End Date*:** June 2003

Estimated Total ITS Funds: $4,650,000

Estimated Total Project Cost: $5,812,500

***Contacts*:**

Arthur O'Connor	FHWA New York Division NYC Metro Office	(212) 668-2206
Fred Lai	New York State DOT	(718) 482-4733

CDOT I-70 WEST INTEGRATION PROJECT

Description:

This project is the FY 2001 ITS Integration Program earmark for I-70 West of Denver, Colorado. The project is part of an ongoing deployment and integration program for ITS in Colorado. It builds on previous efforts and concurrent initiatives. The primary focus is the integration of various data collection, communications, information dissemination and traffic control systems along the I-70 mountain highway corridor West of Denver.

Three Colorado DOT (CODOT) control centers in the I-70 corridor currently manage traffic and disseminate traveler information along localized segments of the corridor, but lack communications capabilities among each other which detracts significantly from an integrated approach along the entire corridor. This project will partially enhance communications and data sharing between:

- The Colorado Transportation Management Center (CTMC) in Lakewood;
- The Eisenhower Tunnel Control facility near Dillon; and
- The Hanging Lake Tunnel (HLT) control facility in Glenwood Canyon.

The partial integration carried out by this project leverages separately-funded installation of the Shared Resources high-speed fiber optic line along the corridor in 2001. Other components of this project include implementation of the I-70 probe network, and a study to plan future interfaces with Denver International Airport.

Project Location: I-70 West of Denver, CO

Partner(s): FHWA, Colorado DOT, Denver International Airport, University of Colorado at Denver

Start Date: September 2001

***End Date*:** September 2003

Estimated Total ITS Funds: $595,523

Estimated Total Project Cost: $1,193,046

***Contacts*:**

Scott Sands	FHWA Colorado Division, HFO-CO	(303) 969-6730	Ext. 362
John Nelson	Colorado DOT	(303) 512-5838	

CHARLOTTE, NORTH CAROLINA INTEGRATION PROJECT

Description: This project comprises the FY 2001 ITS Integration Program earmark for Charlotte, North Carolina. The project, while retaining its unique identity, builds on the FY 2000 earmark for the Charlotte, Mecklenburg County, North Carolina area. The principal project objective is to integrate the Charlotte DOT Traffic Operations Center (TOC) and the North Carolina DOT (NCDOT) Transportation Management Center (TMC). This project activity enables the NCDOT to operate the US 74 High Occupancy Vehicle system and CDOT to implement remote operation capability of the Freeway Management System on I-77. An added feature of this project is the further interconnection of, and associated information sharing between the NCDOT Metrolina TMC and the CDOT TOC. Additionally, connectivity with Public Safety agencies will enable improved incident response.

Project Location: Charlotte, North Carolina

Partner(s): FHWA, FTA, North Carolina DOT, Charlotte DOT, Charlotte Area Transit System

Start Date: September 2001

***End Date*:** April 2003

Estimated Total ITS Funds: $496,009

Estimated Total Project Cost: $992,018

***Contacts*:**

Max Tate	FHWA North Carolina Division, HDA-NC	(919) 856-4354	Ext. 125
Ann Lorscheider	North Carolina DOT	(919) 250-4151	

COLORADO TRANSPORTATION MANAGEMENT CENTER (CTMC) INTEGRATION PROJECT

Description: This project is the FY 2001 ITS Integration Program earmark for Jefferson County, Colorado. The project will accelerate integration activities along the I-70 corridor west of Denver at the Colorado Transportation Management Center (CTMC). The focus of Federally-funded integration will be on software controlling both internal devices and providing a platform for linking to other control centers. A follow-on component of this project will identify, procure and implement statewide advanced traffic management and advanced traveler information software systems at the CTMC. These software applications will link disparate ITS subsystems through a common set of command, control and operating systems and user interfaces.

Project Location: Jefferson County, Colorado

Partner(s): FHWA, FTA, Colorado DOT, Cities of Colorado Springs and Lakewood

Start Date: September 2001

***End Date*:** June 2004

Estimated Total ITS Funds: $3,372,862

Estimated Total Project Cost: $6,760,596

***Contacts*:**

Scott Sands	FHWA Colorado Division, HFO-CO	(303) 969-6730	Ext. 362
John Nelson	Colorado DOT	(303) 512-5838	

ELECTRONIC PERMITTING FOR OVERSIZE AND OVERWEIGHT VEHICLES

Description:

This project is a component of the FY 2000 State of Alabama Earmark. The project is an integral part of a major ITS initiative in the Birmingham, AL metropolitan area which seeks to reduce congestion and air pollution. Electronic Permitting for Oversize and Overweight Vehicles is a FY 2000 project that will provide fast and accurate route and clearance checking and bridge analysis approval. The ALDOT proposes to integrate an automated permitting function for commercial vehicles. This will enable commercial vehicle operators to obtain automated route information and permits for oversize and overweight loads throughout the highway system. The Birmingham area will be specifically targeted. Construction zone work information will be provided from the ALDOT Third Division Office to the permitting section in the ALDOT Maintenance Bureau. The Birmingham TCC can provide real-time congestion information to allow the permitting process to ensure these problem loads avoid congested routes. When overweight or oversize loads are scheduled, timing of routes through Birmingham will be a factor in issuing permits. The Department of Public Safety (State Troopers) will be notified of any special loads requiring escort vehicles, special enforcement measures, or special coordination with ASAP service patrol units. The Birmingham TCC will, similarly, be notified of special loads as needed to manage the freeway system. The system will allow improved coordination of agencies involved in managing congestion and the routing of oversize and overweight vehicles. The digital roadway network model will provide a fast, reliable determination of all conditions and events along the vehicle trip path. These can be key in avoiding congested sites in Birmingham. The project will also improve the efficiency of the process by automating the bridge rating process and clearance restrictions for overweight and oversize vehicles. It will provide better customer service to motor carriers by streamlining credential application, taxation, and payment procedures, and weight and safety enforcement to permit compliant operators to avoid costly delays.

Project Location: Birmingham, Alabama

Partner(s): FHWA, Alabama DOT, Birmingham-Jefferson County Transit Authority, Birmingham Regional Planning Commission, Jefferson County, Shelby County, City of Hoover

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $800,000

Estimated Total Project Cost: $1,000,000

***Contacts*:**

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377	
Lewis Harden	FHWA Alabama Division, HDA-AL	(334) 223-7390	Ext. 230
Bob Kratzer	Alabama DOT	(334) 242-6253	

FAIRBORN, OHIO ADVANCED TRAFFIC MANAGEMENT SYSTEM

Description: The purpose of this project is to improve mobility on public roadways in the vicinity of a university multipurpose arena during special events. The consultant is also evaluating the effectiveness of Advanced Traveler Information System technologies when integrated with traditional traffic engineering improvements.

Project Location: Fairborn, Ohio

Partner(s): Ohio DOT, Miami Valley Regional Planning Commission (MVRPC), City of Fairborn, City of Beavercreek, and Wright State University.

Start Date: May 1998

***End Date*:** March 2003

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,000,000

***Contacts*:**

James Buckson	FHWA Ohio Division, HDA-OH	(614) 280-6846
George Saylor	Ohio DOT	(614) 752-8099
Anne Hassoun	MVRPC	(937) 233-6323

GATEWAY GUIDE ENHANCEMENT

Description: This FY 2000 earmarked project will install additional field devices to the freeway management and incident management infrastructure covering interchanges and major river crossings in the St. Louis area. Included among field components are detector stations, cameras, and ramp metering devices that would connect to an existing communications network. This added surveillance and information dissemination capability, supplemented by Automatic Vehicle Location system expansion on roadside assistance vehicles, will expand existing incident response capability. The project will develop and deploy software and roadside device components for automatic lane control signals along I-64/US Route 40 corridor at the Missouri River Bridge.

Project Location: St. Louis, Missouri Regional Area

Partner(s): FHWA, Missouri DOT, East-West Gateway Coordinating Council, Bi-State Development Agency, City of Chesterfield Police Dept., City of Town and Country Police Dept.

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $1,608,421

***Contacts*:**

Bob Thomas	FHWA Missouri Division, HDA-MO	(573) 636-7104
Thomas Ryan	Missouri DOT	(314) 340-4501

I-40/I-25 SYSTEM INTERCHANGE CONSTRUCTION

Description:

This project comprises the FY 2000 ITS Integration Program earmark for Albuquerque, New Mexico. The I-25/I-40 System Interchange reconstruction project will include installation of two, four inch, multi-duct backbone conduits and appurtenant roadside device conduit throughout the limits of construction. The conduit will be configured and installed to allow future installation of an ITS fiber optic communication backbone and connection of planned ITS roadside devices including Variable Message Signs, CCTV Cameras, speed/occupancy detection devices, etc.

The System Interchange reconstruction will also implement a construction ITS component as part of the project. This system will consist of 10 to 12 CCTV cameras, 4 speed/occupancy detection cameras, eight 3ft by 9ft permanent variable message signs, eight portable variable message signs, two smart work zone trailers (camera, detection, sign, trailer mounted), and a spread spectrum radio/cellular distributed packet data wireless communication infrastructure to operate the equipment from a central location. The system will also include 2 Traffic Management Center Operator Stations, a video wall, and will update the Highway Advisory Radio System to allow immediate updates and live broadcasts. The project provides two New Mexico State Highway and Transportation Department (NMSHTD) HELP Courtesy Vehicles to patrol the construction zone and assist in incident response. Further, the system will provide real time video images and traffic information on an Internet website, www.thebigi.com.

The conduit will facilitate integration of the proposed Albuquerque Advanced Metropolitan Travel Management System / Freeway Management System / Incident Management System (AMTMS), currently being designed by the NMSHTD. The conduit will ensure a metropolitan area communication backbone capable of supplying adequate communication bandwidth for the metropolitan area throughout the limits of the proposed construction. Installation of the conduit at this time will eliminate the need to disturb / reconstruct the new Interstate pavement following construction to install the fiber optic backbone being designed as part of the AMTMS project.

The AMTMS project intends to provide fiber optic backbone along significant portions of I-40 and I-25 in the Metropolitan Planning Area. The intent is to provide backbone communication bandwidth capable of sustaining future City, County and State ITS deployment projects as outlined in the Regional ITS Architecture. The I-25/I-40 Interchange Reconstruction is located in the core of the Metropolitan Planning Area (MPA) and at the center of the AMTMS project. The installation of conduit is a necessity to ensure future ITS integration capabilities throughout the MPA.

Project Location: Albuquerque, New Mexico

Partner(s): FHWA, New Mexico State Highway and Transportation Department, City of Albuquerque

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $1,572,842

Estimated Total Project Cost: $3,145,684

Contacts:

Joe Maestas	FHWA New Mexico Division, HDA-NM	(505) 820-2026
Alan Whitesel	New Mexico State Highway and Transportation Department	(505) 222-4400

I-80 REAL-TIME TRAFFIC MANAGEMENT PLAN

Description: This project will develop a traffic management plan (TMP) to facilitate management of traffic during a major rehabilitation of a section of I-80 in California. The TMP will develop a comprehensive approach to coordinating individual TMPs for each individual project site. The project will provide real-time traffic volumes, speeds and occupancies during construction. Principal technology deployments to achieve project goals include microwave-based sensors, traditional inductive loop detectors and communications infrastructure supporting Cellular Distributed Packet Data and Leased Analog phone line service.

Project Location: Interstate 80 in California and Nevada

Partner(s): FHWA, CalTrans, Sacramento Area Council of Governments, Sacramento, Placer Counties, CA, Nevada, Sierra Counties, NV

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $79,361

Estimated Total Project Cost: $158,722

***Contacts*:**

Frank Cechini	FHWA California Division, HDA-CA	(916) 498-5005
Karl Dreher	California DOT	(916) 274-5973

I-81 CORRIDOR ITS PROGRAM

Description:

Interstate Highway 81 is the longest section of Interstate in the Commonwealth of Virginia. I-81 in Virginia is scheduled for major reconfiguration and extensive re-construction over the next 20 years creating a unique opportunity to deploy Intelligent Transportation Systems (ITS) along the length of a crucial Interstate. To address ITS in the I-81 corridor, VDOT has created a formal organizational framework capable of achieving successful ITS integration in the short term, during the multiyear reconstruction of I-81 and in the post construction period. The I-81 ITS Program is designed to improve the planning and implementation of ITS in the I-81 Corridor through the integration of ITS applications in the short term and during the planned re-construction and post-construction Corridor operations. The Program framework consists of two levels. At the project/technical level there is a Technical Committee and ten Technical Working Groups, each covering a specific emphasis area. These Working Groups assess the needs in their particular emphasis area, and develop proposals to address the identified needs. This project is designed to support the first year of the I-81 ITS integration program.

This project constitutes the FY 2001 ITS Integration Program earmark for the Commonwealth of Virginia. The initial program of projects consists of twenty project initiatives summarized as follows:

- Continuation of program management.
- Develop/refine a draft concept of operations for the corridor.
- Retain the services of a system integrator.
- Establish a set of decision criteria applicable to the use of dynamic message signs and a set of approved alerts.
- Develop a training program for incident response and clearance.
- Development of ITS Design Guidelines.
- Design and implementation of a Database Management System.
- Development of a I-81 ITS Communications Program.
- Four subprojects designed to expand "Travel Shenandoah," a Shenandoah Valley Traveler Information program.
- Implementation, testing and evaluation of a pilot "Truck Fleet Alert & CVO Travel Service" for the I-81 corridor.
- Two public safety initiatives: a public safety strategic plan, and deployment of remote real-time audio and video connections enabling communications between medical helicopters and on-scene EMS providers.

Project Location: Commonwealth of Virginia

Partner(s): FHWA, Virginia DOT, Virginia Tech Transportation Institute, SHENTEL, Lord Fairfax Planning District Commission, Valley Health Systems, ComCARE Alliance, University of Virginia, James Madison, George Mason Universities

Start Date: September 2001

***End Date*:** December 2004

Estimated Total ITS Funds: $3,164,880

Estimated Total Project Cost: $14,382,500

Contacts:

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
James Robinson	Virginia DOT	(804) 786-6677

I-90 CONNECTOR, RENSSELAER COUNTY, NEW YORK

Description:

The FY 1998 Rensselaer County earmark of $1.25M has been divided into two projects. The Rensselaer Polytechnic Institute (RPI) will receive $500K to develop ITS training and the remaining funds ($750K) will be used for ITS research to support the I-90 Connector/Test Bed. ITS Test Bed Research--This project will fund ITS research on a 3-mile, test bed facility on the Rensselaer County, I-90 Connector. The ITS research will include: investigation of communications technologies to link the test bed with the soon-to-be opened Northway Incident Management/Traffic Operations Center, traffic operations data collection, deployment of temporary ITS equipment in the study area, and the establishment of partnerships with educational institutions and/or private sector ITS firms. RPI, in coordination with the FHWA Professional Capacity Building Program, will use advanced education technologies to design, develop and deploy educational modules on ITS topics in a variety of settings. The target audience for this new training is ITS professionals. Course topics to be addressed are wireless communications, the operations of a traffic management center, and video detection and surveillance technologies. All of the education modules will be designed to be delivered (1) in face-to-face classroom settings, (2) individual learning via either the Web or CD ROM and (3) using distance learning technologies such as video conferencing and interactive web work.

Project Location: Rensselaer County, New York

Partner(s): New York State DOT

Start Date: October 1998

***End Date*:** December 2003

Estimated Total ITS Funds: $1,250,000

Estimated Total Project Cost: $1,562,500

***Contacts*:**

Mike Schauer	FHWA New York Division, HDT-NY	(518) 431-4125	Ext. 236
Paul Cuerdon	New York State DOT	(518) 474-6377	

KANSAS CITY REGION INTEGRATED AUTOMATION SYSTEM DEVICES

Description: The objective of this FY 1999 ITS Integration Program project is the deployment of Integrated Automation Management System Devices (computer hardware) for the new Traffic Operation Centers (TOC) in the Kansas City Region. These devices will serve as the central processing units for the Kansas City Region. The operations of Freeway, Incident and Corridor Management Subsystems will be controlled through these devices. Center-to-center communications between other region partners (emergency services, transit, information service providers, etc.) and other Midwest cities in Illinois, Kansas, Iowa, Nebraska, etc., will result as part of sharing regional transportation information. Completion of this project has been delayed by a requirement to integrate systems with a related project, the Kansas City Scout Freeway Management System, whose software has been delayed.

Project Location: Kansas City Region

Partner(s): Missouri DOT, Kansas DOT, Mid-America Regional Council, Digital Teleport Inc.

Start Date: September 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $395,735

Estimated Total Project Cost: $795,735

***Contacts*:**

Bob Thomas	FHWA Missouri Division, HDA-MO	(573) 636-7104
Bruce Baldwin	FHWA Kansas Division, HDA-KS	(785) 267-7281

LOUISIANA INTERSTATE 55, 10 AND 610, INTELLIGENT TRANSPORTATION SYSTEMS

Description: The focus of this project will be the deployment of ITS elements in the New Orleans Metropolitan area. Emphasis will be placed on traveler information systems, video surveillance and interagency communication subsystems. This project will also include the design and construction of a Traffic Management Center.

Project Location: New Orleans, Louisiana

Partner(s): Louisiana State DOT, New Orleans Regional Planning Commission

Start Date: October 1998

***End Date*:** September 2003

Estimated Total ITS Funds: $5,500,000

Estimated Total Project Cost: $6,875,000

***Contacts*:**

John Broemmelsiek	FHWA Louisiana Division, HDA-LA	(225) 757-7614
Steve Strength	Louisiana State DOT	(504) 437-3260
Conrad Rein	New Orleans Regional Planning Commission	(504) 568-6643
Steve Glascock	Louisiana State DOT	(225) 935-0130

LOWER HUDSON VALLEY

Description: This project will provide for the creation of a Transportation Management Center (TMC) which will be jointly staffed by the New York State Department of Transportation, the New York State Thruway Authority, and the County of Westchester. As design progressed, the scope and total cost of the TMC have been significantly increased to enhance interagency operations. This multi-agency facility in the Interstate I-287 corridor, known as the Cross Westchester Expressway, was funded at $21,000,000 as of fall CY 2000.

Project Location: Westchester County, New York

Partner(s): New York State DOT

Start Date: July 1995

***End Date*:** September 2003

Estimated Total ITS Funds: $1,500,000

Estimated Total Project Cost: $21,000,000

***Contacts*:**

Mike Schauer	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 236
Mike Hartman	New York State DOT	(518) 457-1232	

MOBILE, ALABAMA ITS INTEGRATION

Description:

The goals of this FY 1999 ITS Integration Program project are the development of integrated, National ITS Architecture - conforming Freeway Management and Incident Management systems, and the planning for follow-on integration and deployment of Metropolitan ITS infrastructure.

The objectives of a freeway and incident management system which would apply to the Mobile area are to effectively perform such functions as surveillance and incident detection, information dissemination, and coordination with other traffic and freeway management systems and incident detection. Mobile has several building blocks of these components already in place but requires an integration approach in bringing these elements together to work in a unified manner. Two key components need to be implemented in Mobile: additional field and communication equipment. For example, the regional traffic management center in place does not have the necessary equipment for monitoring the appropriate arterials to aid in the dissemination of traveler information and provide surveillance and incident detection. Also, since the Mobile area has had only one ITS-funded project deployed, the Fog Detection Project, the purchase of additional equipment is critical to create a regional ITS architecture to support integrated ITS deployment.

The ITS integration plan will be developed as a long-range plan describing how the existing systems can come together, and by utilizing the National Architecture, to form a regional architecture through the use of market packages. The plan will be able to set both short-term and long-term goals and objectives. Market packages such as Network Surveillance, Incident Management, and Traffic Information Dissemination can provide useful information by linking agencies and informing the public through user services. User services can include identifying scheduled/planned incidents (e.g. construction activity), detect incidents, formulate response actions, support initialization of response actions (Mobile County Emergency Management Center), and predict hazardous conditions.

Project Location: Mobile, Alabama

Partner(s): Alabama DOT, City of Mobile, County of Mobile, Metropolitan Transit Authority, South Alabama Regional Planning Commission

Start Date: September 1999

End Date: December 2003

Estimated Total ITS Funds: $1,979,000

Estimated Total Project Cost: $2,311,000

Contacts:

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377
Bob Kratzer	Alabama DOT	(334) 242-6253

MONITOR

Description:

MONITOR is Milwaukee's Freeway Traffic Management System. The MONITOR build-out is a $40 million investment in the Operations of the Milwaukee Area Freeway and Arterial System. FY 1998 funding contributed to MONITOR Stage VI Construction, MONITOR Software, and the Traffic Incident Management Enhancement Program. MONITOR Stage VI will implement various equipment that was not placed in operation during the five previous stages, including the last 15 of 120 ramp meters. An Independent Software Advisor will assist in the oversight and direction of all TOC software development activities. MONITOR Software was upgraded to make the existing system year 2000 compliant. Stage A of the MONITOR Software Upgrade will be funded, including the software coding for the Regions' Traveler Information HUB. New Enhanced Freeway Patrol Service will begin in Washington, Ozaukee and Waukesha Counties, and existing service patrols will be expanded in Racine and Kenosha Counties.

Project Location: Southeastern Wisconsin

Partner(s): Wisconsin DOT

Start Date: October 1998

***End Date*:** August 2003

Estimated Total ITS Funds: $5,500,000

Estimated Total Project Cost: $6,875,000

***Contacts*:**

John Berg	FHWA Wisconsin Division, HDA-WI	(608) 829-7515
Philip DeCabooter	State of Wisconsin DOT	(608) 267-0452

NASHVILLE, TENNESSEE AREA INTELLIGENT TRANSPORTATION SYSTEM

Description: This FY 1999 ITS Integration Program project is part of the phased implementation of the Nashville Area Intelligent Transportation System Strategic Deployment Plan. The project will develop a Regional Traffic Operations Center and the communications system to integrate it with the cities of Murfreesboro, Franklin, and the backbone Tennessee DOT will install along the interstate highway system. Early capabilities include implementation of real-time accident reporting and a parking and traffic guidance system.

Project Location: Nashville, Tennessee

Partner(s): Tennessee DOT, Metropolitan Government of Nashville, Davidson County Department of Public Works

Start Date: September 1999

***End Date*:** December 2003

Estimated Total ITS Funds: $395,735

Estimated Total Project Cost: $791,470

***Contacts*:**

Michael Smart	FHWA Tennessee Division, HPR-TN	(615) 781-5775
Devin Doyle	Nashville and Davidson Co. Dept. of Public Works	(615) 880-3262

PENNSYLVANIA TURNPIKE COMMISSION ITS PHASE 6

Description:

This project comprises the FY 2001 ITS Integration Program earmark for the Pennsylvania Turnpike Commission. Funding for the project was approved in September 2002. The project will serve to expand upon ITS applications deployed on the Pennsylvania Turnpike System. The Phase 6 project will include expansion of the traffic detection and verification system via the collection of information from electronic toll tag and/or radar detection system. This information can be disseminated through the Interchange Dynamic Messaging System to drivers prior to entry in the Turnpike System through highway advisory radio, dynamic message signs, and the Pennsylvania Turnpike Commission Website and/or e-mail system.

FY 2001-funded efforts will identify and prioritize optimized locations for the traffic flow monitoring system employing toll tag and/or radar. Operational procedures, and system monitoring protocols will be established in conjunction with equipment design and installation.

Project Location: Pennsylvania

Partner(s): FHWA, PennDOT, Pennsylvania Turnpike Commission

Start Date: September 2002

***End Date*:** January 2006

Estimated Total ITS Funds: $1,190,422

Estimated Total Project Cost: $2,400,000

***Contacts*:**

Jessie Yung	FHWA Pennsylvania Division, HIT-PA	(717) 221-4422	
Timothy Scanlon	Pennsylvania Turnpike Commission	(717) 939-9551	Ext. 5590

PORT OF TACOMA TRUCKER CONGESTION

Description:

This project is the FY 2002 ITS Integration Program earmark for Tacoma, Washington. The project will fill a gap in surveillance camera and traffic flow detection coverage along the Interstate 5 Tacoma corridor. This otherwise well-instrumented corridor does not include coverage for Port of Tacoma truck traffic approaching from the north. Existing systems also do not cover any routes into the port other than I-5. Washington State DOT is developing a fiber optic communications cable system to link deployed ITS elements on I-5, and this project will expand the system to distribute traffic information impacting the Port of Tacoma to local agencies, motorists and WSDOT

This project will expand traffic surveillance coverage north of the Port of Tacoma/I-5 interchange by installing two new traffic detection sites at one-mile intervals from the currently deployed sites. This deployment will be augmented by installation of additional Closed Circuit TV sites. This CCTV deployment will provide complete coverage of the Port of Tacoma vicinity. An added feature of this project is an additional Highway Advisory Radio that will be integrated into the existing radio network. The final component of this project, implemented as the last phase, is an expansion of the Tacoma fiber optic cable network. An added link will provide WSDOT, the City of Tacoma Fire Department, and the Washington State Patrol to access new and existing CCTV sites.

Project Location: Tacoma, Washington

Partner(s): FHWA, Washington State DOT, Washington State Patrol, Port of Tacoma, City of Tacoma Fire Department

Start Date: September 2002

***End Date*:** July 2003

Estimated Total ITS Funds: $165,464

Estimated Total Project Cost: $330,928

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
John Nisbet	Washington State DOT	(360) 357-2670

PUEBLO GATEWAY INTERCHANGE FREEWAY MANAGEMENT SYSTEM

Description:

This project constitutes the FY 2000 Earmark for Pueblo, CO. Historically, construction activities, weather conditions, daily commutes, and traffic accidents cause congestion and hinder the movement of traffic at and around the Gateway Interchange. The heavy congestion has also contributed to an accident and injury rate that is double the national average for traffic areas of this type. ITS applications have been shown to be effective in reducing congestion and enhancing safety like those experienced around Pueblo's Gateway Interchange, which is located at the intersections of I-25, US 50, and SH47.

This is a multi-phased project that seeks to implement Freeway and Incident Management enhancements along the I-25 State Highway 47 interchange (Gateway Interchange) in Pueblo. Goals of the Freeway Management System are to:

- Improve traffic safety and operations.
- Facilitate incident management and traveler mobility.
- Enhance economic growth.
- Facilitate future ITS applications.
- Coordinate existing information systems such as RWIS, traffic counting systems, etc.
- Collect and process traffic and system data to support operations and planning.

These goals will be pursued through achievement of objectives enabled by ITS applications. Deployment and/or integration of ITS applications are summarized as:

- Dynamic message signing to improve driver information for both incident management and route guidance to special events.
- Traffic signal coordination to reduce delay times.
- Loop detectors, video image detection and closed circuit television to provide information to assist in incident detection and response.
- Information sharing across regional boundaries and statewide ITS sections to assist in traffic management and planning.
- Information sharing among agencies (police, fire, and ambulance services) to reduce response times.

This project implements phase two, which includes incident detection and closed circuit TV sites along I-25, an additional dynamic message sign for eastbound traffic along highway 50 and a communications and control system to enable full time monitoring, control and surveillance of the corridor.

Project Location:

Pueblo, Colorado

Partner(s):

FHWA; Colorado DOT; Colorado State Patrol; City of Pueblo, CO

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $1,179,631

Contacts:

Scott Sands	FHWA Colorado Division, HFO-CO	(303) 969-6730
Terry Shippy	Colorado DOT	(719) 546-5734
Greg Severance	City of Pueblo, CO	(719) 545-5480

SPRINGFIELD, VIRGINIA INTERSTATE INTERCHANGE

Description:

This integration project addresses one aspect of the integration of infrastructure in the Springfield Interstate improvement project. The ITS integration component to be addressed is the enhanced use of video imagery to include video transfer between agencies and organizations. The specific project focus is to provide video feeds between existing VDOT Smart Traffic Centers and others, such as the Fairfax County Public Safety Dispatch Center and the Springfield Interchange Office of the State Police.

A smaller, companion effort to this video sharing initiative is to ensure that the existing incident management plan and manual are current and up-to-date. A review of the existing regional plan and manual will be conducted to determine any needed revisions, especially as they may relate to the Springfield Interchange project and video sharing.

Project Location: Springfield, Virginia

Partner(s): Virginia DOT; Fairfax County

Start Date: September 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $395,735

Estimated Total Project Cost: $795,735

***Contacts*:**

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
James Robinson	Virginia DOT	(804) 786-6677

STATE OF TEXAS STATEWIDE SOFTWARE AND SYSTEMS INTEGRATION CENTER-TO-CENTER COMMUNICATIONS PROJECT

Description:

This is a multi-phase project begun in February 1999 with Phase I funded solely through TxDOT. Phase I of the Center-to-Center Communications (C2C2) Project, when deployed will provide data on freeway conditions on a graphical map for a combined Dallas/Ft. Worth ITS Internet Web site. Phases II and III were awarded in FY 99 using the FY 99 "State of Texas" earmarked funding in the FY 99 ITS Integration Program appropriations. Phase II of the C2C2 pilot project will extend the data server capabilities beyond freeway conditions to support coordinated incident management, information sharing, and remote device monitoring and control. The final phase of the project is intended to deploy an effective, reusable and fully interoperable C2C2 system in other ITS regions throughout Texas. This final phase will include additional development and integration activities to extend the multi-modal, multi-center and interoperable capabilities of the data server and related subsystems.

FY 2002 ITS Integration Program funding earmarked for this project continues the multi-phased effort to deploy Center-to-Center (C2C) communications capabilities in I-35 Corridor from Dallas/Fort Worth to Laredo, and the I-10 Corridor from Houston-to-El Paso. C2C communications capabilities previously developed for Dallas and Fort Worth will be deployed in the seven Traffic Management Centers (TMCs) within these two corridors. This will enable the TMCs to achieve higher levels of effectiveness in delivering commercial vehicle operations and traveler information services along these corridors. An added benefit will be the development of a statewide Traveler Information System that will serve commercial vehicle operators and the traveling public outside of the designated corridors. Traveler information from all TMCs with C2C communications capabilities will be fed to a centralized statewide Website accessible to the public.

Project Location: Dallas/Fort Worth, Texas

Partner(s): FHWA, Texas DOT

Start Date: February 1999

***End Date*:** April 2005

Estimated Total ITS Funds: $1,271,107

Estimated Total Project Cost: $2,542,213

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Charlie Brindell	Texas DOT	(512) 416-3268

SYRACUSE, NEW YORK ADVANCED TRANSPORTATION MANAGEMENT SYSTEM

Description: This project will deploy an Advanced Transportation Management and Traveler Information System in the vicinity of the State Fair Interchange in Syracuse, involving I-690, Route 695, and key connecting roadways. The system is expected to include technologies such as variable message signs and highway advisory radio and state-of-the art traffic monitoring and a management system to operate this area.

Project Location: Syracuse, New York

Partner(s): New York State DOT

Start Date: October 1998

***End Date*:** December 2004

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,250,000

***Contacts*:**

Jerry Zell	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 228
Jim Lawler	New York State DOT	(315) 428-4312	

TACOMA AREA INTER-AGENCY COMMUNICATIONS COORDINATION

Description: This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The setting for this project is the I-5 Tacoma, WA corridor. While the area currently has a network of surveillance cameras and traffic flow detection devices, the communications system through which data and images are transmitted has shortcomings. This project will provide an improved communications link to ITS devices in the Tacoma area that will alleviate problems with the existing network. The first phase of this project is installation of fiber optic infrastructure to remove WSDOT's dependency on Tacoma's fiber optics. Follow on phases will install fiber optic cable to existing ITS devices along the corridor and transit and maintenance operations centers. The final component of the project will deploy a closed circuit TV camera on I-5, and expand traffic monitoring sites on I-5.

Project Location: Tacoma, Washington

Partner(s): FHWA, Washington State DOT, Washington State Patrol, Pierce Transit and Pierce County Public Works, City of Tacoma Fire Dept.

Start Date: September 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $413,650

Estimated Total Project Cost: $827,300

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
John Nisbet	WSDOT	(360) 357-2670

TRAFFIC MANAGEMENT CENTER ENHANCEMENT

Description:

This project is the FY 2000 Tacoma, Washington ITS Integration Program earmark. The Olympic Region presently has a network of surveillance cameras and traffic flow detection devices along the Interstate 5 Tacoma corridor. The images and data from these devices reach the Tacoma Traffic Management Center via analog microwave and voice graded phone line. While these methods of data transmission work, they have inherent problems. The analog microwave is subjected to distortion due to inclement weather and vegetation obstructing the microwave path. In addition, the limitations of the microwave system allow for the transmission of only three of the nine camera images at one time. The disadvantage with the phone service is the monthly service fees and dependency upon an external agency. The phone service also limits the expansion capability of the detection system.

The Olympic Region is proposing that the FHWA ITS Integration funds be used to construct fiber optic links from the Tacoma TMC to WSDOT fiber on I-5 and a fiber optic link from WSDOT fiber on I-5 to City of Tacoma Fiber in the SR16 Interchange vicinity. These funds would also be used for fiber optic equipment to be used at the existing WSDOT ITS locations and software revisions at the Tacoma TMC to integrate VMS sign control with CCTV control. The use of the FHWA funds and WSDOT matching funds would be divided into the following projects:

Phase 1: Fiber optic equipment for existing ITS sites. This project is required to convert the existing microwave signals from these elements to fiber.

Phase 2: Fiber optic cable link from WSDOT fiber on I-5 to the Tacoma Traffic Management Center. This project is necessary to better utilize existing ITS elements as well as to transmit this information to other agencies.

Phase 3: Video end equipment for the City of Tacoma Fire Station and fiber optic link to the existing City of Tacoma fiber network. This project will allow the City of Tacoma direct access to the Olympic Region ITS information.

Phase 4: Variable Message Sign control software. This project will enable the operators at the Tacoma TMC to control existing VMS signs and CCTV sites from one terminal.

Project Location: Tacoma/Puyallup, Washington

Partner(s): FHWA, Washington State DOT, City of Tacoma Fire Dept, Washington State Police

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $393,211

Estimated Total Project Cost: $1,260,211

Contacts:

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
John Nisbet	Washington State DOT	(360) 357-2670

Transit Management Systems

COMPUTER INTEGRATED TRANSIT MAINTENANCE AND ENVIRONMENT (CITME)

Description: The project, funded in previous years, will provide transit properties with the tools to assist in modernizing their maintenance operations. This $1 million earmark will be used to implement the system designed in Phase I in the bus operations area. The functional specifications for this system have been developed by a research team led by South Carolina Research Associates (SCRA) for installation at the Greater Cleveland Regional Transit Authority's bus and rail maintenance facilities. SCRA expects that CITME will reduce the costs of transit maintenance by 15-25 percent. Current funding will be used to procure software/hardware necessary to install ITS systems in Cleveland's bus operations division. Funding for the third phase, if available, will be used to procure and/or design hardware/software for rate and facilities operations.

Project Location: Cleveland, Ohio

Contractor(s): Greater Cleveland Regional Transit Authority, South Carolina Research Associates (SCRA)

Start Date: October 1997

***End Date*:** December 2003

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $2,000,000

***Contacts*:**

Stewart McKeown	FTA Headquarters, TRI-12	(202) 366-0244
Michael York	Greater Cleveland Regional Transit Authority	(216) 566-5101
Richard Rentz	SCRA	(843) 760-3241

CHICAGO SMART INTERMODAL SYSTEM

Description: The Chicago Transit Authority (CTA) is deploying their Bus Emergency Communications System (BECS) and Bus Service Management System (BSMS). The BECS is a comprehensive communications base designed to support more effective delivery of bus service. New two-way voice and data radio system, and location capabilities are the main features of BECS. Under the BSMS, CTA is installing additional hardware and software modules to support Computer-Aided Dispatch (CAD) software, transit priority movements at five signalized intersections, electronic traveler information way-side signs at two major bus stops, and enhanced data reporting system. Modules are being installed only on buses assigned to the 77th street garage.

Project Location: Chicago, Illinois

Partner(s): City of Chicago Department of Public Works and Department of Streets and Sanitation

Start Date: July 1994

***End Date*:** March 2003

Estimated Total ITS Funds: $490,000

Estimated Total Project Cost: $3,640,000

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841
Yazeed Khayyat	Chicago Transit Authority	(312) 432-8006

DALLAS AREA RAPID TRANSIT PERSONALIZED PUBLIC TRANSIT

Description: Dallas Area Rapid Transit (DART) is testing flexible-route buses on a regional crosstown route in the Dallas metropolitan area to determine if flexible service can increase ridership. By integrating DART's existing Automatic Vehicle Location (AVL) system and an off-the-shelf Computer Aided Dispatch (CAD) software, slack in a bus' schedule can be calculated. If there is sufficient slack, a fixed-route bus may deviate and pick up off-route passengers at a designated location. DART's Geographical Information System (GIS) is used to identify the exact location of the off-route passenger pick-up point. The maximum route deviation is one mile.

Project Location: Dallas, Texas

Partner(s): Dallas Area Rapid Transit (DART), University of Texas at Arlington, and Texas Southern University

Start Date: September 1994

***End Date*:** March 2003

Estimated Total ITS Funds: $391,560

Estimated Total Project Cost: $391,560

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841
Koorosh Olyai	DART	(214) 749-2866

ARLINGTON, VIRGINIA TRANSIT PRIORITY AND EMERGENCY VEHICLE PREEMPTION

Description:

The principal goal of this project is to improve the capacity and increase operational efficiency of the Transit Priority and Emergency Vehicle Preemption system along Columbia Pike and elsewhere in the County as funding allows. In addition, the project will allow the expansion of SCOOT traffic control along major traffic corridors. By reducing congestion and providing reliable information for travelers to make better travel decisions, effective capacity and efficiency are enhanced and environmental impacts reduced.

A flexible and integrated system is the crucial element of this project. The objective of this project is to ensure the harmony of public transit system along jurisdictions. Columbia Pike corridor links Fairfax County with Arlington County. Public transport will benefit greatly from the integration of systems. Transit agencies can provide faster, convenient, safe and flexible services with this system. Based on a bus performance relative to schedule and the vehicle's planned route, plus the destinations and connection requirements of the passengers, traffic signal timing can accommodate the schedule needs. A special green wave to get the bus back on schedule can be implemented. Using a seamless transit system in the region enhances the mobility and safety of the operation.

Personal mobility and convenience will be enhanced and the new control system will increase transit automation and predictability. The ability to use energy more efficiently and reduce environmental costs through the use of advance technology will be achieved effectively. More efficient system reduces travel times and more efficient administration of the transportation system enables productivity gains across the system.

Project Location: Arlington, Virginia

Partner(s): Virginia DOT; Arlington County, VA; Virginia Polytechnic Institute; George Mason University

Start Date: September 1999

***End Date*:** June 2004

Estimated Total ITS Funds: $593,602

Estimated Total Project Cost: $1,187,204

***Contacts*:**

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
Tom Bellamy	Arlington County Traffic Engineering Division	(703) 228-3722

CENTRAL CONTROL FACILITY COMMUNICATIONS & SYSTEM MODIFICATIONS

Description:

This project is the FY 2000 ITS Integration Program earmark for San Francisco, California. This project is a preliminary stage in the design and construction of a new Central Control Facility for the San Francisco Municipal Railway. The Central Control Facility is the communications nerve center for all modes of transit operated by the City/County of San Francisco. The earmarked funds will be allocated to contract with a consulting firm to develop specifications for a Replacement Radio System.

The scope of the specification will include analyses of alternatives which meet the Municipal Railway's objective and requirements and phasing for the project. There are seven deliverables to satisfy project completion.

Project Location: West Portal, San Francisco, CA

Partner(s): FTA, Metropolitan Transit Agency, Department of Parking and Traffic, Police and Fire Department, Metropolitan Transportation Commission

Start Date: September 2001

***End Date*:** January 2005

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $983,026

***Contacts*:**

Jeffrey Davis	FTA Region 9	(415) 744-2726
Patty Devlieg	San Francisco Municipal Railway	(415) 554-3465

CITY OF BROWNSVILLE-BUS ITS PROJECT

Description:

This project is the FY 2002 ITS Integration Program for Brownsville, Texas. This project seeks to address public transportation shortfalls in the City of Brownsville. Identified shortfalls include inefficient scheduling of passengers on paratransit service, inadequate coordination between fixed route transit operations and paratransit operations, lack of optimal routing on transit and paratransit services, lack of Web presence for the transit system, maintenance-related slow reaction times, and congestion caused by deficient routing patterns. The Brownsville Urban System (BUS) will integrate the operations centers of public transportation provided by fixed route transit and demand-response paratransit. Fixed route transit and paratransit systems will integrate into a wide area network connected to the Internet.

Primary project activities to address these limitations include:

- Deployment of Automatic Vehicle Location (AVL) systems and Mobile Data Terminals (MDT) on all revenue-generating vehicles in both the paratransit and transit fleets. The AVLs and MDTs will support real-time communication with the main operations center.

- Establishment of a computerized dispatching and management center to monitor and control the entire fleet. Dispatchers will have the capability to monitor fleet vehicles during both revenue-generating hours and deadhead hours, communicate directly with drivers, and monitor passenger parameters (such as movements and counts).

- Upon completion of the integration of the paratransit and fixed route transit fleets, BUS will link the transit operations center with the City servers/networks at the Brownsville Public Library. Through installation of T-1 lines and software acquisition, passengers will be able to view real-time transit information over any Internet access source, schedule trips on demand-responsive service, upload comments and suggestions, and track bus movements.

Project Location: Brownsville, Texas

Partner(s): FHWA, City of Brownsville-Brownsville Urban System (BUS), Brownsville Public Library

Start Date: September 2002

***End Date*:** April 2004

Estimated Total ITS Funds: $206,830

Estimated Total Project Cost: $413,660

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Norma Zamora	City of Brownsville-BUS	(956) 541-4881

CLARK COUNTY C-TRAN VAST IMPLEMENTATION

Description:

This project is the FY 2002 ITS Integration Program earmark for Clark County, Washington. This is a multi-phased project designed to introduce ITS technologies at the Clark County Transit Authority (C-TRAN) as a participant in Vancouver Area Smart Trek (VAST), the partnership of County-Public transportation agencies. Project funding will implement automated vehicle location (AVL) and automated passenger counting (APC). These are foundation modules upon which subsequent transit improvements can build. The Bus Locating System Project will install AVL equipment on all transit vehicles in the C-TRAN fleet. The AVL equipment will communicate via radio channels to the transit operations center where bus locations will be displayed on system-wide locator maps. A computer-aided dispatch (CAD) application will be used to track the movement of buses to analyze schedule adherence, transfer points and route inefficiencies.

The passenger-counting project will install APC equipment on all transit vehicles in the fleet. APC equipment senses passengers as they board and depart vehicles, and either stores or communicates the data to the transit operations center. These data will be analyzed to identify route inefficiencies.

Project Location: Clark County, Washington

Partner(s): FHWA; Washington State DOT; Oregon DOT; Clark County, WA; Clark County Public Transportation Benefit Area (C-TRAN); Southwest Washington Regional Transportation Council; City of Vancouver, WA; City of Camas, WA

Start Date: September 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $827,318

Estimated Total Project Cost: $1,654,636

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550	
Dale Miller	C-TRAN	(360) 696-4494	Ext. 7457

CLEVELAND, OHIO TRANSPORTATION MANAGEMENT AND INTEGRATED COMMUNICATIONS CENTER

Description:

This project is the FY 1999 ITS Integration Program earmark for Cleveland, OH. Funding was obligated in January 2001. The Greater Cleveland Regional Transit Authority (GCRTA) is implementing a passenger counter system. The system which integrates a communications system with a computer network will enable real-time monitoring of ridership trends from a central location as well as gathering information, on a regular basis, to support more efficient use of resources without incurring added labor costs. The system will enable data gathering on stop-by-stop level of detail.

The following capabilities will result from this system integration effort include, but are not limited to:

- The ability to provide real-time ridership monitoring on at least 20% of GCRTA service at all times.

- Passenger overloads in schedule service and for special events can be monitored, and managed with rapid response strategies.

- Special event management will be streamlined through "instant replay" of events as they occur.

- Improved scheduling of resources, and elimination of the maintenance of unnecessary service levels.

Project Location: Cleveland, Ohio

Partner(s): FTA, Ohio DOT, Greater Cleveland Regional Transit Authority (GCRTA), Cuyahoga County

Start Date: January 2001

***End Date*:** June 2003

Estimated Total ITS Funds: $791,470

Estimated Total Project Cost: $1,581,024

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841
Henning Eichler	Greater Cleveland Regional Transit Authority	(216) 566-5038

COLUMBUS, OHIO ITS INTEGRATION - PHASE I

Description: This project constitutes part of Phase I of a regional ITS infrastructure deployment and integration plan. Phase I includes deployment of a traffic signal prioritization system on a portion of the Central Ohio Transit Authority's main routes and assessing the effectiveness of the system. Real-time transit information will be provided in selected central business district bus stop locations. Inherent in this real-time component is the installation of an automated vehicle locator (AVL) system on a portion of the Authority's fleet. The AVL system will be utilized for both the signal priority and the real-time transit information systems.

Project Location: Columbus, Ohio

Partner(s): Central Ohio Transit Authority, City of Columbus, Ohio DOT, Mid-Ohio Regional Planning Commission, Columbus Airport Authority

Start Date: May 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $791,470

Estimated Total Project Cost: $1,595,213

***Contacts*:**

Jim Buckson	FHWA Ohio Division, HDA-OH	(614) 280-6846
Khaled Shammout	Central Ohio Transit Authority	(614) 275-5837

CORPUS CHRISTI, TEXAS AUTONOMOUS VEHICLE DISPATCHING

Description: This project is the FY 2001 ITS Integration Program earmark for the Corpus Christi, Texas region. Federal funding for the project was approved in June, 2002. The project expands on a FY 2000 earmark focused on integrating transit vehicle dispatching, operations, transit management, and transit administration through employment of Autonomous Dial-A-Ride Transportation (ADART). The project will increase the ADART service from two-to-twelve vehicles in service. Added capabilities to be deployed as components of this project are automatic transit fare collection and an advanced passenger notification system.

Project Location: Corpus Christi, Texas Region

Partner(s): FHWA, FTA, Texas DOT, Corpus Christi Regional Transportation Authority, City of Corpus Christi, Nueces County Department of Public Safey, Corpus Christi Metropolitan Planning Organization

Start Date: June 2002

***End Date*:** September 2003

Estimated Total ITS Funds: $793,615

Estimated Total Project Cost: $1,587,230

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Linda Watson	Corpus Christi Regional Transportation Authority	(361) 289-2712

FITCHBURG, MASSACHUSETTS-MONTACHUSETT REGIONAL TRANSIT AUTHORITY ITS INTEGRATION

Description:

The principal objective of the Montachusett Regional Transit Authority (MART) ITS Integration Program is to enhance and expand transportation and transit mobility throughout the MART service area and beyond. In order to achieve this objective, MART will use existing services offered by MART in urban and rural areas to provide enhancements to existing transit services, traveler information systems and newly developed ITS projects.

The main focus of the project will be the use of computerized systems to enhance management and deployment of demand responsive and fixed route services. This project will use the existing vehicle fleet and transit management system for fixed route, paratransit and demand responsive dispatching. The new initiatives to be pursued include design and implementation of a Global Positioning System-based Automated Vehicle Locating System complemented by Geographic Information System mapping for real-time dispatching and management.

A second feature of the project is the implementation of a traveler information system using transit vehicles as probes. Through establishment of information exchange mechanisms between local and state government agencies and the media, MART will serve as a public information center supported by web sites and toll free telephone services.

Project Location: Fitchburg, Massachusetts-Montachusett Area

Partner(s): Massachusetts Highway Department, Montachusett Regional Transit Authority (MART), Montachusett Regional Planning Agency, Massachusetts Bay Transit Authority

Start Date: September 1999

***End Date*:** November 2003

Estimated Total ITS Funds: $395,735

Estimated Total Project Cost: $791,470

***Contacts*:**

William Wiggins	FTA Headquarters, TRI-11	(202) 366-0255	
Mohammed Khan	MART	(978) 345-7711	Ext. 2223

RIVERSIDE COUNTY TRANSIT ITS DEMONSTRATION

Description:

The Southern California Association of Governments (SCAG) in association with the Riverside County Transportation Commission (RCTC), the Riverside Transit Agency (RTA), and SunLine Transit Agency have developed a demonstration program which will test the application of ITS technologies for providers of public transportation. Specifically the goal of this demonstration will be to test ITS system applications on transit operations, establish the standards and criteria for open environment technology, assess transit operational productivity increases from such applications, evaluate cost effectiveness, and identify the means, methods and actions required to implement and integrate ITS technologies into traditional fixed route transit, demand responsive transit, and non-traditional transit services such as smart shuttles. The demonstration has three primary objectives: (1) Enhanced customer information (which integrates customer information with system dispatching through the use of real-time information); (2) Fare collection and operational performance (through the use of telemetric monitoring of on-route/time performance and ridership can be gathered in real-time); (3) Vehicle telemetry (automated monitoring of critical vehicle safety and maintenance systems). The FY 99 Integration Program funding will be used to fund the demonstration program which will test and quantify system-wide transit productivity improvements.

Project Location:

Riverside County, California

Partner(s):

Southern California Association of Governments (SCAG); Riverside County Transportation Commission (RCTC); Riverside Transit Agency (RTA); SunLine Transit Agency

Start Date:

October 1999

***End Date*:**

June 2004

Estimated Total ITS Funds:

$791,496

Estimated Total Project Cost:

$3,000,000

***Contacts*:**

Gloria Stoppenhagen	FHWA LA Metro Office	(213) 202-3955	
Bob Huddy	SCAG	(909) 396-5757	Ext. 223
Ric Kaczerowski	RTA	(909) 565-5102	

SMARTBUS

Description:

This project is the FY 2002 ITS Integration program earmark for Chattanooga, Tennessee. The Chatttanooga Area Regional Transportation Authority will use integration funding for projects across a wide spectrum including:

- Improved scheduling accuracy.

- Improved on-time performance.

- Improved passenger information on the Web, at stops and on-bus.

- Real-time engine monitoring, crash data systems, digital recording, voice monitoring, and an ignition/drive train locking system.

Project Location: Chattanooga, Tennessee

Partner(s): FTA, FHWA, Tennessee DOT, Chattanooga Area Regional Transportation Authority (CARTA), City of Chattanooga

Start Date: September 2002

***End Date*:** March 2006

Estimated Total ITS Funds: $1,654,637

Estimated Total Project Cost: $3,309,274

***Contacts*:**

Michael Smart	FHWA Tennessee Division, HPR-TN	(615) 781-5775
Aaron Frank	CARTA	(423) 629-1411

SOUTH SHORE COORDINATED TRANSIT SYSTEM

Description:

This project is the FY 2000 ITS Integration Program earmark for Lake Tahoe, CA/Stateline, NV. The project will expand the deployment of kiosks from 20 to 45 locations to improve customer access to the South Shore Coordinated Transit System (CTS). The CTS project will deploy ITS transit infrastructure across jurisdictions of two states, two counties and a city. The system will incorporate the private transit resources of five casinos and one ski resort. The Coordinated Transit System will involve centralized operation of a fleet of 51 vehicles. Ultimate project objective is to achieve a dispatching and customer service system that receives customer trip requests, processes them and provides a real-time trip solution or dispatches a vehicle to satisfy the request through the use of Automated Vehicle Location, Computer-aided Dispatching and Advanced Traveler Information.

Utilizing satellite based technology, the 51-vehicle fleet will be monitored as to the real-time location of each vehicle. Variable rate polling strategies will be used to assist in determining the best available demand response vehicle for assignment to new ride requests. In addition, fixed route, flex route and deviated route vehicles will be monitored in order to facilitate timed transfers to and from the demand response element, and the reporting of "next bus" and schedule adherence information to customers traveling from standard "bus stop" locations.

The expanded network of kiosks, dedicated touch tone telephones and the public telephone network will enable customers to access the computer dispatching system and enter requests for transit service.

Computer-Aided Dispatching completes the technical approach by processing the vehicle location information and the passenger ride requests then, matching the most appropriate vehicle, based on its location and the destinations of passengers already on-board, with the service expectations of new passengers requesting rides.

Project Location: South Lake Tahoe, CA/Stateline, NV

Partner(s): FTA, City of South Lake Tahoe, Tahoe Transportation District, Tahoe Regional Planning Agency, South Shore Transportation Management Association, Coordinated Transit System Management Company

Start Date: September 2000

***End Date*:** January 2004

Estimated Total ITS Funds: $393,211

Estimated Total Project Cost: $4,589,580

***Contacts*:**

Jeffrey Davis	FTA Region 9	(415) 744-2726
Dick Powers	SS/TMA	(530) 542-6076

ST. LOUIS, MISSOURI

Description:

This project is the FY 2001 ITS Integration Program earmark for St. Louis, MO. The objectives of this project are increasing public transportation ridership, and improving customer satisfaction among current transit riders. The strategies to be implemented to achieve project objectives include providing traveler information, improving reliability, and enhancing quality of service and accountability. Interagency sharing of real-time transit information among regional stakeholders is expected to provide secondary benefits in improved traffic flow, transit vehicle mobility, and improved safety.

Along with the Bi-State Developing Agency (BSDA), Illinois Department of Transportation (IDOT), and East-West Gateway Coordinating Council (EWGCC), the Missouri Department of Transportation (MoDOT) has been developing and implementing various elements of an Intelligent Transportation System (ITS) in the St. Louis area. This includes the installation of roadway devices, such as detectors, cameras, and dynamic message signs, Automatic Passenger Counter systems on buses and lightrail trains, and incident response operations.

Included in the project is the broadening of a regional mapping system available for application by MoDOT, BSDA, IDOT, and EWGCC. This will allow all agencies to have access to a common base map and a multitude of informational layers. In addition, the project will develop and install an Automated Vehicle Location (AVL) real time passenger information system on transit express buses traveling across city, county, and state boundaries. This information will be utilized by BSDA to minimize passenger wait times and vehicle delays, increase ridership, and improve rider satisfaction. In addition, the project will integrate the traffic flow data into existing MoDOT and IDOT transportation management systems.

The freeway system has existing vehicle detectors, cameras, and dynamic message signs. Additional devices will be installed with other future projects. The data, such as travel times and speeds, available through the AVL system will strengthen the information from the existing traffic and transit systems. Transit schedules are dependent on estimated travel times for each bus route. The project will allow more dynamic scheduling along these routes. Travelers can be given estimated bus expectancy times at each stop by way of dynamic message signs and kiosks. This can have a large impact on the reliability aspect of the transit system and can encourage more ridership. The data from the traveling buses will be integrated into and used in the existing freeway management system. This project element will develop and install the necessary hardware and software for an AVL system, including specifications for equipment, testing and acceptance of the system.

The other element of the project integrates mapping systems already in place by each agency. The project includes the inventory of existing mapped features and technologies used to accomplish that, identifying a system map accessible and useable by all agencies, and developing and installing the necessary software and hardware interfaces to incorporate the informational layers needed by each agency. This commonality will ensure accurate exchanges of information as they relate to incidents, freeways, and transit.

Project Location:

St. Louis, Missouri Regional Area

Partner(s):

FHWA, FTA, Missouri DOT, Illinois DOT, Bi-State Developing Agency (BSDA), East-West Gateway Coordinating Council (EWGCC)

Start Date:

September 2001

***End Date*:** September 2003

Estimated Total ITS Funds: $396,807

Estimated Total Project Cost: $793,614

Contacts:

Kevin Ward	FHWA Missouri Division, HDA-MO	(573) 636-7104
Bill Kalt	FTA Region 7	(816) 329-3927
Teresa Krenning	Missouri DOT	(314) 340-4317

STATE OF ILLINOIS; PARKING MANAGEMENT SYSTEM DEPLOYMENT

Description:

This is a discretionary project of the FY2000 ITS Deployment Program for the State of Illinois.

GOALS AND OBJECTIVES

The goals of this project are to improve transit mobility. Ultimately, ridership is expected to increase with improved customer satisfaction as a direct result of enhanced transit parking information. This is to be accomplished through the detailed design, deployment, testing, and evaluation of a prototype Parking Management System (PMS) in the northeastern Illinois metropolitan area. The PMS project is part of a larger effort to develop Advanced Traveler Information Systems (ATIS) in the Gary-Chicago-Milwaukee (GCM) Corridor.

SCOPE OF WORK

The Regional Transportation Authority (RTA) is investigating the initial procurement of a PMS to solve the complex problem of collecting information on parking availability at park 'n' ride lots, providing parking information on freeway and arterial routes along transit corridors by way of Dynamic Message Signs (DMS) in close proximity to park 'n' ride lots, and providing directional signage to guide motorists to facilities with available parking spaces. The PMS shall feature central data warehouses at each RTA Service Board (CTA, Metra, and Pace). These central data warehouses, known as Service Board Hubs, will provide storage of archival data (for planning use) as well as provide the conduit for information provision to the GCM Gateway Regional Traveler Information System. The Service Board Hubs shall be directly connected to an Illinois Transit Hub, the key intermediary between the PMS and the GCM Corridor. The Illinois Transit Hub connects with the GCM Gateway Traveler Information System via a direct connection to the Illinois Gateway Hub. This work order will fund at least one site of the PMS deployment.

The PMS will provide real-time parking availability information to the GCM Gateway via Service Board Hubs, the Illinois Transit Hub, and the Illinois Regional Hub. This technology-independent interface will provide information about full parking facilities to other ATIS in the GCM area.

Project Location: Gary-Chicago-Milwaukee Corridor

Partner(s): FHWA, FTA, Illinois DOT, Regional Transportation Authority of Illinois

Start Date: August 2001

***End Date*:** June 2004

Estimated Total ITS Funds: $300,000

Estimated Total Project Cost:

$600,000

Contacts:

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
Doug Gerleman	FTA Region 5	(312) 886-1621
David Zavattero	Illinois DOT, ITS Program Office	(847) 705-4800
Duana Love	Regional Transportation Authority of Illinois	(312) 917-1563

STATE OF IOWA ITS DEPLOYMENT PROJECT

Description:

This statewide ITS transit project consists of two phases: 1) development of a statewide transit ITS deployment plan which includes a statewide transit ITS assessment and development of a regional architecture for transit; and 2) the deployment of transit ITS in selected areas. At the same time as the assessment and deployment plan are being developed, the Iowa DOT will be conducting a statewide communication plan study funded through the Iowa DOT ITS plan.

Phase I. Development of a Statewide Transit ITS Deployment Plan

The assessment and plan development for a statewide ITS transit plan is integral to supporting an integrated transit ITS system. The first project phase will include three parts: 1) assessment of Iowa's 35 transit systems needs and capabilities, what's available in the market, best practices and products used; 2) development of a statewide transit architecture; and 3) development of a statewide transit deployment plan including benefits and costs for implementing various modules for Iowa's transit agencies. The statewide deployment plan will develop a strategy for using ITS technologies as a means of improving integration of information and communications to provide better transit service across the state. Specific projects will be defined for each transit agency and prioritized, with a timeline for deployment developed.

Phase II. Transit ITS Deployment

Specific projects for deployment will be identified in Phase I of the project. It is anticipated that some type of communication infrastructure will be needed to help integration in urban and rural areas and to help ease deployment in the rural and urban areas.

ITS funding displayed below is the transit portion of the earmark.

Project Location: State of Iowa

Partner(s): FHWA, FTA, Iowa DOT, Iowa Public Transit Association

Start Date: September 2001

***End Date*:** December 2003

Estimated Total ITS Funds: $1,907,440

Estimated Total Project Cost: $3,814,880

***Contacts*:**

Jim Brachtel	FHWA Iowa Division, HDA-IA	(515) 233-7305
Bill Kalt	FTA Region 7	(816) 329-3920
Peggi Knight	Iowa DOT, Dir. Ofc. of Public Transit	(515) 239-1530

TRANSIT COMMUNICATIONS SYSTEM INTEGRATION WITH FRANKLIN COUNTY PUBLIC SERVICE

Description:

This project is a component of the FY 2000 Central Ohio Earmark. The Central Ohio Transit Authority (COTA) has been an active participant in regional ITS-related initiatives. COTA initiatives include pursuing the implementation of transit ITS systems and the establishment of a regional transportation management system. In the course of replacing its radio system and upgrading its communications capabilities, COTA will integrate its communications system with the Franklin County Public Safety System. The County already possesses the infrastructure to accommodate communications needs between law enforcement and emergency services agencies, as well as with the cities of Columbus, Westerville, and Upper Arlington. With the added capability of direct communications between COTA bus operators with safety and emergency services providers, there will be a significant increase in fleet management, fleet safety and reduced incident response times.

Integration activities have been completed. An evaluation report is under development and anticipated by the end date depicted below.

Project Location: Columbus, Ohio

Partner(s): FHWA, Central Ohio Transit Authority, Franklin County Public Services

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $300,000

Estimated Total Project Cost: $616,355

***Contacts*:**

Jim Buckson	FHWA Ohio Division, HDA-OH	(614) 280-6846
Mark Nawrath	Central Ohio Transit Authority	(614) 308-4373

WESTCHESTER/PUTNAM COUNTIES, NEW YORK REGIONAL TRANSIT OPERATIONS INFORMATION INTEGRATION

Description: This project will develop and improve the multi-agency integration of information and communications systems to support effective use of Advanced Public Transportation Systems for multi-agency transit service coordination. Implementation of the Transit Communications Interface Profiles (TCIP) will establish the foundation for providing a schedule database maintenance system (SDMS), provide for multi-agency interoperability using SDMS and other legacy regional transit schedule maintenance software, create an AVL integration/coordination test-bed, and incorporate the exchange of TCIP compliant transit operations information.

Project Location: Westchester and Putnam Counties, New York

Partner(s): New York State DOT, New York City DOT, Metropolitan Transit Authority, TRANSCOM

Start Date: September 1999

***End Date*:** January 2004

Estimated Total ITS Funds: $915,734

Estimated Total Project Cost: $1,831,464

***Contacts*:**

Arthur O'Connor	FHWA New York Division NYC Metro Office	(212) 668-2206

Incident Management Systems

FY 2001 STATE OF NEBRASKA EXTENSIBLE MARK-UP LANGUAGE (XML) SOFTWARE

Description: This project is a component of the FY 2001 ITS Integration Program earmark for Nebraska. The project objective is the development and implementation of an Extensible Mark-up Language (XML) application capable of automatic transmission of incident data. Project implementation will provide automated incident-related data exchange between Nebraska State Patrol and Nebraska Department of Roads (NDOR). Benefits resulting from this project include significantly decreased incident response times through increased transmission speed and improved quality control of message accuracy. Improved center-to-center communications resulting from this application offers significant potential for other ITS applications.

Project Location: Nebraska

Partner(s): FHWA, Nebraska Department of Roads (NDOR), Nebraska State Patrol, UNO-PKI

Start Date: February 2002

***End Date*:** February 2004

Estimated Total ITS Funds: $55,000

Estimated Total Project Cost: $110,000

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977
Jim McGee	NDOR	(402) 471-1811

INCIDENT MANAGEMENT FOR SAFE, SECURE AND PRODUCTIVE TRANSPORTATION SYSTEMS

Description: This project is the FY 2002 ITS Integration Program earmark for Albany, New York. The project focuses on incident management by integrating advanced traveler information (ATIS) with a regional Transportation Management Center (TMC). The ATIS projects currently being implemented were initiated with FY 2000 and FY 2001 earmarked funding. The TMC will monitor traffic data on area interstates (I-90/I-787) employing deployed monitors, cameras, cellular 911 and patrol vehicles. The project is to create an incident management "test bed" comprised of deployed traveler information systems and TMC capabilities. The test bed will extend along I-90/I-787, NY Route 378, and US Route 4 between East Greenbush and Troy, New York. The test bed facility will constitute an ITS laboratory equipped to permit real-time experimentation and training on the use of ITS devices under real-world traffic conditions. Construction is scheduled to begin in 2005.

Project Location: Albany, New York

Partner(s): FHWA, FTA, NYSDOT, New York State Police, Capital District Transportation Authority, Capital District Transportation Committee, Rensselaer Polytechnic Institute

Start Date: September 2002

***End Date*:** August 2004

Estimated Total ITS Funds: $1,654,636

Estimated Total Project Cost: $3,309,272

***Contacts*:**

Mike Schauer	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 236
Jeffrey Marko	NYSDOT	(518) 474-6215	

LAW ENFORCEMENT INTELLIGENT NETWORK SYSTEMS

Description:

The project objectives are to design and build a system that allows end-to-end data communication among Alliance members. The system consists of an Officer Assistant and Patrol Car Assistance connected by an Internet communications network. The proposed implementations will increase officer safety, improve mobile communications, enhance data sharing, and promote financial and life cycle efficiency of law enforcement communications technology. Both hardware and software will be designed in a modular fashion, using intelligent systems approaches and as far as possible, to use commercial off the shelf (COTS) components. The proposed units used by the officer in the field will be able to place relevant information near at hand to a variety of data sources. This is achieved by developing the units in an evolutionary manner through a series of levels starting with low bandwidth and at each phase increment, to increase bandwidth and graphical data transmission capability. This conforms with the ITS Guidelines in that the communications technology is separate from the architecture, allowing evolutionary advances as technology advances. ITS activities in Incident Management and Emergency Management will be high priority categories. As long as this path is standards based, not only will communication and cooperation among the Alliance members be enhanced, but a replicable model for other parts of the state and nation will be established and become the model for law enforcement technology overall.

Project Location: University of Alabama, Huntsville

Partner(s): University of Alabama in Huntsville, Huntsville-Madison County 9-1-1 Center, City of Huntsville

Start Date: September 1999

***End Date*:** January 2003

Estimated Total ITS Funds: $791,469

Estimated Total Project Cost: $2,020,727

***Contacts*:**

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377	
Dr. Gary Workmann	University of Alabama-Huntsville	(256) 890-6578	Ext. 240

NEBRASKA ITS INCIDENT MANAGEMENT COORDINATION AND INTEGRATION

Description:

This project is a component of the FY 2001 ITS Integration Program State of Nebraska earmark. This project is designed to facilitate the integration and incorporation of operational changes into the Incident Management Manual resulting from ITS deployments in the Omaha Metropolitan area and the I-80 Corridor.

The need for the area Incident Management Manual is generated by the expanding deployment of both metropolitan and rural ITS infrastructure along the I-80 Corridor. The development of the manual will harmonize incident management practices in a setting where legacy systems and procedures require integration with newer ITS technologies. Emphasis will be placed on training and outreach to ensure smooth implementation of procedures outlined in the manual.

Project Location: Nebraska

Partner(s): FHWA, Nebraska Department of Roads (NDOR), Nebraska StatePatrol, Omaha, NE MPO

Start Date: December 2002

***End Date*:** October 2003

Estimated Total ITS Funds: $26,250

Estimated Total Project Cost: $52,500

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977
Jim McGee	NDOR	(402) 471-1811

SPILLWAY ROAD PROJECT

Description:

This project is the FY 2002 ITS Integration Program earmark for Rankin and Madison Counties, Mississippi. The project objective is to implement an incident management system servicing a corridor (Spillway Road) that traverses the Ross Barnett Reservoir which provides the water supply for much of the Jackson Metropolitan area. Frequent crashes on Spillway Road result in extensive traffic delays due to high traffic volumes and long response times. This project will deploy incident management system capabilities centered around video cameras installed along Spillway Road and monitoring devices in the Spillway Tower. Spillway Tower is staffed 24 hours per day providing continuous monitoring capability. Tower staff will dispatch reservoir patrol units with significantly improved response times and reduced motorist delays. This incident management capability will be integrated with Advanced Traffic Management Systems in the Cities of Jackson and Ridgeland as well as the Mississippi Department of Transportation which will upload CCTV video on its Web site.

A fiber-optic cable-based communications network will be accessible along the entire length of this project which will provide system interface and integration functionality.

Project Location: Rankin and Madison Counties, Mississippi

Partner(s): FHWA; Mississippi DOT; Pearl River Valley Water Supply District; City of Ridgeland, MS

Start Date: September 2002

***End Date*:** January 2004

Estimated Total ITS Funds: $496,391

Estimated Total Project Cost: $992,782

***Contacts*:**

Mike Cribb	FHWA Mississippi Division, HDA-MS	(601) 965-4228
Scott Carson	FHWA Mississippi Division, HDA-MS	(601) 965-4232
Phil Hunt	Pearl River Valley Water Supply District	(662) 856-6574

STATE OF IDAHO - INCIDENT RESPONSE COMPUTER-AIDED DISPATCH SYSTEM

Description: This project is a component of the FY 2000 State of Idaho Earmark. Idaho State Police are implementing a Computer-Aided Dispatch (CAD) system. This project builds on ITS in the Treasure Valley (FY 1999 earmark) by developing and installing a CAD system accessible from three Regional Dispatch Centers. FY 2000 earmarked funds were applied to the purchase and installation of the CAD. System integration with Regional Idaho State Police Dispatch Centers is in progress. Four principal tasks are involved: Communications Dispatch Center Construction; CAD Bidding Process; CAD Project Planning; and CAD Implementation.

Project Location: Boise, Idaho

Partner(s): FHWA, Idaho DOT, Idaho State Police, Idaho State EMS, Ada County Highway District Traffic Management Center

Start Date: August 2000

***End Date*:** January 2003

Estimated Total ITS Funds: $393,210

Estimated Total Project Cost: $786,420

***Contacts*:**

Ross Blanchard	FHWA Idaho Division, HDA-ID	(208) 334-9180	Ext. 112
Stan Passey	Idaho State Police	(208) 884-7314	
Jim Larsen	Ada County Highway District	(208) 387-6196	

STATE OF ILLINOIS; INCIDENT WARNING SYSTEM PILOT PROJECT FOR THE I-74 BRIDGE

Description:

This is a discretionary project of the FY2000 ITS Deployment Program for the State of Illinois.

GOALS AND OBJECTIVES

The primary goal of this project is to improve mobility. This is to be accomplished with the implementation of an incident warning system that will alleviate delays associated with incidents on the Interstate 74 (I-74) Mississippi River Bridge.

SCOPE OF WORK

The focus of this phase of the project is to design an incident detection and warning system to notify travelers of nonrecurring incidents and subsequent delays on the I-74 Mississippi River Bridge.

The incident warning system design will consider the use of advanced technologies to support incident identification, verification, response, clearance, and traveler information and examine potential incident warning system locations. To create an effective warning system, information about incidents must be promptly communicated from the location of the incident to the traveler. This information will allow travelers to change their route or allow time for delays. The study will examine ways to detect problems, inform motorists of problems, assist emergency response agencies, and manage the traffic to access alternate routes. The need to create one or more traffic management centers to coordinate and manage activities will also be examined.

The project design includes development of a project architecture based on the National ITS Architecture and the Iowa statewide system architecture.

Project Location: I-74 Bridge in Iowa and Illinois

Partner(s): FHWA, Illinois DOT, Iowa DOT

Start Date: September 2001

***End Date*:** December 2004

Estimated Total ITS Funds: $70,000

Estimated Total Project Cost: $170,000

***Contacts*:**

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
David Zavattero	Illinois DOT, ITS Program Office	(847) 705-4800
Harlan Knudson	Illinois DOT, District 2	(815) 284-5468

STATE OF ILLINOIS; PEORIA AREA I-74 TRAFFIC AND INCIDENT MANAGEMENT SYSTEM

Description:

This is a discretionary project of the FY2000 ITS Deployment Program for the State of Illinois.

GOALS AND OBJECTIVES

The goals of this project are to improve safety and mobility. This is to be accomplished with the design and implementation of a Traffic and Incident Management System for the Greater Peoria Area I-74 Corridor. This project will consider the best use of the advanced technologies to provide a traffic and incident management and traveler information infrastructure during and after the reconstruction of I-74. The potential integration opportunities will be identified in the project architecture. This project will further encourage inter-jurisdictional coordination and reduce institutional barriers. This is further detailed in the following Scope of Work.

SCOPE OF WORK

This work order provides funding for the Plans, Specifications and Estimates (PS&E) for the Stage 1 design to implement a traffic and incident management system on I-74 from the west junction of I-474 to the east junction of I-474. The PS&E phase will follow the completion of the project system architecture and conceptual design phase. The PS&E phase will include the development of preliminary, pre-final, and final plans. The completion of the PS&E phase will serve as a precursor to the ITS deployment for Stage 1 construction.

Project Location: Peoria, Illinois

Partner(s): FHWA, Illinois DOT, City of Peoria, and City of East Peoria

Start Date: May 2001

***End Date*:** June 2003

Estimated Total ITS Funds: $125,000

Estimated Total Project Cost: $250,000

***Contacts*:**

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
David Zavattero	Illinois DOT, ITS Program Office	(847) 705-4800
Roger Miller	Illinois DOT, District 4	(309) 671-3455

STATE OF IOWA - TRAFFIC ENFORCEMENT

Description:

This project is one part (Enforcement) of the FY 2001 ITS Integration Program earmark for the State of Iowa. The project will provide funding for computer hardware and peripherals to support the development of a suite of software and technologies to speed the processing of crash data known as the National Model. This project seeks to enhance the current Iowa statewide crash data reporting system through the use of automated collection and data capture tools. The operational objective is to enable on-scene officers to enter crash-related data in on-vehicle computers connected to state crash databases. Dissemination of grants to local enforcement agencies will expand the use of the National Model throughout the state, and pursue the following goals:

- Improvement of highway safety data collection and management processes.
- Increase officer efficiency by enabling automated capture, transmission and sharing of crash scene data.
- Improve data quality, and
- Enhance officer safety.

Project Location: State of Iowa

Partner(s): FHWA, Iowa DOT

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $275,000

Estimated Total Project Cost: $550,000

***Contacts*:**

Jim Brachtel	FHWA Iowa Division, HDA-IA	(515) 233-7305
Shirley Andre	Iowa DOT	(515) 237-3202

WILLIAMSON COUNTY/ROUND ROCK, TEXAS INTEGRATION PROJECT

Description:

This project is the FY 2001 Integration Program earmark for Williamson County/Round Rock. Williamson County and the City of Round Rock, Texas are linked by the I-35 and US 183 corridors. The Texas DOT has deployed a freeway corridor traffic management system along these corridors. Both jurisdictions employ computer-aided dispatch (CAD) systems to respond to incidents.

Current integration between these systems is limited to telephone technology. In recognition of the compelling need for each jurisdiction to be aware of roadway incidents in the adjoining area, this project will integrate the existing Williamson County and Round Rock CAD systems with the Texas DOT advanced traffic management system. This integration will provide County and City authorities with roadway incident information to support appropriate incident management and emergency response.

Project Location: Williamson County and City of Round Rock, Texas

Partner(s): FHWA, Texas DOT, Williamson County, City of Round Rock

Start Date: September 2001

***End Date*:** May 2003

Estimated Total ITS Funds: $198,404

Estimated Total Project Cost: $398,404

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Brian Burk	Texas DOT	(512) 832-7014

Emergency Management

DIRECT - PHASE III

Description:

This project is a follow-on phase to the Driver Information Radio using Experimental Technologies (DIRECT) operational test. This operational test deployed and evaluated several alternative low-cost methods of communicating advisory information to motorists. Alternatives employed included Radio Broadcast Data Systems FM Subcarrier, Automatic Highway Advisory, Low Power Highway Advisory Radio and cellular phones. The Michigan Intelligent Transportation Systems Center collected and fused information from various sources and generated traffic advisory updates to travelers. Phase II involved an Emergency Warning System. The emergency vehicles such as Ambulance, Police and Fire would be able to warn the travelers through the car radio, as they approach those vehicles by using a specially designed transmitter. The transmitter designed and prototyped by one of the partners in the project was using 87.9MHz frequency. FCC denied the application requesting the license due to a conflict. The FCC's disapproval of the 87.9MHz application terminated Phase II activity. Phase II remains administratively open pending receipt of a lessons learned report. Phase III resumes project activity with Michigan Department of Transportation's proposal to consider the test as a special application under the 5.9GHz dedicated frequency band which has been agreed to by the DSRC Standard Working Group. The new scope, specifications and project plans are being developed. FHWA has approved the proposed change to proceed.

Project Location: Along sections of I-75 and I-94 in the Detroit, Michigan area

Partner(s): Michigan DOT, Ford Motor Company, Federal Signal Corp., Visteon, AAA of Michigan, Smart Route Systems, Michigan Courtesy Patrol, Ann Arbor Police and Fire, and Huron Valley Ambulance Co.

Start Date: May 1999

***End Date*:** June 2004

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $2,000,000

***Contacts*:**

Larry Swartzlander	FHWA Headquarters, HOTM	(202) 366-6066
Morrie Hoevel	FHWA Michigan Division, HDA-MI	(517) 702-1834
Kunwar Rajendra	Michigan DOT	(517) 335-2893

AUTOMATED CRASH NOTIFICATION SYSTEM, UAB

Description: This project is the FY 2001 ITS Integration Program earmark for Birmingham, AL. The project, to be conducted by the University of Alabama at Birmingham, will integrate automatic crash notification technology with an organized trauma system in order to expedite identification of vehicle crashes with injuries and the delivery of appropriate medical care. The project will seek to employ remote electronic data collection by emergency medicine personnel, and then using these data, route patients to the appropriate medical facility. These features of the system will be complemented by the use of real-time collision parameters to predict the likelihood of injury in a given crash.

Project Location: Birmingham, Alabama

Partner(s): FHWA; Alabama DOT; Alabama Department of Public Health, EMS Division; University of Alabama at Birmingham; Veridian Engineering

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $793,615

Estimated Total Project Cost: $1,588,979

***Contacts*:**

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377
Loring Rue, M.D.	University of Alabama at Birmingham	(205) 975-3030

EMERGENCY MANAGEMENT INTEGRATION AND SIGNAL PREEMPTION SYSTEM

Description:

This is a discretionary project of the FY2001 ITS Deployment Program for Bloomingdale, Illinois.

GOALS AND OBJECTIVES

The primary goal of this project is to improve safety and mobility. This project will provide for the planning, implementation, operation, maintenance and monitoring of a coordinated emergency signal preemption system to increase transportation safety and efficiency. The project will enable more effective police, fire, and emergency operations throughout DuPage County.

SCOPE OF WORK

This project will provide for the deployment of preemption system improvements and development of a database map of signal preemption intersections.

The eventual goal of this program is to install and operate preemption at all signalized arterial/collector intersections within DuPage County. The other major objective of the program is to create a County-wide database map of all intersections with preemption systems. This database would then be used by all private call centers, Public Safety Access Points, and other emergency response agencies at the local, county and state level.

Project Location: Bloomingdale, Illinois

Partner(s): FHWA, Illinois DOT, DuPage County Division of Transportation

Start Date: August 2001

***End Date*:** June 2006

Estimated Total ITS Funds: $317,446

Estimated Total Project Cost: $634,892

***Contacts*:**

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
David Zavattero	Illinois DOT	(847) 705-4800
Morgan Cotten	DuPage County Division of Transportation	(630) 681-2253

EMERGENCY ROOM LINK - TUCSON, ARIZONA

Description:

This project is the FY 2001 ITS Integration Program earmark for Tucson, AZ. Emergency Room Link-Tucson (ER Link-Tucson) allows doctors to be virtually transported from a hospital emergency room into an ambulance. Emergency dispatchers are provided the capability to view incident sites to support assessment and assignment of emergency responders. Phase I of this project will enable video and voice teleconferencing between the University of Arizona Medical Center and Advanced Life Support (ALS) ambulances of the Tucson Fire Department. The system facilitates two-way audio and video communications between attending paramedics in ambulances and emergency room medical personnel at the hospital. This is accomplished using traffic control infrastructure. The use of video from a mobile platform is a new technology. This system's goals are to expedite ER medical assistance to victims, and clear crash sites as quickly as possible to reduce the potential for secondary incidents.

Project Location: Tucson, Arizona

Partner(s): FHWA, Arizona DOT, City of Tucson, Pima Association of Governments, METRO Networks, Pima County, University of Arizona Medical Center

Start Date: September 2001

***End Date*:** September 2004

Estimated Total ITS Funds: $992,018

Estimated Total Project Cost: $1,988,410

***Contacts*:**

Alan Hansen	FHWA Arizona Division, HPR1-AZ	(602) 379-3645	Ext. 108
Richard Nassi	City of Tucson DOT	(520) 791-4259	

ONONDAGA COUNTY, NEW YORK

Description: This project is the FY 1999 ITS Integration Program earmark for Onondaga County, New York. Federal funding was obligated at the end of FY 2001. Phase I of this project will enable 911 location data to be received at the Onondaga County 911 center.

Project Location: Onondaga County, New York

Partner(s): New York State DOT, Onondaga County Department of Emergency Communications, Upstate Medical University

Start Date: September 2001

***End Date*:** June 2003

Estimated Total ITS Funds: $316,580

Estimated Total Project Cost: $2,100,000

***Contacts*:**

Jerry Zell	FHWA New York Division, HTS-NY	(518) 431-4125	Ext. 228
Jay Scott	Upstate Medical University	(315) 464-4365	
Kathy McMahon-Ruscitto	Onondaga County 911	(315) 435-8628	

SEABROOK, TEXAS

Description:

This project is the FY 2001 ITS Integration Program earmark for Seabrook, Texas. Funding approval for the project was deferred to September 2002. The goal of this project is to facilitate access to closed circuit TV images by traffic management and emergency management agencies in small communities. The Greater Houston Transportation Management and Emergency Center, Houston TranStar, provides CCTV images offering great potential value to agencies in smaller cities surrounding the greater Houston metropolitan area. Access to CCTV for these communities is dependent on their ability to fund a T1 and fiber optic connection to Houston TranStar. These costs frequently exceed budget constraints.

This project will make Houston TranStar video accessible to a large number of users through the Internet. This will allow small cities and government agencies to access video without large capital outlays.

The project's implementing concept is to establish a distribution system for the images from the 300 CCTV cameras deployed on Houston's freeway system. The principal system components are:

- An encoder - a PC with video capture board and equipped with software to convert data into data packets.

- Video Gateway for video channel selection.

- Web Server to communicate the user's Web browser and initiate a connection to the video channel via the gateway.

- Video Player.

Project Location: Harris County, Texas

Partner(s): FHWA, Texas DOT, Cities of Seabrook and Webster, Bay Area Transportation Partnership (BATP)

Start Date: October 2002

***End Date*:** June 2006

Estimated Total ITS Funds: $952,337

Estimated Total Project Cost: $1,904,674

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
David Fink	Texas DOT	(713) 881-3063

SOUTHAVEN, MISSISSIPPI ITS PROJECT

Description: This project is the FY 2001 ITS Integration Program earmark for Southaven, MS. The project is focused on deployment and integration of ITS technology to improve safety and efficiency for travelers in Southaven. Two priorities will guide the project: deployment of preemptive traffic signal control; and integration of this capability within 25 signalized intersections. Public safety agencies - Fire, Police, EMS - will be the principal system users, with accompanying major safety benefits to vehicle traffic by providing safe access for emergency vehicles through heavily congested intersections.

Project Location: Southaven, Mississippi

Partner(s): FHWA, Mississippi DOT, City of Southaven

Start Date: October 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $119,042

Estimated Total Project Cost: $238,610

***Contacts*:**

Mike Cribb	FHWA Mississippi Division, HDA-MS	(601) 965-4228
Scott Carson	FHWA Mississippi Division, HDA-MS	(601) 965-4232
Jeff Altman	Mississippi DOT	(601) 359-7675
William Lancaster	Neel-Schaffer, Inc.	(662) 342-9921
Chris Wilson	City of Southaven	(662) 393-6939

STATE OF INDIANA - PROJECT HOOSIER SAFE-T

Description: This project is the FY 2001 ITS Integration Program earmark for the State of Indiana. SAFE-T is a communications modernization project designed to provide interoperable and compatible statewide, multi-agency (Federal, State, local) public safety communications capabilities. When completed the communications system will enable law enforcement, firefighters and emergency medical service providers to communicate with all agencies committed to public safety operations.

Project Location: State of Indiana

Partner(s): FHWA, Indiana DOT, Indiana Public Safety Commission

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $793,615

Estimated Total Project Cost: $1,587,230

***Contacts*:**

Dennis Lee	FHWA Indiana Division, HDA-IN	(317) 226-5351
Mark Newland	Indiana DOT	(317) 232-5523
Lester Miller	Indiana Public Safety Commission	(317) 232-8317

STATEWIDE TRANSPORTATION OPERATIONS CENTER

Description: This project is the FY 2002 ITS Integration Program Kentucky Statewide earmark. The project objective is the construction and activation of a Statewide Transportation Operations Center (STOC). The STOC will serve as the Kentucky Transportation Cabinet's focal point for dispatching Kentucky Vehicle Enforcement Officers, coordinating snow/ice removal, disaster reaction, incident management, delivering traveler information, and serving as the Commonwealth's back-up Emergency Operations Center.

Project Location: Commonwealth of Kentucky

Partner(s): FHWA, Kentucky Transportation Cabinet

Start Date: September 2002

***End Date*:** April 2004

Estimated Total ITS Funds: $1,654,637

Estimated Total Project Cost: $3,309,274

***Contacts*:**

Brent Sweger	FHWA Kentucky Division, HDA-KY	(502) 223-6743
Charles Knowles	Kentucky Transportation Cabinet	(502) 564-4556

TRAFFIC OPERATIONS CENTER-TO-EMERGENCY OPERATIONS CENTER CONNECTIVITY AND AUTONOMOUS DIAL-A-RIDE TRANSPORTATION SYSTEM IMPLEMENTATION WITH INTEGRATION

Description:

This project is the FY 2000 ITS Integration Program earmark for Corpus Christi, Texas, funding for which was obligated in 2d Qtr FY 2001. The objectives of this project are to implement an integrated ITS deployment that will increase the effectiveness of hurricane evacuation operations, improve overall mobility, reduce travel time delays and congestion on highways and arterials, foster the use of mass transit, and provide emergency service providers with real-time traffic information.

The events during a recent hurricane identified the need to coordinate emergency services and operations with real-time traffic information to improve effectiveness during evacuations and alternate traffic routing. Also identified was an opportunity to use a state-of-the-art transportation system, Autonomous Dial-A-Ride Transportation (ADART), to aid in hurricane evacuations while also improving the overall efficiency of daily transit operations.

The operations center integration component (OCIC) will provide communications and connectivity to enable the TXDOT Traffic Management Center (TMC) to supply real-time traffic video and data to the local emergency operations center. This joint effort integration will also link both the City of Corpus Christi's traffic operations center and the TXDOT TMC with jointly owned traffic signals on arterials.

Project Location: Corpus Chirsti, Texas

Partner(s): FHWA, FTA, Texas DOT, City of Corpus Christi, Regional Transportation Authority, Texas Department of Public Safety, Nueces County, Local Metropolitan Planning Organization, Local Emergency Planning Committee

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $1,179,632

Estimated Total Project Cost: $2,359,264

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Gail Lyssy	FTA	(817) 978-0550
Ismael Soto	Texas DOT (Corpus Christi District)	(361) 808-2225
Linda Watson	Regional Transportation Authority	(361) 289-2712

UNIFIED MOBILE COMMAND UNIT (SYSTEMS INTEGRATION & COMMUNICATIONS NETWORK PROJECT)

Description: This project is a component of the FY 2002 ITS Integration Program Maryland Statewide earmark. Maryland's application of ITS is known as the Coordinated Highways Action Response Team (CHART). The CHART Program employs computer technology, electronics and communications, safety, and security systems to manage surface transportation facilities. This project will procure and deploy a mobile command and communications vehicle to support statewide incident response and management coordination among all responding agencies. This vehicle will be fully integrated with and build on current CHART operations by promoting inter-agency operational coordination and cooperation by providing a versatile platform from which responding agencies can operate during emergency situations.

Project Location: Maryland

Partner(s): FHWA, Maryland State Highway Administration, Maryland State Police, Maryland Emergency Management Agency, Maryland Transportation Authority, Baltimore City Traffic Operations, District of Columbia Department of Public Works

Start Date: September 2002

***End Date*:** June 2004

Estimated Total ITS Funds: $275,000

Estimated Total Project Cost: $550,000

***Contacts*:**

Breck Jeffers	FHWA Maryland Division, HPT-MD	(410) 962-4342	Ext. 129
Michael Zezeski	Maryland State Highway Administration	(410) 582-5605	

Electronic Toll Payment

NEW YORK CITY TOLL PLAZA SCANNERS

Description: This project will fund installation of readers for EZ-PASS tags (the transponders used to electronically collect tolls) along the highway portions that are currently not covered by the ongoing TRANSCOM project. These include: the Belt Parkway linking JFK airport, Van Wyck Expressway linking La Guardia Airport and leading to the Triboro Bridge, Whitestone Expressway, Grand Central Parkway, Clearview Parkway, Cross Island Parkway. The information collected from the transponders will be integrated and coordinated with other regional systems to improve incident response and allow traffic management across a broader area of metropolitan New York City.

Project Location: New York City, New York

Partner(s): New York State DOT

Start Date: October 1998

***End Date*:** April 2003

Estimated Total ITS Funds: $1,100,000

Estimated Total Project Cost: $1,375,000

***Contacts*:**

Arthur O'Connor	FHWA New York State Division NYC Metro Office	(212) 668-2206
Fred Lai	New York State DOT	(718) 482-4733

Electronic Fare Payment

ORLANDO REGIONAL ALLIANCE FOR NEXT GENERATION ELECTRONIC PAYMENT SYSTEMS (ORANGES)

Description:

This field operational test will evaluate the implementation of an integrated electronic payment system (EPS) for multiple transportation service providers.

The centerpiece of ORANGES is a financial clearinghouse that will track financial transactions, and implement funding settlement and reconciliation using procedures agreed to by the participating agencies. The financial clearinghouse will be linked to a network of terminal devices enabling customers to replenish their accounts. Regional interoperability will be enabled by establishing interfaces with participating agencies' autonomous revenue collection systems.

Services participating in the electronic payment system include a highway toll authority, a transit operator, and a city parking system. The three participating agencies will offer participating travelers integrated payment accounts using their own preferred payment media.

Project Location: Orlando, Florida

Partner(s): FTA, Orlando-Orange County Expressway Authority, City of Orlando Parking Bureau, Central Florida Regional Transportation Authority (LYNX), PBS&J, Touch Technology International, Inc., Leap Frog Smart Products, Inc., University of Central Florida Cooperative Smart Card Laboratory

Start Date: March 2001

***End Date*:** September 2003

Estimated Total ITS Funds: $2,300,000

Estimated Total Project Cost: $5,500,000

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678

CENTRAL PUGET SOUND REGIONAL FARE COORDINATION "SMART CARD" PROJECT

Description:

This FY 2000 earmarked project is a collaboration of seven Central Puget Sound transportation agencies whose objective is to create a seamless, multi-modal fare collection system using contactless smart card technology. When implemented, riders will be able to board buses, ferries, light rail or commuter trains on a cashless, ticketless basis. Seven agencies will link through the use of one fare card for all systems, a network of readers, back office systems and a centralized revenue and data clearinghouse. The project seeks to increase ridership and customer convenience; increase agency revenues; reduce operating costs or demonstrate added value for cost increases. Although the project is based on a contactless smart card, it is expected that a dual interface card (one that functions in contact and contactless modes) will emerge as the final choice. The key objectives which will measure success are: Increased ridership and customer convenience; increased agency revenues; and reduced operating costs, or delivery of added value for cost increases.

The FY 2001 ITS Integration Program earmark for the Greater Seattle Metropolitan Area provided an additional $1,984,036 to project funding.

The "Estimated Project Cost" figures depicted below on the ITS line include FY 2001 funding, and additional local match funding is reflected in the "Total Estimate Costs." The project completion date reflects schedule adjustments required to accommodate added FY 2001 funding.

Project Location: Greater Seattle Metropolitan Area

Partner(s): FTA, WSDOT, Community Transit, Everett Transit, King County Metro, Pierce Transit, Sound Transit, Washington State Ferries, Kitsap Transit

Start Date: September 2000

***End Date*:** December 2004

Estimated Total ITS Funds: $4,421,941

Estimated Total Project Cost: $25,586,279

***Contacts*:**

Linda Gehrke	FTA Region 10	(206) 220-4463
Candace Carlson	King Co. DOT"Metro" Transit	(206) 684-1562

DELAWARE SMART CARD

Description:

This project is now a component of the Delaware Valley Multimodal Electronic Payments System Demonstration Program, managed by Delaware DOT, and begun in June, 2001. The project, formerly known as Wilmington, Delaware Smart Dart, initially was designed to operationally test smart card technology in a transit application in Wilmington, Delaware. A smart card fare collection system was to be developed for the Wilmington bus fleet. An Employee Commute Option (ECO) program was to be created that allowed employers to provide transit benefits through the smart card system which facilitates the administration of transit benefits. The ECO program was developed as a response to the Clean Air Act of 1992, and the program was intended to allow participating employers to qualify for the tax credits based on the level of employee participation in the program. The smart card was to be issued by a local bank as part of a larger pilot program testing an open-system stored-value bankcard. The project, under this initial design was not initiated. The project has been expanded to encompass the phased multimodal implementation of an electronic payment system (EPS) in the Delaware Valley Region (Philadelphia-Wilmington-Dover) to create a seamless transportation payment network. The initial phase will introduce smart card use on the DART First State transit system.

Project Location: Delaware Valley Region

Partner(s): FTA, Delaware DOT, Delaware Authority for Regional Transit (DART) First State, Southeastern Pennsylvania Transportation Authority (SEPTA)

Start Date: July 1994

***End Date*:** January 2004

Estimated Total ITS Funds: $1,191,424

Estimated Total Project Cost: $2,179,155

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678
Robert Uggla	Edwards and Kelcey	(610) 701-7000

NORTHERN VIRGINIA REGIONAL FARE SYSTEM

Description:

This project supports the efforts of the Northern Virginia Transportation Commission to design a Regional Fare System. The system will integrate the fare collection operations of separate commuter rail, bus, and rail-commuter operators. The project follows on the Washington Metropolitan Area Transportation Authority's decision to implement the recently demonstrated "Go Card" throughout Washington, DC's Metrorail system. Building on this successful demonstration, this project will assist the transportation agencies of the Washington, DC area to integrate their transit fare and transportation payment systems.

The project was initiated in June 1997, and placed in a “hold” category for several months pending reconciliation with similar regional projects. It was started up for the second time in November 2001.

Project Location: Northern Virginia

Partner(s): Northern Virginia Transportation Commission, Washington Metropolitan Area Transportation Authority

Start Date: November 2001

***End Date*:** October 2003

Estimated Total ITS Funds: $200,000

Estimated Total Project Cost: $4,000,000

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678
Sharmile Samarasinghe	Northern Virginia Transportation Commission	(703) 524-3322

SMARTRIP REGIONAL CUSTOMER SERVICE CENTER

Description:

This is a FY 2000 ITS Integration Program earmark for the Washington, D.C. Metropolitan Region. Funding for the project was approved in FY 2002, and the project was initiated in FY 2002. The purpose of this project is to establish a Regional Customer Service Center (RCSC) to perform multiple management, distribution and reconciliation tasks to support the SmarTrip card. Since its introduction in early 1999, the Washington Metropolitan Area Transit Authority's (WMATA) SmarTrip card has achieved significant market penetration in the Metrorail system and associated parking facilities. This initial success has established the foundation for implementation of a regional fare collection system. The first step will be the expansion to WMATA's bus system which, like the rail system, operates in DC and surrounding counties in Virginia and Maryland. The contract to accomplish this has been expanded to include commuter buses, light and heavy rail systems. With the deployment of this multi-agency use of the SmarTrip card comes an extensive requirement to manage the distribution, provide customer service and conduct transaction reconciliation for the participating agencies. The RCSC will link the various fare collection systems into a single reporting and management complex.

Project Location: Washington, D.C. Metropolitan Region

Partner(s): WMATA; MD Mass Transit Administration (MTA); VA Department of Rail and Public Transportation (VDRPT)

Start Date: September 2002

End Date: September 2003

Estimated Total ITS Funds: $2,332,105

Estimated Total Project Cost: $12,500,000

Contacts:

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678
Craig Maxey	WMATA	(202) 962-1791

Highway Rail Intersection

RAILROAD HIGHWAY CROSSING - LONG ISLAND, NY

Description: This project will support the development of a prototype integrated uniform warning system for use at railroad/highway grade crossings.

Project Location: Long Island, New York

Partner(s): New York State DOT

Start Date: April 1996

***End Date*:** December 2003

Estimated Total ITS Funds: $5,875,000

Estimated Total Project Cost: $9,531,250

***Contacts*:**

Mike Schauer	FHWA New York Division, HTS-NY	(518) 431-4125	Ext. 236
Seth Edelman	New York State DOT	(518) 457-1046	

Regional Multimodal Traveler Information

DYNAMIC TRAFFIC ASSIGNMENT AND SYNTHETIC ORIGIN AND DESTINATION MATRICES

Description:

This study will develop a deployable Real-Time, Traffic Estimation and Prediction System (TrEPS). The system shall be able to serve as an effective integrator between ATMS and ATIS and shall be deployable in real time in a large and congested network in which recurrent and non-recurrent congestion may occur. A TrEPS system should have the following broad functional capabilities:

-- Estimate and predict traffic network states;

-- Provide route guidance;

-- Offer departure time and mode choice (e.g., transit vs. auto) advisory to travelers;

-- Interface to traffic control systems.

A real-time TrEPS system will perform the above functions in real-time by making the best use of the information collected from surveillance systems and other information sources including ATIS.

The project is to be conducted in multiple phases. Phase I work focuses on the design, development, functional testing, and laboratory testing of the TrEPS system. Upon completion of Phase I, Oak Ridge National Laboratory (ORNL) will conduct an independent evaluation of laboratory software acceptance evaluation; a traffic management center (TMC) evaluation of TrEPS; and a metropolitan planning organization (MPO) evaluation of the planning version of TrEPS (TrEPS-P). Phase II work is to enhance the prototype TrEPS based on the lessons learned from the laboratory evaluation and experiments at TMCs and MPOs. Also rollout plans for TrEPS and TrEPS-P will be addressed under Phase II. Phase III is to enhance TrEPS for integration with wide-area surveillance and to provide coordinated ITS services. In this phase, there is also a need to develop TrEPS software distribution and maintenance plans, form partnerships for further research, development and deployment.

Two parallel Phase I research contracts were awarded to Massachusetts Institute of Technology and the University of Texas at Austin through ORNL in October, 1995. Both Phase I projects were completed by October 1998. Phase 1.5A work on the laboratory evaluation is underway.

ORNL provides technical management support to the FHWA with the design, development, and testing of the DTA system.

Project Location: Oak Ridge, Tennessee

Contractor(s): Department of Energy and Oak Ridge National Laboratory

Start Date: June 1994

End Date: December 2003

Estimated Total ITS Funds: $8,669,689

Estimated Total Project Cost:

$8,669,689

Contacts:

Henry Lieu	FHWA - TFHRC, HRDO-03	(202) 493-3273

MIAMI REAL-TIME PASSENGER INFORMATION SYSTEM

Description: This project will support the efforts of the Miami-Dade Transit Agency (MDTA) to provide customers with an automated trip planning capability, including real-time on-line route and schedule information. Informational kiosks will be established at major rail and bus transfer points. In consultation with the FTA, a post-implementation evaluation will be accomplished.

Project Location: Metropolitan Dade County, Florida

Partner(s): FTA, Miami-Dade Transit Agency (MDTA)

Start Date: July 1995

***End Date*:** March 2003

Estimated Total ITS Funds: $400,000

Estimated Total Project Cost: $400,000

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841
Isabel Paroun	MDTA	(305) 375-4504

NEW YORK CITY METROPOLITAN TRANSPORTATION AUTHORITY TRAVEL INFORMATION SYSTEM

Description:

The Travel Information System will supplement a pilot project for a GPS-based bus locating system. This bus locating system will involve approximately 200 buses that will be assigned in the CBD of Manhattan. These will include North/South and East/West destinations. This proposed program will outfit 250 major bus stops with travel information devices. The three types of information devices will be dispersed as follows:

* 50 interactive kiosks will be installed at major bus stop points. This may include numerous transfer points between railway routes, subway routes and other bus routes. Highly visible and tourist areas will be utilized for two reasons: 1) maximum usage of the kiosk and 2) provide vital information to the tourist who is unfamiliar with the transit system.

* 100 video monitors will be mounted at major bus stops with transfer points to the other bus routes or subway lines. Voice announcements will also be available for the visually impaired. These monitors will be mounted in vandal-proof housings. Some storefront window locations (i.e., banks, department stores) will be made available.

* 100 variable message signs will be installed at high volume bus stops (i.e., near schools, hospitals and shopping centers).

* 50 vehicles will be equipped with message displays/interactive stations and appropriate voice announcements for the visually impaired.

Project Location: New York Metro Area

Partner(s): FTA, NYDOT, NYC Transit Authority

Start Date: September 1994

***End Date*:** March 2003

Estimated Total ITS Funds: $3,000,000

Estimated Total Project Cost: $5,029,460

***Contacts*:**

William Wiggins	FTA Headquarters, TRI-11	(202) 366-0255	
Mike Schauer	FHWA New York Division, HDT-NY	(518) 431-4125	Ext. 236

ADVANCE CORRIDOR TRANSPORTATION INFORMATION CENTER

Description:

ADVANCE (Advanced Driver and Vehicle Advisory Navigation Concept) was an operational test designed to evaluate the performance of a large-scale in-vehicle navigation and dynamic route guidance system. Vehicles used in this project served as probes, providing real-time traffic information to a Traffic Information Center (TIC). Upon completion of the operational test, the ADVANCE Steering Committee concurred in the further development and modification of the ADVANCE TIC (application phase of ADVANCE) so it can serve as a prototype Corridor Transportation Information Center (C-TIC) for information dissemination efforts for the Gary-Chicago-Milwaukee (GCM) ITS Priority Corridor. Presently, real time information is available for portions of the system in Illinois and Wisconsin. Information on daily lane closures on the entire expressway system is already available at the C-TIC. Real time information on incidents from *999 (a cellular phone based motorist aid system), Illinois State Police-District 15 and Northwest Central Dispatch (a regional seven community 911 computer aided dispatch system) is automatically entered into the C-TIC. A prototype of the Illinois State Toll Highway Authority I-PASS advanced traffic management system has been developed to provide travel time information for I-355 as part of the C-TIC effort and expansion of this system to the entire tollway network is currently underway. In 2001 the C-TIC transitioned to the new Gateway Traveler Information System. The Gateway system consists of a central Gateway Hub and the Illinois, Indiana, and Wisconsin Gateway Hubs to provide multi-modal, real time transportation information to operators and users of the transportation system serving the three-state GCM corridor.

Project Location: Northeastern Illinois

Partner(s): Indiana DOT, Illinois DOT, Wisconsin DOT, Illinois State Toll Highway Authority (ISTHA)

Start Date: October 1996

***End Date*:** June 2004

Estimated Total ITS Funds: $9,864,839

Estimated Total Project Cost: $12,331,049

***Contacts*:**

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
Dave Zavattero	Illinois DOT	(847) 705-4800

ATIS IMPLEMENTATION AND INTEGRATION THROUGHOUT THE I-90 PHASE 2 CONNECTOR/ITS TEST BED LABORATORY TRANSPORTATION NETWORK

Description:

This project combines the FY 2000 and FY 2001 ITS Integration Program earmarks for Rensselaer County, New York. Funding for both fiscal years was obligated in mid CY 2001. The FY 2000 earmark objective is to implement an Advanced Traveler Information System (ATIS) and agency information exchange network throughout the I-90 Phase 2 Connector/ITS Test Bed Laboratory transportation network of Rensselaer County, NY. The system will be designed to satisfy information needs of highway travelers and transit users as well as transportation operating agencies. Project features include:

- Investigating wireless communications technologies to achieve cost-effective travel data collection from various modes.

- Instrumenting the transportation infrastructure and collecting travel data from commuters.

- Analyzing collected data and producing traveler information.

- Integrating the traveler information with transportation modes and transportation management centers.

The FY 2001 earmark builds on this base and focuses on use of wireless technologies as the basis for traveler information through the use of cellular telephones for traffic surveillance. E-911 cellular telephone emergency service notification is added as a source of ATIS. The coverage area is also expanded to include the majority of the transportation network serviced by the regional Transportation Management Center. Funding indicated below are totals for both fiscal years. The breakout is as follows:

ITS Funding (earmarks)

FY 2000: $786,421

FY 2001: $396,807

Total Funding

FY 2000: $986,421

FY 2001: $806,807

Project Location: Rensselaer County, New York

Partner(s): FHWA, New York DOT, Rensselaer Polytechnic Institute, Capital District Transportation Authority

Start Date: July 2001

***End Date*:** December 2003

Estimated Total ITS Funds: $1,183,228

Estimated Total Project Cost:

$1,793,228

Contacts:

Mike Schauer	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 236
Paul Cuerdon	New York DOT	(518) 474-6277	

BALTIMORE REGIONAL MULTIMODAL TRAVELER INFORMATION SYSTEM (MMTIS)

Description:

This project is one component of the FY 2000 State of Maryland ITS Integration Program earmark. The project will be a public/private partnership that will fill the traveler information gap along the Baltimore portion of the I-95 corridor, integrate the various types of multi-modal information that is collected in the region, and integrate with traveler information systems in the nearby regions of Washington, DC and Philadelphia, PA. Currently, traveler information is not provided on a large scale in the Baltimore region. All Baltimore MMTIS will ultimately be integrated within the system. The public will also be able to access general information for free.

Data will be collected from the field equipment, consolidated in the MMTIS database, and disseminated via the MMTIS. Multi-modal information will be collected from public and private sources, fused, and disseminated to travelers. Disseminating technologies could include telephone, Internet, kiosks, pagers, and other applicable state-of-the-practice and emerging technologies. The project will develop interfaces between the infrastructure components and the MMTIS database and will also develop the user interfaces through which the information will be disseminated in a timely manner. With the participation of private partners, the Baltimore MMTIS will be implemented in a comparatively short time frame and will significantly improve operation of the region's transportation network. The project funds will promote timely transmission of valuable, free traveler information.

The FY 2001 ITS Integration earmark for this project added $500,000 to support continuation activities. Funding amounts depicted below include FY 2001 earmarked funding.

Project Location: Baltimore, Maryland

Partner(s): FHWA; Maryland SHA; PennDOT; DEDOT; Baltimore Metropolitan Council; MD Transportation Authority; MD Aviation Administration, MD Port Administration; Mass Transit Administration; City of Annapolis; Departments of Public Works in Counties of: Ann Arundel, Baltimore, Carroll, Howard

Start Date: September 2000

***End Date*:** December 2008

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $4,800,000

***Contacts*:**

Breck Jeffers	FHWA Maryland Division, HPT-MD	(410) 962-4342	Ext. 129
Mike Zezeski	Maryland SHA	(410) 787-5605	
Eileen Singleton	Baltimore Metropolitan Council	(410) 732-0500	Ext. 1033

CAPITAL WIRELESS INTEGRATED NETWORK-BALTIMORE EXPANSION STUDY

Description: This project uses FY 2001 Deployment Program funds to conduct a study examining the feasibility of expanding the Capital Wireless Integrated Network CapWIN project to Baltimore. The study will determine the technology modifications needed for expansion, and the data types available from Baltimore region agencies. Cost estimates and a deployment/integration schedule will be developed.

Project Location: Baltimore, Maryland

Partner(s): FHWA, Maryland DOT, Maryland State Highway Administration, Transportation Authority, Aviation Administration, Port Administration, Mass Transit Administration, Motor Vehicle Administration, and State Police; Baltimore Metropolitan Council; City of Annapolis and Baltimore City Public Works, Police and Fire Departments; Counties of Anne Arundel, Baltimore, Carroll, Harford, and Howard Public Works, Police, and Fire Departments

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $50,000

Estimated Total Project Cost: $100,000

***Contacts*:**

Breck Jeffers	FHWA Maryland Division, HPT-MD	(410) 962-4342	
Eileen Singleton	Baltimore Metropolitan Council	(410) 732-0500	Ext. 1033

DADE COUNTY, FLORIDA ADVANCED TRAVELER INFORMATION SYSTEM

Description: This project seeks to implement multi-modal, real-time traveler information for the Miami-Dade, Broward, Palm Beach tri-county region within one year of contract award to an Independent Service Provider (ISP). The ISP will have wide latitude in selection of approaches for integrating public and private infrastructure and supporting resources to deliver timely and accurate regional traveler information.

Project Location: Miami-Dade, Broward and Palm Beach Counties

Partner(s): Florida DOT; Miami-Dade, Broward and Palm Beach Counties; City of Miami; TAI-RAIL; MDX

Start Date: March 2000

***End Date*:** March 2005

Estimated Total ITS Funds: $791,470

Estimated Total Project Cost: $5,291,470

***Contacts*:**

Chung Tran	FHWA Florida Division, HDA-FL	(850) 942-9650	Ext. 3041
Arnie Fernandez, Jr.	Florida DOT	(305) 470-5238	

HAMPTON ROADS ADVANCED TRAVELER INFORMATION SYSTEM AND ITS OUTREACH PROGRAM

Description:

This project constitutes the FY 2000 ITS Integration Program Commonwealth of Virginia earmark. The project is a public-private partnership designed to take advantage of private sector capital, technology and its ability to react quickly to the market to deliver information to travelers in and around the Hampton Roads metropolitan area. This service will collect data from multiple sources (both public and private), fuse the appropriate data elements, and will distribute the information through various media outlets.

The system will be developed during the first twelve months of the integration project, and will be operated by the Virginia Department of Transportation's (VDOT) private partners for a minimum of five years. Under this partnership, the traveling public receives traveler information at no cost. The Department receives significant benefits and services including:

- A real-time map for traffic management and traffic operations that includes sensor data for surface streets and freeway sections not yet covered by VDOT sensors.

- An automated telephone call-in system to disseminate information to the traveling public.

- Four years of operational support to the telephone system where Iteris (a private sector provider) provides data supporting the dissemination of traveler information via the telephone system.

- An NTCIP-compliant interface to the Roadway Information System (RIS) so that the RIS (regional incident information sharing system) can be discarded as an interim solution.

- $1 million in cable television advertising.

The private partners will distribute traveler information through a combination of different media outlets including Internet, cable television, commercial radio, kiosks, highway advisory telephone, broadcast television, and personal digital assistants.

ITS OUTREACH PROGRAM

VDOT also proposes to develop a comprehensive ITS Outreach Program as part of the ITS Integration Component of the ITS Deployment Program. This project is truly an integration project, focused on educating, training and informing key constituencies and bringing new participants to the table.

VDOT proposes to utilize and tailor existing FHWA/USDOT materials to communicate with key constituencies such as:

- local governments;

- Planning District Commissions;

- regional civic organizations; and

- the general public.

The project's goal is to increase awareness of VDOT's Smart Travel transportation technology program and to educate and inform the various constituencies regarding the Department's statewide ITS strategic plan, system architecture and concept of operations.

Earmarked funding for the Hampton Roads ATIS project is $600,000 and ITS Outreach is $120,684. Total matching funds for the ATIS project is $6,586,684 and for the Outreach component $120,684.

Project Location:

Hampton Roads Metropolitan Area, Virginia and Statewide

Partner(s): FHWA, VA Department of Transportation; Iteris, Inc. Team

Start Date: June 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $721,000

Estimated Total Project Cost: $7,428,052

Contacts:

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
James Robinson	Virginia DOT	(804) 786-6667

INGLEWOOD, CALIFORNIA ATMS PROJECT

Description:

The Inglewood, California, ATMS project builds upon existing transportation resources and encompasses the installation of a sophisticated traffic control center that controls traffic signals, conducts traffic surveillance using closed circuit TV, and provides up to the minute information on traffic to travelers through kiosks, changeable message signs, cable TV and the Internet. The project will reduce travel time in the area 20-30% before and after NBA basketball games, NHL hockey games, concerts, and other special events at the Forum, Hollywood Park Racetrack and Casino.

FY 99 funding enabled phase II objectives to include upgrading the city's existing Traffic Control Center to an advanced Traffic Management Center (TMC); installation of 30,000 plus feet of fibre optic cable for improved communication and closed circuit TV; installation of between 7 and 11 CCTV cameras; installation of a new traffic signal system in the TMC; installation of user interactive kiosks at major venues in the city. The project will integrate these components with other regional systems from agencies such as the City of Los Angeles and Caltrans District 7.

Project Location: Inglewood, California

Partner(s): California DOT; City of Inglewood, CA; Los Angeles County Metropolitan Transportation Authority

Start Date: September 1997

***End Date*:** September 2005

Estimated Total ITS Funds: $2,687,204

Estimated Total Project Cost: $5,000,000

***Contacts*:**

Gloria Stoppenhagen	FHWA LA Metro Office	(213) 202-3955
Charng Chen	City of Inglewood, CA	(310) 412-4316

KANSAS CITY, MISSOURI INTERMODAL COMMON COMMUNICATIONS TECHNOLOGY

Description: This project will result in the design and integration of ITS intermodal communication technology for deployment as part of the ITS Transportation Management System under development in the Kansas City area.

This project's development schedule has been delayed by a requirement to integrate subsystems with a related project - Kansas City Scout Freeway Management System - whose software package development schedule has been extended.

Project Location: Kansas City, Missouri

Partner(s): Missouri DOT, Kansas City Metropolitan Planning Organization

Start Date: October 1998

***End Date*:** April 2004

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,250,000

***Contacts*:**

Bob Thomas	FHWA Missouri Division, HDA-MO	(573) 636-7104
Ray Webb	Missouri DOT	(816) 622-0520
John Holmes	Missouri DOT	(816) 622-0685

MARKET STREET AND PENNSYLVANIA CONVENTION CENTER PASSENGER INFORMATION CENTER

Description: This project will fund the design and construction of a comprehensive "way finding" system that provides transit system directional signage. It will utilize on-line computerized electronic information signage and graphics, with user-activated personalized service regarding both the resources of Philadelphia and specific information on public transit facilities.

Project Location: Philadelphia, Pennsylvania

Partner(s): Redevelopment Authority of Philadelphia

Start Date: October 1998

***End Date*:** March 2003

Estimated Total ITS Funds: $325,000

Estimated Total Project Cost: $450,000

***Contacts*:**

Carmine Fiscina	Philadelphia FHWA Metro Office, PMO-PA	(215) 656-7111
Janet Kampf	Philadelphia FTA Metro Office	(215) 656-7070
Christopher Kern	Redevelopment Authority of Philadelphia	(215) 209-8659

NATIONAL CAPITAL REGION CONGESTION MITIGATION

Description:

The effort consists of a variety of projects as described below:

* $1.25 million for the development of a suburb-to-suburb bus service between Tysons Corner and Bethesda (Administered and managed by FTA);

* $1.5 million toward the deployment of a travelers' information center in Prince George's County in Maryland (End Date: 6/2003; Total Funds: $1.875M);

* $250,000 for a multi-jurisdictional transportation telecommunications study (End Date: 6/30/03; Total Funds: $312,500);

* $500,000 to enhance video surveillance in Montgomery County and the Tysons area to support the Tysons to Bethesda bus service (End Date: 6/30/03; Total Funds: $625,000);

* $750,000 for George Mason University to assist in the Partners-in-Motion project as well as to establish an ITS implementation center at the university (Administered and managed by R&D);

* $1.25 million to enhance surveillance on the Virginia portion of the capital Beltway, and enhance VDOT's existing advanced freeway management system software in Northern Virginia (End Date: 4/2003; Total Funds: $1,562,500);

* $100,000 for the development of an electronic fare payment services implementation plan for the National Capital Region (End Date: 4/2003; Total Funds: $125,000); and

* $400,000 to provide support for the region's ITS Task Force activities (End Date: 4/2003; Total Funds: $500,000).

Project Location:

Washington, D.C., Metropolitan Area

Partner(s):

Virginia DOT, Maryland State Highway Administration, Montgomery Co., Maryland Department of Public Works, and Prince Georges County Maryland Department of Public Works

Start Date: October 1998

***End Date*:** June 2003

Estimated Total ITS Funds: $6,000,000

Estimated Total Project Cost: $7,000,000

***Contacts*:**

Breck Jeffers	FHWA Maryland Division, HDA-MD	(410) 962-4342	Ext. 129
Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357	
James Robinson	Virginia DOT	(804) 786-6677	
Mike Zezeski	Maryland SHA	(410) 787-5859	
Rick Gordon	Prince Georges County DPW	(301) 883-5700	
Emil Wolanin	Montgomery County DPW	(301) 217-2208	

PENNSYLVANIA TURNPIKE TRAVELER INFORMATION SYSTEM

Description:

This project will provide for the development and deployment of a traveler information system for the Pennsylvania Turnpike. Components to be deployed include highway advisory radio systems, variable message signs, closed circuit television, and a central computer control system capable of controlling all new as well as existing equipment. The project will include retrofitting existing equipment as necessary to enable integration with the central computer control system.

The TEA-21 ITS Integration Program is providing earmarked funding to build on and expand this project. The FY 2000 ITS Integration Program earmark for the Pennsylvania Turnpike (under the project title Pennsylvania Turnpike Commission ITS Phase 5) added $1,966 million in ITS funding complemented by local matching funds for a total of $3.466 million in FY 2000. FY 2000 funding was obligated in June 2001, and will focus on providing motorists with information on traffic, weather and emergency conditions. In addition to the integration of several technologies providing enhanced traffic flow monitoring, Phase 5 will deploy dynamic signs at, or near interchanges, and road weather information system sites.

Project Location: Pennsylvania

Partner(s): FHWA, Pennsylvania DOT/Pennsylvania Turnpike Commission

Start Date: September 1997

***End Date*:** February 2003

Estimated Total ITS Funds: $10,966,000

Estimated Total Project Cost: $14,716,000

***Contacts*:**

Jessie Yung	FHWA Pennsylvania Division, HIT-PA	(717) 221-4422	
Tim Scanlon	Pennsylvania Turnpike Commission	(717) 939-9551	Ext. 5590

REGIONAL INTEGRATED TRANSPORTATION INFORMATION SYSTEM (RITIS)

Description:

This project is the FY 2002 ITS Integration Program earmark for the Washington, D.C. Metropolitan area. Working through the National Capital Transportation Planning Board at the Metropolitan Washington Council of Governments, the Washington Metropolitan region will integrate existing transportation information and management systems in Virginia, Maryland, and the District of Columbia into a Regional Integrated Transportation Information System (RITIS). The project will incrementally integrate data from existing Transportation Management Centers and their associated information systems over a three-year period with specific objectives and deliverable items in each year.

RITIS collects data of regional interest and fuses these data into regional information that can be used to enhance regional traveler information and transportation management functions performed by member agencies.

RITIS advances regional data fusion and the employment of real-time regional information in support of transportation management, traveler information, emergency preparedness, emergency response and other regional priorities. The project develops a regional ITS Data Archive, a Virtual Private Network using the Internet Protocol for sharing video images and transportation data of regional interest, and a Regional Data Management Center.

Project Location: Washington, D.C. Metropolitan Area

Partner(s): FHWA, Metropolitan Washington Council of Governments (COG); Virginia DOT; Maryland State Highway Administration; DC Department of Public Works; Washington Metropolitan Area Transit Agency; Montgomery County Department of Public Works

Start Date: March 2003

***End Date*:** March 2006

Estimated Total ITS Funds: $1,655,000

Estimated Total Project Cost: $3,310,000

***Contacts*:**

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
Andrew Meese	MWCOG	(202) 962-3789

REGIONAL TRAVELER INFORMATION CENTER (RTIC)

Description:

This project constitutes the FY 1999 ITS Integration Program earmark for Amherst, MA. The Federal ITS funding was carried over to FY 2000 and obligated in September 2000. This project will design, build and operate a Regional Traveler Information Center (RTIC) located at the University of Massachusetts in Amherst that will collect and disseminate traffic, transit and tourist information for government and public use. The proposed RTIC will serve as the platform (using national ITS standards) to collect and consolidate static and real time information from public and private sources and coordinate its dissemination through an internet based portal using the latest computer and communications technology. The mission of the RTIC will be to enable transportation and public safety agencies to share information on traffic incidents, weather, construction, and special events in order to enhance their respective transportation or safety management functions, and to provide relevant information to the traveling public that would benefit from this information. The establishment of the RTIC at the University will lay the foundation for integrating ITS projects (both institutionally and technically) currently being deployed in western Massachusetts, and will serve as a live laboratory for transportation research and education using the combined resources of the University of Massachusetts Transit System and the University of Massachusetts Transportation Center (UMTC). The University of Massachusetts Transit Center currently acts as a service provider to the Pioneer Valley Transit Authority and has been in continuous operation since the early 1970's. The UMTC is responsible for coordinating all transportation-related outreach and research conducted by the University.

Project Location: Amherst, Massachusetts

Partner(s): FHWA, Massachusetts Highway Dept., UMass Transit System, Pioneer Valley Planning Commission, Franklin Regional Council of Governments, Pioneer Valley Transit Authority, Montachusett Regional Transit Authority

Start Date: September 2000

***End Date*:** December 2003

Estimated Total ITS Funds: $791,463

Estimated Total Project Cost: $1,582,925

***Contacts*:**

Edward Silva	FHWA Massachusetts Division, HDA-MA	(617) 494-2253
Russ Bond	Massachusetts Highway Dept.	(617) 973-7358
Paul Shuldiner	Univ. of MA Transportation Center	(413) 545-2688

SPOKANE REGIONAL DATA WAREHOUSE

Description:

This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The project is closely tied to projects being integrated through the Spokane Regional Traffic Management Center (SRTMC). This project will develop a Regional Data Warehouse to facilitate implementation of a Regional Traveler Information Website and/or a Regional Traffic Management System. Such regional ITS applications must be able to share traffic and transportation data continually collected and stored within individual agency systems. Using the SRTMC as an information and communications hub, individual jurisdictions can maintain their basic operational structures, but achieve interoperability through networking. Development of a regional traffic/weather data warehouse will support the following benefits:

- Provide single source access for all available regional transportation/weather data.

- Support a common format for data to normalize Internet service provider and agency data management.

- Define and support data sharing.

This project starts the Regional Data Warehouse development process by conducting an analysis of database architecture options, and developing a design.

Project Location: Spokane Metropolitan Area, Washington

Partner(s): FHWA, Washington State DOT, Spokane Regional Transportation Council (SRTC), Spokane County, City of Spokane, Spokane Transit Authority (STA)

Start Date: September 2002

***End Date*:** June 2003

Estimated Total ITS Funds: $206,825

Estimated Total Project Cost: $413,650

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Kenneth Knutson	WSDOT	(509) 343-6383

SPRINGFIELD, MISSOURI REGION ITS PLANNING DOCUMENT

Description:

The objective of this project is the development of a comprehensive Springfield Region ITS Planning Document. Though the rural ITS effort will embrace the traffic challenges in the entire region, the emphasis of this planning document will be to address the challenges in the Springfield urban area. Being the regional focal point for services for this region, the Springfield urban area experiences a heavy influx of traffic from rapidly growing surrounding communities. This document will contain the following elements:

- The identification of current ITS initiatives in the region;

- The identification of transportation stakeholders' needs through local focus group workshops - Transit, Emergency Services (Police, Fire and Ambulance), Commercial Vehicle Operations, Major Event Facilities (University/Colleges, Fairground, Bass Pro, etc.) and Intermodal Activities (Rail - Freight - Airport);

- The development of a Planning Guide that bridges current ITS activities (legacy system) to a future regional system that follows the National ITS Architecture and standards and meets regional transportation needs; and

- The identification of benefits that will support local, state and federal funding appropriations to enhance the regional transportation system.

The phase of this project funded by the earmark was completed on 6/30/2000. Remaining phases are in progress with other funding.

Project Location: Springfield, Missouri

Partner(s): Missouri DOT, City of Springfield

Start Date: September 1999

***End Date*:** January 2003

Estimated Total ITS Funds: $45,735

Estimated Total Project Cost: $150,000

***Contacts*:**

Bob Thomas	FHWA Missouri Division, HDA-MO	(573) 636-7104
Matt Seiler	Missouri DOT	(417) 895-7627

STATE OF VERMONT

Description:

The focus of this project will be on taking the first steps toward the development and deployment of this Integrated Information System. The system will act as the primary point of coordination for managing transportation resources, and will be responsible for the collection, fusion, analysis and dissemination of information on the status of the transportation system and travel conditions. The system will receive its information from a number of sources, including roadway weather information systems (RWIS), links to emergency management centers, and motorists' reporting of unusual events (e.g. accidents). The system will also aid in the delivery of information on any scheduled road construction work that may impact travel in this region. All this information will be fused and analyzed, and will then be disseminated to the public and other appropriate agencies through a number of en-route information dissemination devices. The first phase of this project should be regarded as an encompassing project that includes the following five elements:

- Providing for limited network surveillance capability, including the deployment of two Weigh-In-Motion (WIM) stations.
- Deploying Four Variable Message Signs (VMS) and Highway Advisory Radio (HAR).
- Deploying two Road Weather Information Systems (RWIS) sites.
- Improving the Incident Management Process.
- Gathering information for, and identifying key components of and shareholders in, the development of a future, small-scale transportation management and information center (TMIC).

Project Location: Rutland County, Vermont

Partner(s): FHWA; Vermont Agency of Transportation (VTrans); Vermont State Police; Vermont E-911 Board; Vermont Departments of Tourism and Marketing, and Buildings and General Services; Crossroads of Vermont Regional Marketing Organization, Rutland Regional Planning Commission, Tri-State Rural ATIS Partnership; Killington/Pico Resorts

Start Date: September 2001

***End Date*:** October 2006

Estimated Total ITS Funds: $396,807

Estimated Total Project Cost: $795,364

***Contacts*:**

Jim Bush	FHWA Vermont Division, HDA-VT	(802) 828-4423
Karen Songhurst	VTrans	(802) 828-1078

WASHINGTON, D.C. - PARTNERS IN MOTION (TRAVELER INFORMATION PROJECT)

Description: This project will implement a regional traveler information system which will become the source for a broad range of information about transportation conditions in the region. The brainchild of a coalition of public transportation agencies throughout the region, the Regional Traveler Information Project will offer the traveling public less wasted time and less travel-related stress than what they currently experience. It will also enable public transportation agencies to share information among themselves more effectively which, in turn, can help them better coordinate their operations.

Project Location: Washington, DC Metropolitan Area

Partner(s): Virginia DOT, Maryland SHA, District of Columbia DPW, Federal Highway Administration, Federal Transit Administration, Maryland Mass Transit Administration, Montgomery County DPW&T, Prince George's County DPW&T, Metropolitan Washington Airports Authority, Metropolitan Washington COG, Washington Metropolitan Area Transit Authority, Maryland-National Capital Park and Planning Commission, City of Alexandria DPW, City of Fairfax, Arlington County DPW, Dulles Area Transportation Association, Northern Virginia Transportation Commission, Fairfax County Office of Transportation, Potomac Rappahannock Transportation Commission, Loudon County Department of Planning, National Park Service, Tysons Transportation Association, Virginia Department of Rail & Public Transportation, Prince William County DPW&T, and Virginia Railway Express

Start Date: September 1996

***End Date*:** March 2003

Estimated Total ITS Funds: $7,800,000

Estimated Total Project Cost: $13,300,000

***Contacts*:**

Thomas Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
Jim Robinson	Virginia DOT - Richmond	(804) 786-6677

Integrated Systems - Corridors

ATLANTA SMART CORRIDOR

Description: This project is the FY 2002 ITS Integration Program earmark for Atlanta, GA. The project is the application of innovative and integrated technologies in a corridor setting. The Northwest Corridor in Atlanta and Cobb County is a congested arterial with limited available capacity for diversion on the parallel freeway - I-75. As of funding approval, the project is in the planning phase, and receiving recommendations from the corridor stakeholders. Anticipated applications include centralized traffic signal control and coordination, adaptive signal control strategies, transit (bus) priority systems, traveler information, incident management, and archived data management.

Project Location: Atlanta, Georgia

Partner(s): FHWA, Georgia DOT, Georgia Regional Transportation Authority; Cobb County Department of Transportation; Atlanta Regional Commission; Cities of Marietta, Smyrna, Atlanta

Start Date: September 2002

***End Date*:** September 2004

Estimated Total ITS Funds: $827,318

Estimated Total Project Cost: $3,139,318

***Contacts*:**

Mshadoni Smith	FHWA Georgia Division, HDA-GA	(404) 562-3638
John Leonard	State Road and Tollway Authority	(770) 486-8770

GREAT LAKES IMPLEMENTATION

Description:

This project combines FY 1999, 2000 and 2001 TEA-21 earmarks which have been titled Great Lakes Implementation and in FY 2001 was retitled Great Lakes Corridor, Wisconsin. The project is comprised of five components summarized as follows: (1) "MONITOR Upgrades" will develop, integrate and test the second generation of MONITOR software. MONITOR, Wisconsin's Freeway Traffic Operations System originating as part of the Gary-Chicago-Milwaukee priority corridor, is undergoing a comprehensive upgrade of freeway control, surveillance system and field devices. This upgrade will reconfigure MONITOR communication server components, modernize surveillance video management, and incorporate data exchanges with public safety and emergency service computer aided dispatch system in Southeastern Wisconsin. (2) "Wisconsin's Statewide Integrated Traffic Management System" will develop a comprehensive statewide traffic management system with an integrated communications network. The project will leverage traffic management software developed with funding from the FY 2000 earmark, and will satisfy user service requirements developed in a statewide and regional architecture. The system will connect all portable field devices and other deployed ITS equipment thus maximizing the effectiveness of remote control and coordination. System integration will be realized through employment of virtual traffic management centers comprised of desktop computers linked to servers in each WisDOT district. (3) "Rural Districts' Mini Weather Detection Systems" will deploy enhanced road weather information system (RWIS) stations configured with closed circuit TV cameras mounted on top enabling each station to project accurate visual images in identifying characteristics of precipitation. (4) "Statewide RWIS Extranet Site" will disseminate the RWIS network information statewide in a "one stop" clearinghouse via an Extranet website. (5) "Evaluations of Great Lakes Corridor Earmark Implementation Projects" will conduct an independent evaluation of the impacts of ITS deployments on the Great Lakes Corridor surface transportation system. The funding amounts depicted below include the sum of FY 1999, 2000 and 2001 earmarks and the total cost estimate includes matching funds for the three years.

Project Location: State of Wisconsin

Partner(s): Wisconsin DOT; Wisconsin Department of Motor Vehicles; Wisconsin State Patrol; Wisconsin Divisions of Business Management, Investment Management, Infrastructure Development

Start Date: September 1999

***End Date*:** December 2003

Estimated Total ITS Funds: $4,743,010

Estimated Total Project Cost: $9,490,142

***Contacts*:**

John Berg	FHWA Wisconsin Division, HDA-WI	(608) 829-7515
Phil DeCabooter	Wisconsin DOT	(608) 267-0452

NORTHEAST CORRIDOR

Description:

Subsequent to enactment of ISTEA in 1991, U.S. DOT designated the northeastern corridor bounded by Maine and Virginia as an ITS Priority Corridor. The I-95 Coalition was established to coordinate and facilitate activities to enhance mobility, safety and efficiency across all modes serving the region. The enactment of TEA-21 extended Federal support for I-95 Corridor activities under the auspices of the I-95 Coalition. As Intelligent Transportation Systems have evolved, the Coalition's projects have correspondingly changed their focus from earlier activities on field operational tests and research to facilitating deployment and integration within a regional context.

The I-95 Corridor Coalition's mission is to work collaboratively to improve transportation services and operations in the Mid-Atlantic and Northeast regions of the U.S. through the coordinated implementation and integration of advanced technology. The Coalition's vision is that the transportation network in these regions will be safe, seamless, intermodal, and will support economic growth in an environmentally responsible manner. To accomplish the mission, the Coalition invests in and provides technical support to projects that involve multiple member agencies and lead to follow-on projects. Six Program Tracks provide the structure through which the Coalition's strategies are accomplished. Each track focuses on a functional or support category of activity the Coalition intends to pursue in the ensuing five-year period. The Program Tracks are: Program Management; Inter-Regional Multimodal Traveler Information; Coordinated Incident Management; Commercial Vehicle Operations; Intermodal Transfer of People and Goods; and Electronic Payment Services. In reviewing the examples of Coalition initiatives which follow, it is to be noted that some of the projects are TEA-21 Deployment Program initiatives described in other sections of this document. Highlights of the I-95 Coalition's projects include:

THE COALITION'S COORDINATED INCIDENT MANAGEMENT PROGRAMS - This initiative is one of the earliest examples of interagency regional coordination and cooperation in the nation. Response to major incidents, construction and events is being facilitated through on-going planning and information meetings at the regional and sub-regional levels.

THE NORTHEAST ADVANCED TRAVELER INFORMATION SYSTEM - This is a cooperative project involving Maine, New Hampshire and Vermont. These states are jointly developing and deploying a tourism-oriented rural traveler information system under Coalition sponsorship.

TRAVEL SHENANDOAH - The Coalition is supporting the exploration of extending this rural traveler information system currently deployed along I-81 in Virginia to Maryland, Pennsylvania, and ultimately potentially to New York.

BALTIMORE METROPOLITAN COUNCIL ADVANCED TRAVELER INFORMATION SYSTEM - The Coalition is supporting the development and planning for this advanced traveler information system (ATIS) deployment which will be integrated with the Maryland State Highway Administration's CHART II Transportation Management System. This deployment will fill an ATIS gap in the corridor between Washington, D.C. and Philadelphia.

PORT ACCESS OPERATIONAL TEST - This field operational test evaluates the use of the

Internet and ITS technologies to provide information on ship arrival and departure schedules, container/cargo availability to terminal operators, and drayage dispatchers at the Ports of New York and New Jersey. This system also provides real-time traffic information on regional and local traffic conditions, and video of points of terminal entry and major on-port access roads.

OVERSIZE/OVERWEIGHT PERMITTING - The Coalition is advancing ongoing efforts of the Northeast oversize/overweight (OS/OW) permitting agencies to explore the concept of regional OS/OW permitting. The Coalition has funded a project examining other regional permitting models in the U.S. to identify technical and institutional challenges to implementation.

These initiatives are complemented by activities directed at benefiting travelers and member agency staff. A sample of these activities includes:

TRAVELER ALERT MAP - Distributed twice a year to the traveling public and commercial transportation companies at rest areas, welcome centers and public affairs offices.

A proposed INTERMODAL TRAVELER INFORMATION SYSTEM which will provide corridor-wide origin-to-destination information on modal options, routes, travel times, and costs to intercity travelers.

THE INTEGRATED SYSTEM FOR CORRIDOR OPERATIONS AND MANAGEMENT - This will be a GIS-based, Web-accessible management tool designed to provide information on corridor-scale traveler patterns and travel times.

THE NORTHEAST CORRIDOR TRANSPORTATION INFORMATION NETWORK expands on the Information Exchange Network activated in 1994. This wide area network connects transportation management centers throughout the region. Information on major incidents and events entered into the system is instantaneously shared with other corridor centers.

ELECTRONIC PAYMENT SYSTEM FRAMEWORK - The goal of phase I of this project is to develop an architecture and deployment model encompassing all types of electronic payment activity (tags, readers, smart cards) and modes of transportation. Phase II will conduct an operational test of the architecture and deployment design.

ARCHITECTURE AND STANDARDS SUPPORT AND TESTING - The Coalition has been supporting the advancement and application of emerging ITS standards through participation in several activities:

- The use of emerging NTCIP protocols to communicate with dynamic message signs manufactured by different vendors and controlled by a single software system.
- Sponsorship of workshops addressing NTCIP DMS specifications.
- Support of the Port Authority of New York and New Jersey in identifying NTCIP-based core functions to be used in a DMS purchase specification.
- Current planning anticipates activities to test specific ITS standards and participation in

Information Exchange Forums addressing the implementation of FHWA's Final Rule on Intelligent Transportation System Architecture and Standards.

Federal funding amounts depicted below represent appropriations since the enactment of TEA-21 through FY 2001. Total amounts include matching funds.

Project Location: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and Virginia

Partner(s): Coalition Members: The Departments of Transportation in Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, New York City, Pennsylvania, Rhode Island, Vermont, and Virginia. Also members are the Delaware River & Bay Authority, Delaware River Port Authority, Delaware Turnpike Administration, Maine Turnpike Authority, Maryland Transportation Authority, Massachusetts Turnpike Authority, New York State Thruway, New York Metropolitan Transportation Authority, New Jersey Highway Authority, New Jersey Turnpike Authority, Pennsylvania Turnpike Commission, Port Authority of New York & New Jersey, South Jersey Transportation Authority, and Triborough Bridge & Tunnel Authority. In addition, other agencies in the transportation community in the Northeast participate as affiliate members.

Start Date: September 1998

***End Date*:** Ongoing

Estimated Total ITS Funds: $16,312,000

Estimated Total Project Cost: $32,624,000

***Contacts*:**

Chung Eng	FHWA Headquarters, HOTM	(202) 366-8043

SOUTHEAST CORRIDOR TRANSPORTATION EXPANSION (T-REX) PROJECT

Description:

This project is the FY 2002 ITS Integration Program earmark for the Metropolitan ITS Integration Program earmark for the Metropolitan Denver, Colorado area. The project is centered on major infrastructure improvement along the I-25 and I-225 Corridors in the Denver Metropolitan area designated Transportation Expansion or T-Rex.

One component of this multi-faceted effort is the T-Rex Transit ITS Integration Project which will integrate light rail, bus, Park-N-Ride facilities, and highway components to provide real-time traveler information and improved transit operations. Major features include:

- Deployment of Transit Information Displays which integrate light rail transit and bus real-time vehicle location information into a single database which feeds dynamic message signs and public address systems to display/announce arrival times and other transportation to both bus and light rail patrons at Park-N-Ride lots and light rail stations.

- Deployment of transit signal priority at signalized intersections around Park-N-Ride lots and light rail transit stations.

- Integration of parking management system operations in the corridor to inform motorists arriving at Park-N-Ride lots of space availability through dynamic message signs and other real-time delivery devices.

Project Location: Metropolitan Denver, Colorado

Partner(s): FHWA; FTA; Colorado DOT; Regional Transportation District (RTD); Counties of Arapahoe, Denver, Douglas; Cities of Aurora, Denver, Greenwood Village

Start Date: September 2002

***End Date*:** September 2006

Estimated Total ITS Funds: $5,791,228

Estimated Total Project Cost: $11,582,456

***Contacts*:**

Scott Sands	FHWA Colorado Division, HDA-CO	(303) 969-6730	Ext. x362
Gary Gonzales	Transportation Expansion (T-REX) Project	(303) 357-8575	

Integrated Systems - Statewide/Regional Integration Programs

DELAWARE STATEWIDE DELTRAC INTEGRATION

Description:

This project is the FY 2001 ITS Integration Program earmark for the State of Delaware. The project continues implementation of the Delaware Integrated Transportation Management Strategic Plan initiated in 1997. Building on previous deployment and integration activities including electronic detection systems and Police/Fire computer-aided dispatch, the current phase undertakes three sub-systems described below.

The DelTrac Information Exchange System will provide a multi-platform base to capture information from the control and monitoring systems, and provide that information in multiple formats to a variety of devices. Information will be posted on the Department Web Site, variable message signs, kiosks and PDAs.

The Incident and Event Management System will provide a mechanism to provide guidance to Travel Management Center (TMC) operators during incidents and accidents, log incidents, display incidents on the DelTrac GIS system, and consolidate management of records. This system will integrate and exchange information with the Police/Fire Computer-aided Dispatch System, the #77 Cellular Reporting System, and will accept direct operator input.

The GIS Update and Annotation System will provide a system level data and mapping update program that will enable TMC operators to update GIS database and mapping information for control and monitoring displays at the TMC.

The FY 2002 ITS Integration Program earmark for Delaware added $1,654,637 to this project. This funding allocation is reflected in the "Estimated ITS Costs" and "Estimated Total Costs" figures depicted below. Added funding will support continuity of projects initiated with previous earmarked funding, and provide for Transportation Management Center (TMC) Technical and Implementation Support in conjunction with activation of the new TMC. FY 2002 funding will also support the planning, design and engineering for the Incident and Event Management System and the Information Exchange System.

Project Location: State of Delaware

Partner(s): FHWA, Delaware DOT

Start Date: September 2001

End Date: November 2004

Estimated Total ITS Funds: $2,448,252

Estimated Total Project Cost: $4,899,552

Contacts:

Patrick Kennedy	FHWA Delaware Division, HDA-DE	(302) 734-5326
Gene Donaldson	Delaware DOT	(302) 760-2133

DELAWARE STATEWIDE ITMS INTEGRATION

Description:

This project constitutes the FY 2000 Integration Program earmark for the State of Delaware. Delaware DOT has undertaken installation of the Integrated Transportation Management System (ITMS); a technology-based approach to integrating and improving highway, transit and emergency operations. The DEL DOT ITMS Integration Project will focus on integrating existing traffic signals, video monitoring sites, and detection sites statewide into one centrally controlled network.

The urbanized areas of the project include New Castle County (Wilmington) and the City of Dover. The remainder of the project will take place in a rural setting. In both the rural and metropolitan areas, the majority of the ITMS equipment to be integrated either currently exists, or will have been deployed by other projects prior to the start of this project. Where required, legacy controllers will be upgraded to allow integration into the new statewide system. This project will tie these systems into the statewide IP-based communications network, and connect them to the ITMS central control system and operations software. The project focus will be on integrating Traffic Signals, Video Monitoring Cameras, and Transportation Monitoring Sites into the ITMS. Separate and parallel efforts will integrate transit and emergency management operations into the system. In the fall of 2002, Delaware DOT opened a new Transportation Management Center to be colocated with the Delaware Emergency Management Center. When ITMS is completed, it will exercise real-time control and monitoring along a major segment of Delaware's so-called "Critical 250 miles" of highway network.

Project Location: Delaware Statewide

Partner(s): FHWA, FTA, Delaware DOT, Delaware Transit Corporation

Start Date: July 2000

***End Date*:** June 2003

Estimated Total ITS Funds: $1,572,842

Estimated Total Project Cost: $3,145,684

***Contacts*:**

Patrick Kennedy	FHWA Delaware Division, HDA-DE	(302) 734-5326
Gene Donaldson	Delaware DOT	(302)760-2303

MINNESOTA GUIDESTAR PROGRAM PRE FY 1999

Description:

Minnesota Guidestar provides overall direction to the Minnesota Department of Transportation's ITS 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 ITS. During the period authorized by ISTEA, some projects were defined at the national level; these projects are documented in individual project descriptions appearing in the "Completed Projects" sections of appropriate chapters. Projects defined and initiated at the Guidestar level are described in fiscal year increments beginning in FY 1999, and when completed are annotated with end dates, but not relocated to a "Completed Projects" section of this document. The Minnesota Guidestar Program manages ITS projects statewide as well as an extensive research program in collaboration with the University of Minnesota's Center for Transportation Studies, Intelligent Transportation Systems Institute. Projects described in this increment include those initiated prior to FY 1999.

INTEGRATED CORRIDOR TRAFFIC MANAGEMENT (ICTM) - This project evaluated 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. Installation of the first phase equipment started in 1995, with subsequent phases of work initiated in early 1996. Full operation of the test started in 1997 and was completed in April 2000.

POLARIS - The Polaris project produced a statewide ITS architecture defining an integrated system of ITS technologies for providing user services in Minnesota. The project began in July 1995, and was completed in December 1996.

DURING INCIDENTS VEHICLES EXIT TO REDUCE TRAVEL TIME (DIVERT) - This project provided traffic guidance and control during freeway incidents, by managing traffic through coordinated signal timing plans along designated streets in downtown St. Paul. The diverted traffic added to the streets is accommodated in a planned fashion, as opposed to traffic randomly entering downtown St. Paul. The test phase of the project began in January 1995, and was completed in September 1998.

PORTABLE TRAFFIC MANAGEMENT SYSTEMS (PTMS) - This project used a portable electronic traffic management system including changeable message signs, CCTV, portable signal systems, cellular and spread-spectrum radio communications, and a lap-top commuter monitor and control system to manage traffic associated with several sporting events and the Minnesota State Fair. The PTMS has resulted in a package of devices which can be deployed in fairly short notice to manage traffic where no existing surveillance and control systems. The evaluation report was completed in October 1995.

ADAPTIVE URBAN SIGNAL CONTROL AND INTEGRATION (AUSCI) - The objective of this project was to implement an adaptive signal control algorithm for the existing traffic control system in Minneapolis, and also integrate with the existing ramp metering systems along I-394 and I-94. Completed in October 2000.

SMARTDARTS - The SmartDARTS Project measured the benefits of a combination of advanced technologies within a paratransit environment. Objectives of the project included: improved responsiveness; increased capacity; and increased cost effectiveness. The test portion of the project began in July 1995, and was completed in October 1998.

IN-VEHICLE SIGNING SYSTEM FOR SCHOOL BUSES AT RAIL-HIGHWAY CROSSINGS - This project will bring together key parties to develop the infrastructure, system electronics and in-vehicle units for the first in-vehicle signing system. This will serve to increase safety by: removing uncertainty about driving conditions; assessing the driver in the decision making process; and easing the overall driving task in general. The project was completed in May 1997.

MAYDAY PLUS - This project demonstrated significant, measured reductions in the times taken to reach victims of rural motor vehicle accidents through enriching the information made available to emergency service providers, thereby reducing response times, improving safety and saving lives. The 18-month test phase of the project began in January 1996.

ST. PAUL ADVANCED PARKING INFORMATION SYSTEM - The Advanced Parking Information System is designed to provide motorists with real-time information regarding the status of parking facilities plus directions for the best routes to open parking facilities using automated variable message signs and static signs. Testing of the system began in January 1996, and the project evaluation was completed in September 1998.

DULUTH TRANSPORTATION OPERATIONS CENTER - The purpose of the Duluth Transportation Operations Center is to cooperatively enhance traffic management and traveler information capabilities in order to increase the safety and efficiency of the transportation system in the Duluth area. The geography of the Duluth area presents unique challenges to the motorist, rapidly changing weather conditions, rugged terrain, limited alternate routes and peak tourist volumes often times make travel difficult. There is a need to furnish motorists with timely information as to road/weather conditions, events, alternate routes, provide swift incident response and have a central location for information on all modes of transportation. The goals of the Duluth Transportation Operations Center are to develop an expandable traffic management system, deploy a real-time traveler/weather information system, establish a framework for interagency cooperation for incident response and operation/maintenance of traveler information systems and to integrate transit operations into a Traffic Management System.

ST. CLOUD TRANSPORTATION OPERATIONS CENTER - This project improved the signal operations and maintenance in the St. Cloud metro area by reviewing the existing practices of the city, county, and state then implementing actions to address these issues. Examples of issues which were addressed are: signal coordination, signal repair, monitoring of signals, jurisdictional boundaries, etc. It also provides travel information to the public via real-time messages on site and other means that are to be established. Seasonal congested areas, construction information, and winter weather closures on I-94 are some areas that are being reviewed for information needs.

SOUTHWEST AND WEST-CENTRAL MINNESOTA TRANSIT LINK PROJECT - The need to access regional centers is a crucial link to maintain the region's population and economic vitality. The three public transit systems of Prairie Five Rides, Rainbow Rider and WESCAP Heartland Express provide public service to a combined total of fourteen rural counties. These three transit programs have been working together to expand access to common regional centers and coordinate services for the best service level at the lowest operational costs. This endeavor requires a high-level of fast, reliable and simple communication between each system and common local data management practices and parallel data operating systems.

ROCHESTER TRANSPORTATION OPERATIONS CENTER - The focus of this project is to improve safety and relieve congestion along the Highway 14/52 corridor in Rochester. One component of this project includes a six-month study which will be used to develop a comprehensive and detailed concept plan for ITS in the Highway 14/52 corridor.

MANKATO TRANSPORTATION OPERATIONS CENTER - The project combines real-time traveler information and data collection with traffic management and operational features. The three primary goals of this project are to provide positive traffic control on Interstate 90 from Albert Lea to the South Dakota State Line during adverse weather conditions, manage the traffic signal systems in the Mankato area as well as provide traveler information for special events/incidents, and provide real-time traveler and operational information for the public transit systems in the District 7 area.

MOORHEAD AREA INTEGRATED TRAIN DETECTION AND TRAFFIC CONTROL SYSTEM - The purpose of the Moorhead Area Integrated Train Detection and Traffic Control System Project is to develop an integrated system for detection of trains so that special timing plans can be selected when trains are approaching and when trains are present. It will also provide travelers and dispatchers with information on train movements. This system is needed in Moorhead because an average of 70 trains per day pass through the City of Moorhead on tracks that cross many local and arterial streets at-grade. The average passage time is four minutes at each intersection for a total of about 4 hours and 40 minutes per day. The current traffic signal system has only some intersections with localized railroad preemption.

IVI SNOWPLOW DEMONSTRATION PROJECTS - Minnesota's heavy snow, blowing snow, and ice impact travel. These impacts include crashes, stalls and stranded travelers, abandoned vehicles, travel delays and increased time for emergency vehicles to respond to incidents or to transport sick or injured persons. The societal costs, including deaths, injuries, property damage, lost productivity, etc., of these impacts are significant.

STATEWIDE ADVANCED TRAVELER INFORMATION SYSTEMS SUPPORT - The purpose of the Statewide Advanced Traveler Information Systems (ATIS) Support Project is to develop an overall strategy and design for the creation of a statewide advanced traveler information system. This will incorporate the individual ATIS efforts throughout the state into a cohesive system where they will cooperatively enhance the traveler information capabilities throughout the state. There is a need to furnish motorists with timely information as to road/weather conditions, events, alternate routes, provide swift incident response and have a central location for information on all modes of transportation.

COMMERCIAL VEHICLE INFORMATION SYSTEMS AND NETWORKS (CVISN) - The Minnesota CVISN pilot project was one of seven CVISN pilot project states to be selected as prototype states. The CVISN Model Deployment Program will focus on increased safety and efficiency through electronic integration of CVO information systems. The CVISN project will enhance Minnesota's information systems by creating open electronic data interchange standards and interfaces for all CVISN systems. It will provide safety information distribution at the roadside, electronic application for credentials, electronic clearinghouses for the payment of the registration tax and fuel tax, along with the electronic clearance of trucks at fixed and mobile enforcement sites.

UNIVERSITY OF MINNESOTA ITS RESEARCH PROJECTS - Various research projects will be conducted at the University of Minnesota under the auspices of Guidestar. The research areas which may be pursued based on a selection process include: Traveler Services; Traffic Management; Maintenance Operations; Vehicle Technologies; Safety and Human Factors; Modal and Rural Issues; Infrastructure Systems; Societal and Environmental Issues.

Project Location: Statewide throughout Minnesota

Partner(s): Minnesota DOT is lead and other partners include Federal, State and local agencies and private companies interested in the evaluation and deployment of ITS user services and technologies. Principal State agencies include University of Minnesota, Minnesota State University, Department of Public Safety and the Minnesota State Highway Patrol.

Start Date: January 1991

***End Date*:** Ongoing

Estimated Total ITS Funds: $39,203,947

Estimated Total Project Cost: $93,054,750

Contacts:

James McCarthy	FHWA Minnesota Division, HPO-MN	(651) 291-6112
Linda Taylor	ICTM: Minnesota DOT	(651) 582-1461
Ray Starr	Polaris: Minnesota DOT	(651) 582-1439
Ben Osemenam	DIVERT & In-Vehicle Signing: Minnesota DOT	(651) 297-5651
Marthand Nookala	PTMS & Advanced Parking: Minnesota DOT	(651) 296-1615
Marilyn Remer	AUSCI: Minnesota DOT	(651) 582-1601
Sara Lenz	SmartDARTS: Minnesota Office of Transit	(651) 296-3441
Ginny Cronson	Mayday Plus: Minnesota DOT	(651) 296-4935

MINNESOTA GUIDESTAR PROGRAM - FY 1999

Description:

This section describes the FY 1999 ITS Integration Program developed by Minnesota Guidestar. Minnesota's statewide, integrated ITS program is a multi-year activity guided by a Board of Directors providing strategic direction and oversight of ITS research, field operational tests, deployment support, deployment and integration projects throughout the state. In some cases, projects described are continuations of TEA-21 Deployment Program initiatives begun in earlier years.

ROCHESTER TRANSPORTATION OPERATIONS CENTER - The focus of this project is to improve safety and relieve congestion along the Highway 14/52 corridor in Rochester. One component of this project includes a six-month study which will be used to develop a comprehensive and detailed concept plan for ITS in the Highway 14/52 corridor. The concept plan will include an early deployment plan which will be designed and constructed in the next two and a half years. Some of the features of the early deployment plan could be variable message signs, a closed circuit television system, traffic management systems, and road weather and traveler information kiosks. This project will not only address safety and congestion concerns well into the future, it will also serve as part of the traffic control during the Highway 14/52 construction.

MANKATO TRANSPORTATION OPERATIONS CENTER - The project combines real-time traveler information and data collection with traffic management and operational features. The three primary goals of this project are to provide positive traffic control on Interstate 90 from Albert Lea to the South Dakota State Line during adverse weather conditions, manage the traffic signal systems in the Mankato area as well as provide traveler information for special events/incidents, and provide real-time traveler and operational information for the public transit systems. The I-90 road closure system is designed to improve safety and efficiency of I-90 between I-35 and South Dakota. By closing the roadway at the optimal time, fewer accidents and vehicle stalls will occur and snowplowing can occur with fewer delays to tend to stalls, abandoned vehicles and stranded travelers. All of these facts allow the road to be reopened to travel more quickly and restored to a better pavement surface condition because there has been less compaction of snow. Travelers benefit because they have been able to wait at locations with adequate facilities. The system has been coordinated with the South Dakota gate closure system to assure a relatively uniform presentation to travelers in both states.

MOORHEAD AREA INTEGRATED TRAIN DETECTION AND TRAFFIC CONTROL SYSTEM - The purpose of the Moorhead Area Integrated Train Detection and Traffic Control System Project is to develop an integrated system for detection of trains so that special timing plans can be selected when trains are approaching and when trains are present. It will also provide travelers and dispatchers with information on train movements. This system is needed in Moorhead because an average of 70 trains per day pass through the City of Moorhead on tracks that cross many local and arterial streets at-grade. The average passage time is four minutes at each intersection for a total of about 4 hours and 40 minutes per day. The current traffic signal system has only some intersections with localized railroad preemption. This project will address the following problem conditions: Safety concerns at high volume at-grade railroad crossings; Increased emergency vehicle response time when trains are present; Interruption of transit operations when trains are present; and Extensive vehicular delays when trains are present.

IVI SNOWPLOW DEMONSTRATION PROJECTS - Minnesota's heavy snow, blowing snow, and ice impact travel. These impacts include crashes, stalls and stranded travelers,

abandoned vehicles, travel delays and increased time for emergency vehicles to respond to incidents or to transport sick or injured persons. The societal costs, including deaths, injuries, property damage, lost productivity, etc., of these impacts are significant. Minnesota undertook an Intelligent Vehicle Initiative - Specialty Vehicle (Snowplow) Case Study to determine potential benefits of using technology packages which assist snow plow operators to "see" the road boundaries and/or lane lines and obstacles (such as other vehicles, roadside appurtenances and large snow drifts) in extreme low visibility conditions. The Case Study describes how these packages will increase snowplow operator productivity and confidence during the worst conditions and therefore reduce crashes, incidents, delays, etc. This is done by the use of sensors that detect the road surface and stalled vehicles, slow-moving vehicles, and persons walking on the road. The Case Study assesses the potential safety and operational benefits of various levels of penetration of these market packages. It defines two demonstration or operational tests of some set of technology packages in maintenance vehicles, a commercial vehicle fleet or both.

STATEWIDE ADVANCED TRAVELER INFORMATION SYSTEMS SUPPORT - The purpose of the Statewide Advanced Traveler Information Systems (ATIS) Support Project is to develop an overall strategy and design for the creation of a statewide advanced traveler information system. This will incorporate the individual ATIS efforts throughout the state into a cohesive system where they will cooperatively enhance the traveler information capabilities throughout the state. There is a need to furnish motorists with timely information as to road/weather conditions, events, alternate routes, provide swift incident response and have a central location for information on all modes of transportation. The goals of the Statewide ATIS are the following: to make travel safer through the State of Minnesota; to make travel in Minnesota more efficient; and to increase the user satisfaction for those persons traveling in Minnesota. The Statewide ATIS will include such components as Road Surface Conditions; Weather and Visibility Conditions; Construction and Maintenance Delays; Incident Delays; Tourism Information; Weight Restrictions; and Road Closures/Openings.

UNIVERSITY OF MINNESOTA ITS RESEARCH PROJECTS - Various research projects will be conducted at the University of Minnesota. Identification and selection of the research projects has resulted in the need to address the following areas: Traveler Services; Traffic Management; Maintenance Operations; Vehicle Technologies; Safety and Human Factors; Modal and Rural Issues; Infrastructure Systems; and Societal and Environmental Issues.

HIGHWAY/RAILROAD INTERSECTION OPERATIONAL TEST - This project will provide two separate tests of technology to build upon the successfully In-Vehicle Signing operational test. The first test will be to develop and operationally test, including a human factors evaluation, a prototype low cost active warning system designed to be used at low volume Highway/Railroad Intersections (HRIs). This test will provide active warning at a crossing currently only containing passive warning devices. The concept includes red flashing LEDs on the standard cross buck sign, and amber flashing LEDs on the advanced warning system. The system would be powered by a solar cell with 12-volt battery backup. Train detection would be by means of a Head-of-Train (HOT) signal detector. The system would have a flicker or other pattern when it is not performing properly, but otherwise would operate the same as an existing active warning system with only flashing lights. The second test will include an updated in-vehicle sign for use in additional school buses and other vehicles required to stop at HRIs. Train detection would either be built into the in-vehicle device or detected at the crossing via broadcast to approaching vehicles. The goal of this HRI project is safety, primarily focused at low volume HRI where traditional warning systems cannot be cost effectively deployed. Both of the HRI efforts will demonstrate and test technologies, information flows, and data flows that are not fully developed in the National ITS architecture and standards at this time. These projects will continue to lead

the way in the field of roadside-to-vehicle communications for HRI.

RURAL ITS CORRIDOR ITS TECHNOLOGY DEMONSTRATION CORRIDOR - There is a need to test ITS technologies that will improve safety and efficiency of travel on two-lane highways outside of urban areas. About 70% of all fatal crashes occur on two-lane roads passing through countrysides or small towns under 5,000 population. The traditional solution to safety and capacity problems on these roads is to add more lanes, close access openings, build frontage roads, etc. These solutions are becoming less and less viable due to limited construction resources and the need to preserve the natural environment. This project will seek to identify and test ITS market packages individually or as a group that can be used to address the safety and capacity on two-lane rural roads. To date informal conversations have occurring between MNDOT and several potential public and private partners that are interested in pursuing this goal with MNDOT. No specific partner, technology, ITS market package or architecture has been selected for this project as of this time.

Project Location: Statewide throughout Minnesota

Partner(s): Minnesota DOT is lead and other partners include Federal, State and local agencies and private companies interested in the evaluation and deployment of ITS user services and technologies. Principal State agencies include University of Minnesota, Minnesota State University, Department of Public Safety and the Minnesota State Highway Patrol.

Start Date: September 1999

***End Date*:** Ongoing

Estimated Total ITS Funds: $3,699,000

Estimated Total Project Cost: $10,038,000

***Contacts*:**

James McCarthy	FHWA Minnesota Division, HPO-MN	(651) 291-6112

MINNESOTA GUIDESTAR PROGRAM - FY 2000

Description:

This section describes the FY 2000 ITS Integration Program developed by Minnesota Guidestar. Minnesota's statewide, integrated ITS program is a multi-year activity guided by a Board of Directors providing strategic direction and oversight of ITS research, field operational tests, deployment support, deployment and integration projects throughout the state. In some cases, projects described are continuations of TEA-21 Deployment Program initiatives begun in earlier years.

TOCC INTEGRATION AND DEPLOYMENT - PHASE I. MN DOT and the Minnesota State Patrol have initiated a program to create nine colocated and shared Transportation Operations Communications Centers (TOCCs) throughout rural Minnesota. This program will, over a six-year period, bring together the resources of both agencies in order to provide comprehensive communications services. The TOCCs will be staffed by the State Patrol and supported by MNDOT on 7 day/week, 24-hour/day basis. The principal function of the TOCC is to control and coordinate communications related to travel on the State highway system. Statewide deployment will ensure consistency and interoperability of communications centers; provide standardization of systems, facilities and practices; and result in more efficient use of resources. ITS Funding: $1,250,000; Total Funding: $2,500,000

TH 51 MULTI-JURISDICTIONAL SIGNAL INTEGRATION - STAGE I. This deployment/integration project will deploy a multi-jurisdictional adaptively-controlled integrated signal system along a high volume trunk highway. When implemented, the system will allow safe operating agencies to manage traffic; incidents and traveler information along the corridor. ITS Funding: $150,000; Total Funding: $300,000

ITS INTEGRATION/OPERATIONS AND MAINTENANCE PLAN AND ARTERIAL COMMUNICATIONS PLAN FOR TWIN CITIES. The ITS Operations and Maintenance (O&M) and Arterial Communications Plan will examine the operations and maintenance strategies for several levels of government. It is a three-stage effort with products documenting the activities in each stage. The stage one product will be a report summarizing regional viewpoints, support requirements, and concerns. The stage two product will be a published plan that provides a framework for agencies to follow in pursuit of regional operations and maintenance. The stage three product will be a Regional Arterial Communications Plan which identifies the data flows necessary at specific geographic locations to support the regional operations and maintenance plan and the planned infrastructure. ITS Funding: $25,000; Total Funding: $50,000

AUSCI EXPANSION TO TH 55 - PHASE I. The purpose of this Deployment/Integration project is to reduce the anticipated degradation in peak traffic flows along a high volume arterial (Hiawatha Ave.) that will be caused by the introduction of light rail vehicle operation adjacent to the corridor. Metro Transit, the operating agency for the metropolitan bus transit system and future operator of the light rail system, will procure and install an Automatic Vehicle Location/Global Positioning System (AVL/GPS) on buses operating in the metropolitan area. AVL/GPS equipment will be added to the 26 light rail vehicles to be used in the Corridor. ITS Funding: $150,000; Total Funding: $300,000

I-90 REMOTELY ACTUATED GATE CLOSURE SYSTEM-PHASE I. This Operational Test will develop and test technology and communication for remote closure and opening of advanced traffic management remotely actuated Gate Closure System to be deployed on I-90 between I-35 and South Dakota. I-90 crosses the southern region of Minnesota on an east-west axis stretching from Wisconsin to South Dakota. Under blizzard conditions, the interstate must be closed to ensure motorist safety. Remote actuation of gates at ramps and other strategic locations will reduce personnel requirements for gate operation, ensure uniform enforcement of interstate closures, reduce motorist risk, and improve snow removal operations. ITS Funding: $125,000; Total Funding: $250,000

ITS ARCHITECTURE AND STANDARDS MIGRATION PLAN. The activities to be conducted in this project will develop and define an approach for migrating Minnesota's ITS deployments toward large scale implementation of ITS Standards. The end product will include a plan or identifying/selecting standards for metropolitan and rural ITS infrastructure deployments. Upon completion of the migration and integration plan, the focus of effort and funding will be directed to execute high priority, near-term activities needed to implement the most promising candidate standards. The specific standards and associated equipment will be defined in the plan. ITS Funding: $325,000; Total Funding: $650,000

ITS ARCHITECTURE, STANDARDS AND INTEGRATION SUPPORT. The purpose of the project is to realign the documentation of the Minnesota ITS Architecture to achieve consistency with the National ITS Architecture. The existing statewide architecture (the Polaris architecture) was developed during the period in which the National ITS Architecture was under development. This project will bring the existing architecture documentation into conformance with the National ITS Architecture and provide continuing support to maintain Polaris, to include new ITS programs. ITS Funding: $250,000; Total Funding: $500,000

SYSTEMS INTEGRATION FOR SMART DARTS, PHASE III. The project will complete the installation of mobile display terminals, automatic vehicle location devices and system integration with currently installed computer-assisted dispatch and scheduling system. Upon completion, DARTS will have improved capability to share scheduling and dispatching information with other transit and paratransit organizations in the Twin Cities. ITS Funding: $100,000; Total Funding: $200,000

EXPANDED APPLICATION OF COMPUTER ASSISTED DISPATCHING TO RURAL TRANSIT SYSTEMS. This project is designed to improve existing conditions identified in the precursor scoping study. The scoping study determined that there are limited communications links among transit agencies. Constrained information sharing capabilities preclude transit riders from coordinating cross-boundary trips with other providers. Finally, there is no rapid reliable method for communicating trip changes to dispatched vehicles. The goal of the Computer-Aided Dispatch (CAD) for Rural Transit is to deploy a standardized computer-aided trip management and dispatching system. The new system will be used by transit agencies throughout the State. While continuing to operate independently, the various transit agencies will provide access to each other's systems in order to facilitate trip reservations and scheduling involving two or more providers for a single trip. ITS Funding: $250,000; Total Funding: $500,000

ADDITION OF ADVANCED VEHICLE LOCATING SYSTEMS TO TRANSIT SYSTEMS PARTNERING IN SOUTHWEST TRANSLINK. The Transit Link vehicle fleet represents a significant investment in providing transit services to southwest rural Minnesota. The purpose of this project is to expand the capabilities of the transit systems by providing real-time information to transit vehicle drivers. The integration of wireless radio, coupled with GPS-based AVL system and an integrated CAD will provide the communication, mapping and tracking elements to complete an advanced scheduling system. This system is visualized as providing valuable data to aid drivers, supervisors, and foremen. ITS Funding: $100,000; Total Funding: $200,000

EXPANSION OF IVI-LATERAL GUIDANCE AND WARNING SYSTEMS. This operational test is a component of the FY 2000 State of Minnesota earmark. Minnesota DOT, in cooperation with FHWA, the Intelligent Vehicle Initiative (IVI) Task Force of ITS America, and the IVI Specialty Vehicle Pooled Fund steering committee is conducting research and testing on vehicle-to-infrastructure communications to reduce crashes. Minnesota DOT's research and operational tests focus on the interaction of lateral guidance and obstacle detection with warning systems. This project will provide the additional infrastructure (such as magnetic tape and/or transmitters) along Trunk Highways 19 and 7 to ensure the results of these projects are based on adequate data collection and analysis. ITS Funding: $250,000; Total Funding: $500,000

IVI INTERREGIONAL CORRIDOR ITS PLAN. In 1998 MNDOT initiated the Interregional Corridor (IRC) Study to assess mobility between regional trade centers across the State. This IRC Study identified specific interregional and regional corridors that fall below target mobility levels currently and in future projections. The IRC corridors will be examined for possible ITS-based applications that can improve safety and mobility in these areas. The general approach used is to hold focus groups to set priorities for potential ITS demonstration projects capable of addressing safety and mobility. This is followed by detailed planning for, and implementation of ITS Technology Demonstration Projects. ITS Funding: $100,000; Total Funding: $200,000

DESIGN, PROCURE, INSTALL AND ACTIVATE MOBILE DATA COMPUTERS IN MAINTENANCE VEHICLES. This project will design, procure, install and activate Mobile Data Terminals (MDT) in maintenance vehicles. When fully deployed, the MDT system will provide MDT coverage for each of Minnesota's nine rural TOCCs throughout the State and the Regional Transportation Management Center (RTMC) in the Twin Cities Metro Area. The system will enable automatic incorporation of real-time data such as snowplow sand and salt spreader status into TOCC databases. ITS Funding: $875,000; Total Funding: $1,750,000

CONTINUATION AND EXPANSION OF COMPUTER ASSISTED DISPATCHING AND AUTOMATIC VEHICLE LOCATION FOR THE TWIN CITIES METRO AREA. The objective of this operational test project is to continue and expand a system test conducted from March 1999 to February 2000 in the Twin Cities Metropolitan area. This project integrated a CAD software system with AVL for a metropolitan system test. The test employed eight maintenance vehicles equipped with portable MDT. The CAD software was loaded on a dedicated host computer located at a MNDOT Dispatch Center. The project extension seeks to continue this project by upgrading the CAD/AVL system to employ ruggedized MDTs, improve user interfaces, and install the MDTs in an additional twenty-two maintenance vehicles. Other features of the upgrade include snowplow sand and salt spreader status in a database. ITS Funding: $100,000; Total Funding: $200,000

ACTIVATION OF LOW VOLUME HRIs USING PASSIVE TRAIN DETECTION. This operational test will build on the success of the In-Vehicle Signing Project. The original project evaluated an in-vehicle warning system installed on school buses in Glencoe, MN. The system was installed primarily at signalized railroad crossings, and subsequently at unsignalized (passive) crossings. The FY 2000 project will expand the system to provide both active roadside warning coverage at passive crossing areas and in-vehicle signing to regulated and emergency vehicles in rural areas. The system is designed for use at locations without an existing source of power. The goal of the project is to enhance safety at highway/rail intersections. The most significant improvements are expected at low volume intersections where cost considerations preclude deployment of traditional warning systems. ITS Funding: $500,000; Total Funding: $1,000,000

ENHANCEMENT AND EVALUATION OF THE MOORHEAD ADVANCED TRAIN DETECTION PROJECT. The purpose of this operational test, Moorhead Area Integrated Train Detection and Traffic Control System Project, is to develop an integrated system for detection of trains so that special timing plans can be selected when trains are approaching and when trains are present. It will also provide travelers and dispatchers with information on the train movements. A train detection system is needed because an average of 70 trains per day pass through the City of Moorhead's Central Business District (CBD) on tracks that cross many local and arterial streets at-grade. This project will address the following problem conditions: Safety concerns at high-volume at-grade railroad crossings; increased emergency vehicle response time when trains are present; interruption of transit operations when trains are present; and extensive vehicular delays when trains are present. This project proposes the concept of an ITS type technology solution that provides many of the traffic-related benefits of the construction solutions, and at a much lower cost and significantly greater ease of implementation. The basic concept involves integrating advanced train detection with the signal system. Trains would be detected and

that information would be conveyed to the traffic signal system. The traffic signal system would then employ a special timing plan that would be developed to serve the traffic movements that exist when trains are passing through the city. The following project goals have been developed:

- Reduced delay due to: Improved signal timing, specifically when trains are present; and providing real time information to motorists to enable them to select alternate grade crossings or divert to a grade separated crossing.

- Provide Train information to: Emergency vehicles and transit operators.

- Improved safety due to: Reduced exposure at at-grade crossings; reduced conflicts with emergency vehicles, for auto and train traffic.

ITS Funding: $100,000; Total Funding: $200,000

MINNESOTA RESEARCH PROGRAM. The Minnesota ITS Research Program is intended to support ITS deployment and integration by researching and developing tools to improve the various ITS user services. In some cases, the program initiates research in new areas that will expand knowledge which ultimately will improve a particular ITS initiative. A portion of the research funding supports the administrative structure which advances ITS research at the University of Minnesota.

ITS Funding: $859,375; Total Funding: $1,718,750

Project Location: Statewide throughout Minnesota

Partner(s): Minnesota DOT is lead and other partners include: Federal, State and local agencies and private companies interested in the evaluation and deployment of ITS user services and technologies. Principal State agencies include University of Minnesota, Minnesota State University; Department of Public Safety and the Minnesota State Highway Patrol

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Start Date: September 2000

***End Date*:** Ongoing

Estimated Total ITS Funds: $5,504,947

Estimated Total Project Cost: $11,018,750

Contacts:

James McCarthy	FHWA Minnesota Division, HPO-MN	(651) 291-6112
James Kranig	Minnesota DOT	(651) 296-8567
Sara Lenz	Smart DARTS: Minnesota DOT Office of Transit	(651) 296-3441
Marilyn Remer	AUSCI Expansion: Minnesota DOT	(651) 582-1601
Mike Sobolewski	Arch/Stds: Minnesota DOT, Metro Division	(651) 582-1602

MINNESOTA GUIDESTAR PROGRAM - FY 2001

Description:

This section describes the FY 2001 ITS Integration Program developed by Minnesota Guidestar. Minnesota's statewide, integrated ITS program is a multi-year activity guided by a Board of Directors providing strategic direction and oversight of ITS research, field operational tests, deployment support, deployment and integration projects throughout the state. In some cases, projects are continuations of TEA-21 Deployment Program initiatives begun in earlier years. The point of contact for all of these FY 2001 projects, unless otherwise indicated, is James Kranig, MNDOT (651) 296-8567.

ITS INTEGRATION AND DEPLOYMENT SUPPORT-UNIVERSITY OF MINNESOTA, CENTER FOR TRANSPORTATION STUDIES - This project provides administrative support for the definition of ITS projects to be adopted as part of the Minnesota Guidestar Program. The University of Minnesota's Center for Transportation Studies (CTS) coordinates and manages the solicitation of proposals for ITS integration and deployment projects to be incorporated in the State's Statewide Transportation Investment Program. This project will facilitate inter-jurisdictional ITS deployment and integration activities by providing tools for addressing and coordination issues likely to emerge from proposed ITS projects. This project is centered on the management of Federal Work Orders approved by the FHWA Division Office and State Work Orders negotiated between MNDOT and the University of Minnesota. ITS Funding: $807,792; Total Funding: $1,615,584. Start Date: 9/30/01; End Date: 12/31/03

TOCC INTEGRATION AND DEPLOYMENT-PHASE II - This project continues and builds on a deployment project initiated in 1998 to improve joint agency communications, safety and efficiency. Evolving from an ISTEA-era field operational test, Advanced Rural Traveler Information Center (ARTIC) which demonstrated the value of centralized communications centers, this project will ultimately deploy nine collocated Transportation Operations Communications Centers throughout rural Minnesota. MNDOT and the Minnesota Department of Public Safety-State Patrol will combine their resources to improve emergency response, maintenance operations, and dispatching efficiency. ARTIC brought together MNDOT, State Patrol and rural transit agencies; tested automated vehicle location and mobile data terminals; explored ways of employing advanced communications systems, and tested advanced transit scheduling/dispatching capabilities. The primary function of the TOCC is to coordinate and control communications related to travel on the State highway system. This appropriation will be allocated to implementing various features of TOCC upgrades/integration at three locations. ITS Funding: $1,000,000; Total Funding: $2,000,000. Start Date: 6/30/01; End Date: 3/31/03.

TH 51 ITS INTEGRATION AND DEPLOYMENT PROJECT - STAGE 2. This project focuses on an arterial (Trunk Highway 51 - Snelling Avenue) which supports thousands of trips per day, but traverses three jurisdictions. The segment of TH 51 affected by this project extends from St. Paul through the cities of Roseville and Falcon Heights in Ramsey County. MNDOT operates nine traffic signals along this trunk highway while local agencies operate over twenty signals in close proximity. Phase I of this project conducted an evaluation of technologies suited to transmission of and control of CCTV video and data. This project - stage 2 - will deploy twisted pair technology throughout the corridor, and a control system for traffic signals, CCTV cameras, and dynamic message signs. ITS Funding: $100,000; Total Funding: $200,000. Start Date: 9/30/01; End Date: 1/31/03.

EXPANSION OF INTELLIGENT VEHICLE INITIATIVE INFRASTRUCTURE - This project is a cooperative endeavor involving FHWA, the Intelligent Vehicle Initiative (IVI)-Specialty Vehicle Platform Steering Committee, the IVI Infrastructure Consortium, and the Cooperative Vehicle Automation System Pooled Fund Study. The project seeks to improve safety and mobility by focusing on vehicle and infrastructure components in anticipation of future communication between vehicles and infrastructure components. The project will deploy one or more of the following systems upon completion of an infrastructure requirements analysis: Pavement magnetic tape to assist vehicle guidance; differential

GPS to assist vehicle guidance; intersection collision warning systems; variable speed limit systems. Priority locations include non-freeway designated interregional corridors throughout the State which experience severe low visibility conditions, dangerous curves and a high incidence of intersection crashes. POC: William Gardner, MNDOT (612) 282-2115. ITS Funding: $300,000; Total Funding: $600,000. Start Date: 9/30/01; End Date: TBD

INTERREGIONAL CORRIDOR ITS PLAN - This project evolves from an Interregional Corridor (IRC) Study to identify important economic corridors in the State. This IRC study identified performance standards for mobility and safety as well as defining improvement strategies to reduce congestion and manage incidents. A study finding recommended identification of IRC Technology Demonstration Projects to address corridor performance shortfalls. This project will examine regional and interregional corridors falling below target mobility levels, both currently and in the future. Once candidate corridors are identified, focus groups will be conducted to establish priorities for potential ITS demonstration projects. Once candidate corridors have been selected, detailed implementation plans will be developed. The final phase of this project will deploy ITS Demonstration projects. Two trunk highways have been identified as candidates along with potential ITS technology applications for each. ITS Funding: $1,050,000; Total Funding: $2,100,000. Start Date: 9/30/01; End Date: 12/31/03.

EXPANSION OF AND SUPPORT FOR HRI PROJECTS - This project is a continuation of FY 2000 ITS Integration Program Highway Rail Intersection (HRI) initiatives. The FY 2000 HRI projects evaluated an in-vehicle warning system installed on school buses in Glencoe; the activation of low volume HRIs using passive train detection, and enhancement of the Moorehead advanced train detection project. FY 2001 funding will expand on all three legacy HRI projects. MNDOT seeks to determine a means of delivering a low-volume HRI component to a national strategic plan for HRI deployment, while concurrently meeting local transportation needs. This project will conduct a long-term operational test of ITS technologies such as passive train detection, RF communications, and LED active warning systems at approximately 100 low-volume crossings. Operational test evaluation efforts will focus on long-term performance and maintenance requirements to ascertain feasibility of wide scale deployment. This project's primary outputs are providing support in three areas: management, outreach and evaluation. ITS Funding: $250,000; Total Funding: $500,172. Start Date: 9/30/01; End Date: TBD

MAYDAY - PHASE II - This project's objective is to expand the development and testing of an integrated emergency response infrastructure capable of processing data and voice messages from commercial Mayday systems. This infrastructure is to be deployed and tested throughout numerous counties in urban and rural areas of the State. The project will integrate global positioning system devices, in-vehicle sensors, satellite and cellular phone technology, emergency response systems, and traffic management centers to provide automatic notification of crash location and severity as well as required response management. The emergency detection and response infrastructure established by private sector entities which enables motorists to transmit distress signals to emergency responders (such as OnStar) will be integrated with public sector emergency facilities. The system design will enable public sector dispatch center personnel to activate appropriate response resources by accessing private sector emergency distress signals transmitted in the event of a crash. ITS Funding: $500,000; Total Funding: $1,000,000. Start Date: 9/30/01; End Date: TBD

AUSCI EXPANSION TO TH 55-PHASE II - This project is a continuation of a FY 2000 initiative whose purpose is to expand Adaptive Urban Signal Control and Integration to Trunk Highway 55. TH 55 is a high volume arterial with multi-phase traffic signal systems. While this corridor currently operates in a coordinated mode, the introduction of a planned at-grade express transit system will degrade, during peak traffic flows, the coordinated signal system. The approach is to collect light rail vehicle location information using automatic vehicle location/Global Positioning System (AVL/GPS) technology integrated with appropriate transmitting/receiving equipment. Additionally, recently deployed SCOOT

intersection control systems will be extended to intersections in the TH 55 corridor as a complementary enhancement, thus providing a corridor-wide response to light rail vehicle operation. Phase 1 of this project was dedicated to design and development of software modifications for Minneapolis' traffic control system. This project implements phase II which is dedicated to designing, procuring and installing detection for Scoot in the corridor. ITS Funding: $50,000; Total Funding: $100,000. Start Date: 9/30/01; End Date: 3/31/03

ITS OPERATIONS AND MAINTENANCE WITH INTERAGENCY RESOURCE OPTIMIZATION - This project is a deployment support initiative whose purpose is to establish various regional maintenance support contracts to be used by local agencies to facilitate the repair of ITS components and other traffic control equipment. This activity is a continuation of a FY 2000 initiative which produced a report defining requirements for and challenges to establishing a comprehensive maintenance program. The regional maintenance contracts will be structured to support routine, preventive and emergency maintenance tasks. A portion of funding is to be allocated to purchase of critical system component spare parts, and to establish a pooled fund for emergency requirements. ITS Funding: $200,000; Total Funding: $400,000. Start Date: 9/30/01; End Date: 3/31/03

TWIN CITIES METRO-AREA ITS INTEGRATION PROJECT - This project is a compilation of separate, small ITS integration activities to be implemented in the Twin Cities Metropolitan area. The completion date identified below is the end date of the initiative with the longest estimated duration. Where possible individual initiative completion dates are listed in the following summary of subprojects:

- I-494 CONGESTION MANAGEMENT - This subproject will provide real-time road congestion information and alternate routing information to operators of transit vehicles, freight carriers and shippers prior to their entry into the corridor. A combination of existing technologies (kiosks, terminals, Internet) and route planners will be used to deliver the information. December 2004.

- UPDATE OF ARTERIAL TRAFFIC STATUS SYSTEM - This subproject will expand and enhance the Arterial Traffic Status System (ATS). ATS provides signal system operators with current and historic information about traffic conditions.

- UPDATE OF DATA DISTRIBUTION NODES AND MAP APPLICATION - The Data Distribution Nodes and Map provides traffic system operators with current and historic information about traffic conditions. This tool supports traveler information providers. The enhancements will improve MNDOT's information sources. June 2003.

- INTEGRATION OF MNDOT AVL WITH MSPCAD - This subproject will improve the communication between the State Patrol and MNDOT. Operations of the two agencies will be integrated, and will establish a shared role in detecting, verifying, responding to and clearing incidents from the roadway network. January 2003.

- MODIFICATION OF I-494 INTEGRATED CORRIDOR SYSTEM - This subproject will upgrade traffic control and communication within the 494 corridor. This initiative will address malfunctioning components and provide enhanced control equipment. January 2003.

ITS Funding: $412,000; Total Funding: $824,000. Start Date: 9/30/01; End Date: 12/31/04

ATIS/5-1-1 DEPLOYMENT - This project will implement Minnesota's 5-1-1 traveler information program. Existing traveler information systems will be integrated, user access will be converged into a single delivery point. Design and testing of Minnesota's 5-1-1 system will be pursued in several steps:

- Concept Definition.

- Analyses of existing databases.

- Preparation of an Implementation Strategy.

- Conduct of Market Research and Human Factors analyses to define user requirements.

- Coordination with Local Exchange Carriers.
- Operational testing.

ITS Funding: $500,000; Total Funding: $1,000,000. Start Date: 9/30/01; End Date: 1/31/03

Project Location: Statewide

Partner(s): FHWA, Minnesota DOT, University of Minnesota, Department of Public Safety, Minnesota State Highway Patrol

Start Date: September 2001

***End Date*:** Ongoing

Estimated Total ITS Funds: $5,158,000

Estimated Total Project Cost: $10,339,756

Contacts:

James Kranig	Minnesota DOT	(651) 296-8567
William Gardner	Minnesota DOT	(651) 282-2115

OREGON REGIONAL ITS INTEGRATION

Description:

This project is comprised of the FY 2000 and FY 2001 ITS Integration earmark for the State of Oregon. The Portland metropolitan region has adopted an aggressive program of ITS projects including implementation of operational systems in accordance with a regional cooperation concept that guides integrated planning in support of a safe, efficient, accessible and sustainable transportation system. The regional transportation stakeholder committee, the Transport 2000 Partnership, has developed a consensus-based vision for a statewide and regional ITS program. The vision merges near-term expansion of ITS capabilities achieved by reusing existing infrastructure and using infrastructure under development with a needs-driven, incremental deployment of new infrastructure. The FY 2000 earmark is comprised of ten subprojects. The FY 2001 ITS Integration earmark adds to this foundation with increased funding for selected subprojects and by initiating a new project. These projects will contribute to: accelerating integration of regional ITS in multi-jurisdictional metropolitan and rural areas; improving safety and efficiency in regional movement of people, goods and services; improving safety and efficiency of regional traffic flow including inter-modal transfer of passengers and freight at international ports of entry; integrating and improving the scope, content and distribution of high quality intermodal traveler information; creating a sustainable business environment for private sector traveler information service and transportation system providers; efficiently building on both operational and concurrent deployment of regional ITS infrastructure. The project inventory is summarized as follows:

- Regional Intermodal Transit Traveler Information and Security System

- Transit Buses as Traffic Probes

- Regional ATIS Sustainable Business Model Deployment (FY 01 earmarked funding added)

- Regional Transportation Status Web Site (FY 01 earmarked funding added)

- I-5/Barbur Blvd. Demonstration Corridor for Traffic Monitoring, Incident Management, and Traveler Information

- Inter- and Multi-modal Traffic and Parking Management at Portland International Airport

- Oregon Transportation Network Statewide Transit Trip Planning (FY 01 earmarked funding added)

- TOC design & RFP development

- The Oregon Advanced Travel Information System (ATIS) improvement project

- US 199

- Transit Tracker (Real-Time Customer Information Displays (FY 01 earmark)

REGIONAL INTERMODAL TRANSIT TRAVELER INFORMATION AND SECURITY SYSTEM - This project will deploy the Phase I increment of an integrated and upgraded regional, multi-modal Traveler Information and Security System. This system will serve transit riders with enhanced or new capabilities for access to pre-trip planning, fare and bus schedule information, en-route rider information, and traveler information on intermodal choices and transfer points. This system will ultimately provide the service on rail platforms, transfer points and for intermodal ground transport options at Portland International Airport to facilitate the safe and efficient use of regional transit systems. Initial site deployments scheduled for 3/31/2001. ITS Funds - $50,000; Total Funds - $1,074,000.

TRANSIT BUSES AS TRAFFIC PROBES - This project will develop and deploy an integrated regional subsystem to collect and process real-time transit bus operational data,

and effectively apply that data for use as traffic probe data in determination of regional arterial traffic network status. This enhanced information will then be disseminated to the public as added content for the Regional Transportation Status Web Site and as value-added arterial data for presentation at the ATIS Sustainable Business Model - both of these projects are described below. The project also provides baseline near-term integration opportunities for information sharing between Tri-Met bus and City of Portland arterial traffic management operations. This integrated baseline then facilitates broader regional transit information sharing for both Tri-Met and (potentially) C-TRAN for enhanced wide-area arterial traffic probe surveillance-including the I-5 primary bi-state commuter corridor, and for enhanced and more complete regional transportation system status as traveler information disseminated by the public sector or ISPs. Completion scheduled for 4/2003. ITS Funds - $50,000; Total Funds - $125,000.

REGIONAL ATIS SUSTAINABLE BUSINESS MODEL DEPLOYMENT - This project conceptualized, designed, developed and deployed an initial regional public sector traffic and transit information interface that then enables one or more ISP-integrated regional traveler information subsystems to provide pre-trip travel information, en-route driver information, route guidance and traveler services information to subscribers and the general public. This project goal is to ultimately bring all regional public sector real-time and near real-time operational data, and static information to a common and well-defined regional interface. The content is derived from architecture flow interfaces to Traffic Information Dissemination from operations at ODOT, WSDOT and regional counties and municipalities, Transit Fixed-Route Operations at Tri-Met and C-TRAN, and Parking Facility Management at Portland International Airport. The project provides the ideal baseline near-term integration opportunities for information sharing public-private and public-public. This project includes the identification and initial regional integration of data from ODOT, City of Portland, Tri-Met and Port of Portland. This regional integrated baseline will then facilitate a sustainable information source for regional transportation system status for use by regional ISPs. Complete. ITS Funds - $75,000; Total Funds - $75,000.

REGIONAL TRANSPORTATION STATUS WEB SITE - This project effort will develop, integrate and deploy the infrastructure, content and presentation to implement an initial regional transportation systems web site that provides a full-spectrum of seamless, inter-modal traveler information to the general public. This site also provides a secure mechanism for public agencies and other authorized users to share operational information. The ODOT regions and several local jurisdictions have developed and deployed informative web sites with reasonably thorough content and presentation, and with cross-links to each other. This approach has been cost-effective, successful and beneficial in specific information markets but has yet to realize the full potential of an integrated, seamless regional and statewide transportation and traveler information source. This project proposes the integration and enhancement of these sites to provide a full-spectrum of seamless regional, statewide and multi-jurisdictional bi-state (OR-WA, ID and CA) transportation content and presentation. This full-spectrum of traveler and transportation status information will include: congestion on freeways, state highways and metropolitan arterials, incidents affecting traffic flows, special events, tourism, weather, video snapshots, construction both planned and in-progress, road closures and restrictions. Also proposed is that this integrated web site will have content appropriate for distribution to the general public as well as a separate secure controlled-access area for use by public agencies or authorized users to exchange non-mission critical or event related data (e.g., bulk or specific event data and traffic images for incident management and tracking, law enforcement, trauma centers, etc.). Concurrently with definition and the initial building of a sustainable data interface in the Regional ATIS Sustainable Business Model Deployment, this project provides immediate near-term integration opportunities for web-based dissemination of information already available but not yet collected and fused into a unified regional or statewide context and presentation. This integrated baseline Web site then forms the model for more cost-effective regional or statewide transportation information dissemination and public access. Completion 4/2003. ITS Funds - $75,000; Total Funds - $115,000.

I-5 SOUTH / BARBUR BLVD DEMONSTRATION CORRIDOR FOR TRAFFIC MONITORING, INCIDENT MANAGEMENT, AND TRAVELER INFORMATION - This project will complete a comprehensive implementation along SW Barbur Boulevard and I-5 in this arterial-freeway corridor from the junction with I-405 on the north to the City of Portland/Tigard city limits on the south. The project will install dynamic message signs, CCTV cameras, traffic monitoring stations and fiber communications media. The project will integrate these roadside devices with the ODOT TMOC and the City of Portland's legacy Series 2000 central computer system, and will establish the architectural and NTCIP-based framework for future integration with the city's planned replacement system, and will facilitate the future integration of additional NTCIP-based roadside and center-to-center information sharing. The project is expected to deploy and integrate one DMS and one CCTV on I-5, six DMS/CMS and four CCTV on Barbur Blvd, and two additional detector loop stations on I-5. This project provides near-term integration opportunities for information sharing between ODOT Region 1 freeway operations and City of Portland arterial traffic management operations. This integrated baseline then facilitates broader regional corridor optimization through enhanced wide-area surveillance and corridor traffic management and control opportunities. Completion 4/2003. ITS Funds - $100,000; Total Funds - $465,000.

INTER- AND MULTI-MODAL TRAFFIC AND PARKING MANAGEMENT AT PORTLAND INTERNATIONAL AIRPORT - This project will deploy a Traffic, Parking Management and Traveler Information System at Portland International Airport with regional connectivity to provide traffic (public and commercial) management, remote traveler support and parking management functions. The integration of center-to-center connections will include ODOT Region 1 TMOC, City of Portland TOC, Tri-Met Central Operations & Dispatch and Port of Portland Marine and Planning facilities. This project will integrate the PDX parking management and access roadway status into the regional network system through shared Tri-Met communications to the ODOT TMOC. The project provides initial near-term integration opportunities for parking and access roadway status information sharing between Portland International Airport, ODOT Region 1 TMOC, City of Portland TOC and Tri-Met bus and rail operations. This integrated baseline then facilitates future regional integration of airport multi-modal traveler information sharing for seamless regional and statewide traveler information access. Completion of Regional Integration 4/2003. ITS Funds - $75,000; Total Funds - $219,000. In FY 2001 $35,000 in matching funds was added.

TRANSIT TRACKER (REAL-TIME CUSTOMER INFORMATION DISPLAYS) - The objective of this project is to develop and deploy an integrated regional system to collect, process and disseminate real-time transit information to the transit mall, rail platforms, transit centers, bus shelters, and via the Internet and other external displays. The information will enable transit riders to choose buses capable of providing quickest service to destinations and schedule delay information. $350,000.

OREGON TRANSPORTATION NETWORK STATEWIDE TRANSIT TRIP PLANNING - This project will develop a "one stop shopping" information system for public transportation users. The OR public transportation system is comprised of over 200 public and private transit providers. These services are varied, geographically dispersed and operate independently. This project seeks to integrate multiple transit providers and provide a central trip planning system with detailed statewide, inter-jurisdictional information. Total Funds FY 00: $70,000; FY 01: $350,000.

TOC DESIGN & RFP DEVELOPMENT - This project will scope, phase and define the requirements, hardware and software to be used at the regional Transportation Operations Centers (TOC) outside of Portland. This TOC operations system will provide the functionality needed in a primarily rural setting, integrate the operation of the various roadside systems deployed, and integrate with systems used by other agencies (e.g., cities, Oregon State Police, CalTrans, and the California Highway Patrol). ITS Funds - $50,000; Total Funds - $100,000.

THE OREGON ADVANCED TRAVEL INFORMATION SYSTEM (ATIS) IMPROVEMENT

PROJECT - This project will make a number of enhancements to ODOT statewide and regional ATIS capabilities. ODOT has made a commitment to providing travelers with up to date road condition information. ODOT has deployed operational capabilities in ATIS capabilities like Travel Advisor, Trip Check, 1-800 # phone systems, and supporting systems that collect roadway status information like the HTCRS and in Region 1, the TransPort 2000 ATMS. ODOT has a long-term commitment and dedication of significant staff time to continued collection and dissemination of this essential road condition information. Project underway in FY 2000. Planned operational date 10/2001. ITS Funds - $30,926; Total Funds - $98,852.

US 199 - This project, together with a complementary project in California, will provide better coordination among the agencies involved in managing this I-5-to-coastal corridor through providing more complete real-time status information to operations personnel. The project will also improve traffic and roadway status information dissemination to drivers experiencing adverse weather and road closures. Project underway in FY 2000. Planned operational date 4/2001. ITS Funds - $125,495; Total Funds - $125,495.

Project Location: Portland, Oregon and surrounding cities and counties-urban and metropolitan areas.

Partner(s): FHWA, Oregon DOT, TransPort 2000 Partnership; City of Portland; Port of Portland; Tri-Met Transit; Battelle TransPort 2000 Team

Start Date: September 2000

***End Date*:** October 2003

Estimated Total ITS Funds: $1,382,944

Estimated Total Project Cost: $3,869,870

Contacts:

Nathaniel Price	FHWA Oregon Division, HDA-OR	(503) 587-4709
Galen McGill	Oregon DOT	(503) 986-4486

SOUTHERN STATE PARKWAY

Description:

This program 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 has initiated the program with an investigation into how this work 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.

Two specific projects are also being conducted as part of this program. The Traffic Flow and Visualization Control (TFVC) project investigated a video-based vehicle detection, visualization and management system which employs leading edge technology developed in the military. Through the user of advanced video data processing, neural network analysis and intelligent command and control technologies, the traffic adaptive system will identify and alert the system operator to real-time traffic conditions such as recurring congestion, non-recurring incidents, and other traffic problems normally associated with freeway operations. The system has been successfully demonstrated in the laboratory and was field tested at thirty locations along the Long Island Expressway as part of the INFORM corridor. This program was being handled as an element in the Southern State Parkway program through an interagency agreement with the U.S. Air Force. One of the national labs, Rome Laboratory, is being utilized as the project manager.

A second project developed a traffic congestion forecasting model for the INFORM System. This project supported the development of a computerized traffic forecasting model by the Brookhaven National Laboratory. The model is called ATOP for Advanced Traffic Occupancy Prediction. The model will eventually take on-line traffic data from INFORM system roadway sensors on Long Island and make projections as to future traffic patterns using the following routines:

* Statistical forecasting of traffic flow and occupancy using long and short term information
* Estimation of the relationships between traffic flow and occupancy
* Statistical detection and classification of anomalies and their impact on highway capacity
* Adaptive correction and updating to control prediction errors

The final report, titled "Traffic Congestion Forecasting Model for the INFORM System," is available from the National Technical Information Service and ITS America.

The final report for the Traffic Flow and Visualization Control Project has been submitted to FHWA.

Project Location: Long Island, New York

Partner(s): New York State DOT, USAF Rome Laboratory, Brookhaven National Laboratory

Start Date: September 1993

***End Date*:** December 2003

Estimated Total ITS Funds: $13,420,000

Estimated Total Project Cost: $31,212,500

Contacts:

Mike Schauer	FHWA New York Division, HTS-NY	(518) 431-4125	Ext. 236
Emilio Sosa	New York State DOT	(631) 952-6733	

STATE OF MISSISSIPPI ITS INTEGRATION PROJECT

Description:

The Mississippi Department of Transportation is currently working on two projects to be funded by ITS funds. These projects are as follows:

- The MDOT Office of Enforcement in collaboration with the Planning Division will fund 10 additional Weigh In Motion (WIM) sites. These new sites, in conjunction with the other 19 sites, will provide statewide vehicle data to all participating project partners.

- A Statewide feasibility study will be conducted to help determine traffic needs that can be enhanced with the implementation of an ITS. The study will look into all aspects of transportation and will consider benefits to the MDOT as well as the traveling public. These implementations to the traffic network will be shown using the National ITS Architecture. The consultant will also research means to make WIM available, via the internet or through a database, to all partners.

Project Location: State of Mississippi

Partner(s): Mississippi DOT, Mississippi Public Service Commission, Mississippi Trucking Association

Start Date: January 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $441,470

Estimated Total Project Cost: $883,000

***Contacts*:**

Mike Cribb	FHWA Mississippi Division, HDA-MS	(601) 965-4228
Scott Carson	FHWA Mississippi Division, HDA-MS	(601) 965-4232

TRANSCOM CONGESTION MANAGEMENT PROGRAM

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 ITS-related technologies in the metropolitan area, and others are under development. 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 "ITS Regional Implementation Strategy," a program for coordinated implementation of ITS 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.

Operational tests which were conducted under this program (TRANSMIT, Alternate Bus Routing) are described in the “completed projects” section of this chapter.

Project Location: New York, New Jersey

Partner(s): New York State DOT, New Jersey DOT, TRANSCOM and other member agencies

Start Date: January 1990

***End Date*:** Ongoing

Estimated Total ITS Funds: $17,325,000

Estimated Total Project Cost: $21,700,000

***Contacts*:**

Keith Sinclair	FHWA New Jersey Division, HTC-NJ	(609) 637-4204	
Mike Schauer	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 236
Tom Batz	TRANSCOM	(201) 963-4033	

UTAH ITS INTEGRATION

Description:

This project will continue the planning, design and deployment of ITS infrastructure in conformance with established regional priorities identified in ITS Early Deployment Planning as amended by the Salt Lake Olympic Committee. The following activities comprise the initiatives which will be pursued:

- Expansion of the Utah DOT Incident Management Program;
- Improvement of advanced traveler information systems;
- Expansion of the Regional Advanced Traffic Management System;
- Automatic Vehicle Locating for Olympic Athlete and Olympic Family Vehicles;
- Expand the functionality of University of Utah Research Traffic Operations Center to support Olympic operations, to support system testing, evaluation and research activities.

Project Location: Salt Lake City Area

Partner(s): Federal Railroad Administration, Utah DOT, Salt Lake Olympic Committee, Wasatch Front Regional Council, Salt Lake County Department of Public Works, Salt Lake City Transportation Division, Utah Transit Authority, Mountainlands Association of Governments, Utah Department of Public Safety Highway Patrol, Salt Lake City Airport

Start Date: September 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $2,849,290

Estimated Total Project Cost: $11,349,290

***Contacts*:**

Russell Robertson	FHWA Utah Division, HPM-UT	(801) 963-0078	Ext. 229
Martin Knopp	Utah DOT	(801) 965-4894	

UTAH STATEWIDE

Description:

This project is the FY 2002 ITS Integration Program Utah Statewide earmark. The project is an expansion of the Utah DOT's deployment of ITS technologies in the Salt Lake City Metropolitan area in recent years known as the CommuterLink system. FY 2002 funding will be focused on expanding the CommuterLink system on a broader geographical basis. Four priority initiatives comprise this project:

- Integration: Enhancing the CommuterLink Advanced Traffic Management System and Advanced Traveler Information Systems Web site. The Web site will be updated to reflect system-wide, recently deployed improvements. There is a priority on integrating communications with remote traffic signals and closed loop systems.

- CVISN: Electronic Credentialing will be a major focus needed to achieve Level 1 status in deployment of Commercial Vehicle Information Systems and Networks.

- Rural Deployments: Deployment of Highway Advisory Radio and Road Weather Information Systems will be emphasized at key rural locations. Concurrently, Utah's 511 traveler information system will be expanded in rural areas.

- Evaluation: Deployment and integration activities conducted during the period of execution in this project will be evaluated as part of the project.

Project Location: Utah

Partner(s): FHWA, Utah DOT

Start Date: September 2002

***End Date*:** June 2003

Estimated Total ITS Funds: $463,298

Estimated Total Project Cost: $926,596

***Contacts*:**

Russell Robertson	FHWA Utah Division, HPM-UT	(801) 963-0078	Ext. 229
Richard Manser	Utah DOT	(801) 887-3718	

WASHINGTON, DC METROPOLITAN REGION ITS INTEGRATION

Description:

The purpose of the ten project activities described here is to improve transportation services and enhance the quality of life for residents and visitors to the National Capital Region. The multi-year program is being guided by the Metropolitan Washington Council of Governments' ITS Task Force, and adheres to regional strategic planning documents. The subprojects are grouped by responsible agencies having oversight responsibilities.

MARYLAND STATE HIGHWAY ADMINISTRATION

Subproject: ITS Training ($250,000) - Funding will be provided to universities and technology transfer centers serving the region to provide high priority training for those responsible for planning, developing, operating and maintaining ITS. The training will follow five tracks:

- Information Technology
- ITS Systems Technology
- ITS in Transportation
- Management
- Public Policy

Subproject: Automate the Interface Between Montgomery County, Maryland ATMS and Partners in Motion/Smart Traveler ($250,000) - In conjunction with modifications that are being made to the regional traveler information project called Partners in Motion, four public agencies will integrate their software with that project's software suite. Virginia Railway Express, Virginia DOT, and Maryland State Highway Administration will integrate software systems with Partners in Motion. Montgomery County will integrate its Advanced Transportation Management System database with Partners in Motion.

Subproject: Advanced Law Enforcement and Response Technology (ALERT) ($500,000) - ALERT is an integrated in-vehicle platform for enforcement, fire, emergency medical services, and other specialty vehicles to provide enhanced public safety and improve incident response and management. ALERT is an on-going project sponsored by FHWA and other federal agencies; it is currently being deployed in the Washington, D.C. region in single vehicles owned by the City of Alexandria Police Department, U. S. Secret Service, and the U.S. Park Police. This project will expand use of these vehicles to Virginia and Maryland State Police agencies and several county police forces in Virginia and Maryland as well as the Washington, D.C. police.

Subproject: Washington, D.C. Regional ITS Architecture ($200,000) - This activity developed a high-level regional ITS architecture for the Washington, D.C. Metropolitan area.

Subproject: Wireless Location Technology Demonstration ($500,000) - This demonstration of the use of cellular location technology for traffic monitoring will take place on the Capital Beltway between the Springfield interchange in Virginia and Forrestville, Maryland. Initially traffic flow will be monitored only on the Beltway. Subject to results, monitoring activities on arterials may be undertaken.

DISTRICT OF COLUMBIA DEPARTMENT OF PUBLIC WORKS

Subproject: District of Columbia Incident Management Plan ($400,000) - The District of Columbia is in the process of implementing an integrated transportation management plan. This initiative, integrated with regional systems in adjacent jurisdictions, will enable the District to activate incident and special event diversion/traffic management plans through

the use of portable signs.

Subproject: Signal Preemption Operational Test ($350,000) - The District of Columbia Department of Public Works recently completed a test of signal preemption for emergency vehicles near a major medical center. This activity will extend and expand this implementation to transit and other vehicles.

VIRGINIA DEPARTMENT OF TRANSPORTATION

Subproject: Signal Priority and Preemption Study and Virginia Operational Tests ($507,348) - The objectives of this activity are to conduct a detailed study of signal preemption/priority issues, and the state of the practice for transit, enforcement, fire and emergency medical services. Based on findings, this initiative will develop requirements and broad policy guidelines for signal preemption/priority for the Washington, D.C. region.

Subproject: Enhance Partners in Motion ($800,000) - The objectives of this activity are to implement Internet-based information technology applications to the Partners in Motion Agency Data Server. The current Agency Data Server will be updated with an Internet-based system to enhance participating agencies capabilities to transmit and receive traveler information. A six-month demonstration will be conducted to alert major employment centers of major transportation incidents impacting employees' ability to travel during business hours.

Subproject: Northern Virginia Regional Architecture ($200,000) - This initiative will expand the Northern Virginia Regional ITS architecture to include agencies and jurisdictions in Northern Virginia which were not included in the previous undertaking to develop a regional framework.

Project Location: Washington, DC Metro Region

Partner(s): Virginia DOT, Maryland State Highway Administration, DC Dept. of Public Works, Metro Washington Council of Governments

Start Date: September 1999

***End Date*:** December 2003

Estimated Total ITS Funds: $3,957,348

Estimated Total Project Cost: $7,914,696

Contacts:

Breck Jeffers	FHWA Maryland Division, HPT-MD	(410) 962-4342	Ext. 129
Frank Mirack	FHWA District of Columbia Division, HDA-DC	(202) 219-3516	
Thomas Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357	
Mike Zezeski	Maryland State Highway Administration	(410) 787-5859	
James Robinson	Virginia DOT	(804) 786-6677	

Integrated Systems - Individual Projects

ATLAS-ITS PHASE IV

Description:

This project is the FY 2001 ITS Integration Program earmark for the State of Arizona. Federal funding was approved and obligated in July 2002. The project lead is the University of Arizona's Center for Excellence in Advanced Traffic and Logistics Algorithms and Systems (ATLAS). This project will demonstrate integration of ITS technologies in five subprojects at different locations throughout Arizona. The projects are defined as follows:

--Tucson's ITS Diamond Interchange is an urban traffic management project which deploys and integrates self-adaptive real-time traffic signal control with freeway management systems using various detector and communications technologies. The adaptive signal control system SMART-RHODES will be deployed.

--Tempe's ITS Public Transit Project will deploy and integrate transit signal priority for a set of buses providing local commuter service between Arizona State University and adjacent neighborhoods. AVL and real-time transit management functionality will be integrated on the demonstration project buses.

--"Deployment of an Approach for Real-time Estimation of Arterial Travel Times." The approach will apply an innovative statistical analysis technique for travel time estimation.

--The subproject titled "Integrating Data Sources for Level of Service Information on Arterials" will develop an operational method to integrate multiple traffic data sources to provide planning and operational-level estimates of arterial service flows and travel times.

--"Deployment of Digital Vehicle/Highway Technology for Safety Enhancement." The primary objective of this project is to develop, test and deploy a safety warning system using high precision digital road maps, and various vehicle status sensory techniques. The basic technological concept is that if a vehicle "knows" within centimeters its location and roadway geometry, drivers may be warned of impending hazardous situations using state of the art vehicle sensory and geo-location technology.

Project Location: Arizona

Partner(s): FHWA; University of Arizona; Arizona DOT; Cities of Tucson and Tempe; Maricopa County DOT; Siemans-Gardner Transportation Systems; Intelligent Technologies Intenational; PIMA Association of Governments

Start Date: July 2002

***End Date*:** July 2005

Estimated Total ITS Funds: $793,615

Estimated Total Project Cost:

$1,615,049

Contacts:

Alan Hansen	FHWA Arizona Divison, HPR1-AZ	(602) 379-3645	x108
Pitu Mirchandani	University of Arizona	(520) 621-7284	

IDAS MAINTENANCE

Description: This project comprises an Indefinite Quantity Contract (IQC) structured to provide continued maintenance of the ITS Deployment Analysis System (IDAS) software. Activities covered by this IQC include the creation of software maintenance procedures, maintenance of IDAS software, the creation of an IDAS Web site, and sustaining support for IDAS implementation.

Project Location: Oakland, California

Contractor(s): Cambridge Systematics, Inc.

Start Date: April 2000

***End Date*:** May 2003

Estimated Total ITS Funds: $416,828

Estimated Total Project Cost: $444,059

***Contacts*:**

Brian Gardner	FHWA Headquarters - HEPM	(202) 366-4061

NEXT GENERATION SIMULATION (NGSIM) CORE ALGORITHMS AND DATA SETS

Description: The objective of this project is to develop a core of open behavioral algorithms in support of microscopic traffic simulation, with supporting documentation and validation data sets that describe the interactions of multi-modal travelers, vehicles and highway systems, and interactions presented to them from traffic control devices, delineation, congestion and other features of the environment. These products will be openly distributed and made freely available to the broad transportation community.

Project Location: Oakland, CA

Contractor(s): Cambridge Systematics Inc., Dowling & Associates, Siemens Gardner Transportation Systems, Massachusetts Institute of Technology, Kittleson & Associates, Inc.

Start Date: September 2002

***End Date*:** August 2007

Estimated Total ITS Funds: $9,797,273

Estimated Total Project Cost: $9,797,273

***Contacts*:**

John Halkias	FHWA Headquarters, HOTM	(202) 366-2183
Gene McHale	FHWA - TFHRC, HRDO-03	(202) 493-3275

RALEIGH, WAKE CO., NORTH CAROLINA ITS INTEGRATION

Description: The principal purpose of this project is to integrate city and state traffic operations centers to facilitate information sharing. The project also incorporates planning for the integration of light rail and an automated vehicle location component to the city transit system. Major components to be developed with FY 1999 funding include:

- Transportation Management Center to North Carolina State Highway Patrol communication and interface;
- Crabtree-to-City of Raleigh communications and system integration;
- City of Raleigh to Regional Transportation Management Center communication and integration;
- Regional Transportation Management Center (communication hub).

Project Location: Raleigh, Wake Co., North Carolina

Partner(s): North Carolina DOT; City of Raleigh; City of Durham; North Carolina State Highway Patrol

Start Date: September 1999

***End Date*:** June 2003

Estimated Total ITS Funds: $1,582,939

Estimated Total Project Cost: $3,165,878

***Contacts*:**

Max Tate	FHWA North Carolina Division, HDA-NC	(919) 856-4354
Ann Lorscheider	North Carolina DOT	(919) 250-4151

STATEWIDE ITS SURVEY ELEMENT

Description:

This project is a component of the FY 2001 ITS Integration Program State of Nebraska earmark. This project will conduct a statewide survey of transportation users. The survey will be of statewide scope. The respondent pool will be of sufficient size to generate a statistically sound image of transportation user perceptions regarding ITS in Nebraska. The survey will address user awareness of ITS and ITS-related activities since 1997, provide a snapshot of user acceptance of ITS technologies across the state, identify gaps in service of statewide services such as 511, traveler information and provide information regarding the degree of impact of current and planned ITS applications. The results of this survey will be used to set priorities and time frames for deployment and integration of statewide and regional transportation centers; and serve as a guideline for the development of functional requirements. Statewide deployment of DMS and cellular 511 traveler information deployment has been initiated and results of this survey will lead to accelerated deployment within 2 years.

Project Location: Nebraska

Partner(s): FHWA, Nebraska Department of Roads (NDOR)

Start Date: December 2001

***End Date*:** October 2003

Estimated Total ITS Funds: $17,500

Estimated Total Project Cost: $35,000

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977
Jim McGee	NDOR	(402) 471-1811

SUPPORT SERVICES FOR THE FHWA HUMAN FACTORS PROGRAMS - PHASE II

Description:

This on-site technical and administrative support services contract provides assistance to the Human Centered Systems Team (HRDS-07) in Safety R&D in planning, developing, and conducting activities within the highway safety (e.g., speed management, intersections, visibility, and pedestrians/bicycles) and operations areas (e.g., Intelligent Transportation Systems, traffic operations, and travel management). The support consists primarily in conducting in-house human centered systems research, reviewing the research conducted by off-site contractors, analyzing and reviewing specific technical/and or program issues, and preparing documentation to support FHWA in planning, executing, and managing the human centered systems program.

The cost figures reflected below reflect funding for the two base years of this contract. If three option years are implemented, funding would increase accordingly.

Project Location: McLean, VA

Contractor(s): Science Applications International Corporation (SAIC)

Start Date: October 2002

***End Date*:** September 2004

Estimated Total ITS Funds: $600,000

Estimated Total Project Cost: $600,000

***Contacts*:**

Tom Granda	FHWA - TFHRC, HRDS-07	(202) 493-3365

TRANSLINK

Description:

TransLink is an outgrowth of the various programs at the Texas Transportation Institute, including the FHWA ITS Research Center of Excellence. TransLink focuses on linking the various elements of the transportation system together to form a single, integrated, cooperative transportation management system. TransLink takes a systems approach to surface transportation management. TransLink includes a computer traffic laboratory to support office-based research, and a Roadside Equipment laboratory which uses field hardware.

TransLink projects have included:

- Roadside Equipment Laboratory Houston Emergency Services Workshop.
- Using PDAs for Traffic Surveillance Data Collection.
- Wireless ITS and Wireless Application Protocols.
- Using Personal Digital Assistants for TSP Data Collection.
- Train Detection and modifying pedestrian and traffic signals.
- Hardware-in-the-Loop for using simulation models with traffic control equipment.

Project Location: College Station, Texas

Contractor(s): Texas A & M University

Start Date: October 1998

***End Date*:** December 2003

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $8,599,908

***Contacts*:**

David Gibson	FHWA - TFHRC, HRDO-04	(202) 493-3271

WASHINGTON, D.C. REGION ITS INSTITUTIONAL INTEGRATION

Description:

This project is a FY 2001 ITS Integration Program earmark awarded to George Mason University. The University will conduct a research project designed to promote integration of ITS in the Washington, D.C. region at an institutional level. Three of the tasks are opinion surveys, one is the calibration of the "Integration" traffic forecasting model to two Northern Virginia corridors, and one is a study of how ITS can facilitate the improvement of regional logistical systems. A brief description of each task follows.

Task 1 will survey user attitudes towards transportation needs in the greater Washington area, with a focus on the uses of integrated intelligent transportation systems. The heart of the survey will be an assessment of what users expect from the management and operations of the region's surface transportation system, and, in particular, how ITS can contribute to a seamless movement of passengers throughout the region.

Task 2 will study attitudes of elected officials in Northern Virginia towards ITS evaluation. Most currently available evaluation information about ITS is not in a form useful to elected officials. This research will explore what kind of ITS evaluation information elected officials need in order to make informed decision about deployment of ITS.

Task 3 will calibrate the "Integration" traffic forecasting model to the route 1 and route 7 corridors in Northern Virginia. This model can provide the extremely detailed information about traffic flow that is needed to assess the usefulness of ITS technologies, but extensive work is needed to calibrate this model to local conditions.

Task 4 will assess motorist attitudes towards travel time information on I-66. VDOT is currently considering providing to the public travel time information for the stretch of I-66 between Manassas and the Capital Beltway. Before doing so, however, it wishes to assess whether motorists want quantitative travel time information; how they would expect to use this information; what ranges of travel time would be acceptable; under what driving conditions they would want travel time information; what travel distances they want travel time information for; and what levels of reliability would be demanded.

Task 5 will explore how ITS can be used to improve regional logistical systems.

At present, little serious work has been done on how all available ITS tools can be brought together to help create urban-wide freight transport systems able to meet the challenges of the e-commerce era. The proposed research project will examine this issue. One concept, for example, is the so-called "main port", a metropolitan-area collection and distribution center, which receives inter-city shipments and then re-loads these for delivery within the metropolitan area.

Project Location:

Washington, D.C. Metropolitan Area

Partner(s):

FHWA, Virginia DOT (VDOT), George Mason University

Start Date: September 2002

***End Date*:** September 2004

Estimated Total ITS Funds: $492,018

Estimated Total Project Cost: $984,036

Contacts:

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
James Robinson	VDOT	(804) 786-6677
Roger Stough	George Mason University	(703) 993-3171

FAST-TRAC

Description:

FAST-TRAC (Faster and Safer Travel through Traffic Routing and Advanced Controls) combines Advanced Traffic Management Systems (ATMS) and Advanced Traveler Information Systems (ATIS) technologies in Oakland County, Michigan. SCATS, the Australian adaptive real-time traffic control system will be installed throughout Oakland County, Michigan. Traffic detection for real-time traffic control is being provided through the Autoscope video image processing technology. For the ATIS portion of the test, vehicles will be equipped with the Siemens Ali-Scout route guidance system and other drive information systems (Quick-Scout and TetraStar/PathMaster). Infrared beacons installed at critical locations in the network will provide for a continuous exchange of real-time traffic and route guidance information. A Traffic Operations Center will be established, not only as the heart of FAST-TRAC operations, but also as the focus for systems integration. Funding will be allocated to establish required communications links between the Traffic Operations Center and MI DOT's Intelligent Transportation Systems Center.

Project Location: Oakland County, Michigan

Partner(s): Road Commission for Oakland County, Michigan DOT, Siemens Automotive, General Motors, Ford, Chrysler, County of Oakland, AWA Traffic System - America, and University of Michigan

Start Date: June 1992

***End Date*:** March 2003

Estimated Total ITS Funds: $56,410,000

Estimated Total Project Cost: $70,512,500

***Contacts*:**

Morrie Hoevel	FHWA Michigan Division, HDA-MI	(517) 702-1834
Gary Piotrowicz	Road Commission for Oakland County	(248) 858-7250

MONTGOMERY COUNTY ADVANCED TRANSPORTATION MANAGEMENT SYSTEM

Description: This project will enhance Montgomery County's Advanced Transportation Management System to provide integrated transit and traffic management capabilities. The system will include an automatic vehicle location-equipped bus fleet, intelligent in-vehicle units, two-way communications, real time graphics, relational database, monitoring, and control software, transit priority and system information dissemination. Through use of this enhanced information and control capability, the County's Advanced Transportation Management System will be able to more effectively manage transportation.

Project Location: Montgomery County, Maryland

Partner(s): Montgomery County Office of Traffic, Montgomery County Transit, Maryland State Highway Administration, Orbital Sciences Corporation, Automatic Signal/Eagle Signal, RGA Inc.

Start Date: July 1994

***End Date*:** October 2003

Estimated Total ITS Funds: $1,060,000

Estimated Total Project Cost: $1,860,000

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678	
Breck Jeffers	FHWA Maryland Division, HPT-MD	(410) 962-4342	Ext. 129

9-1-1 RDMT PROJECT INTEGRATION

Description:

This project originated as a component of the FY 2000 ITS Integration Program earmark for the State of Texas. The project was extended and augmented by a FY 2001 ITS Integration Program earmark. Funding figures and schedule data depicted reflect the addition of FY 2001 funds and revised scheduling. Several public safety and service agencies in the Austin/Travis County region are actively implementing the upgrade, replacement, and integration of crucial systems, facilities, and operations. These activities present a unique window of opportunity to integrate systems as changes are being made. The electronic exchange of information between systems will enhance existing public safety and service. This project is intended to supplement these existing ongoing efforts.

The FY 2000 project concentrates efforts on the integration, sharing of electronic voice, data, and video, of existing freeway corridor traffic management system, local traffic signal system, and local emergency services management systems. Local emergency management systems involved in this proposal include computer aided dispatch (CAD), mobile data computer (MDC), geographic information system (GIS), and automatic vehicle location (AVL). The technological systems presently involved in the 9-1-1 RDMT Project include 9-1-1 call handling, radio trunking, computer aided dispatch (CAD), mobile data computer (MDC) including Automatic Vehicle Location (AVL), and transportation and transit services (9-1-1 RDMT). Collectively, these 9-1-1 RDMT systems, including an integrated facility into which they can be installed, are essential to the delivery of emergency and transportation services in the Austin and Travis County region. As part of the 9-1-1 RDMT Project, each of these critical systems is in the process of being implemented in various stages and phases as part of a comprehensive planned review, design, specification, and upgrade process. The replacement of these critical systems and their ultimate incorporation into a shared regional emergency communications center capable of supporting these systems will substantially improve emergency service and transportation. The City of Austin and Travis County have established a multi-agency Incident Command System (ICS). The ICS is a management structure designed to optimize use of resources. The FY 2001 component of the project will update the ICS Operations Plan to integrate law enforcement, fire, emergency response, emergency medical services, and emergency management resources. By constructing a single, integrated facility that could potentially be shared with other public safety agencies in the Austin and Travis County region, agencies will be able to maximize the efficiency and minimize the costs of integrated emergency and transportation services delivery for the citizens of the community.

The FY 2000 project will complete a regional ITS architecture, and integrate the Austin/Travis County CAD system, and the City's traffic signal system with TxDOTs Advanced Traffic Management System (ATMS). Information generated by the ATMS is not currently disseminated adequately. The project agencies have designed a regional emergency communications and transportation management center. The FY 2001 project will support establishment of a traveler information service provider to operate in the center.

Project Location: Travis County, Austin, Texas

Partner(s): FHWA, Texas DOT, City of Austin Department of Public Works and Transportation

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $578,035

Estimated Total Project Cost: $1,196,808

Contacts:

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Brian Burk	Texas DOT	(512) 832-7014

ADVANCED TRAFFIC ANALYSIS CENTER - FARGO, NORTH DAKOTA

Description:

This project is the FY 2000 ITS Integration Program Congressionally-directed deployment for Fargo, North Dakota. Federal funding for this project was obligated in February 2002. This project addresses statewide requirements for ITS integration. ITS integration planning and implementation will be conducted through a partnership between North Dakota DOT and the Advanced Traffic Analysis Center at North Dakota State University. Elements of statewide ITS integration include the following initiatives:

- Development of a plan for a Traffic Operations Center (TOC) at ND DOT's Fargo District. Planning for the proposed TOC envisions a statewide information center supporting all operational aspects of the state road system to include freeway monitoring, winter road maintenance, incident management, arterial management, and emergency management.

- Statewide Advanced Traveler Information System services designed to provide weather information through dynamic message signs, information kiosks and Internet access. These enhancements will complement currently available road weather information accessible through free cellular phone service arranged with cellular service providers in North Dakota and South Dakota.

- Winter Operational Maintenance Management improvements. GPS-based Automatic Vehicle Location deployments on snowplows will be assessed to facilitate fleet management.

- Arterial Management improvements to enable traffic signal control integration across agency and jurisdiction boundaries. Initially, the TOC will coordinate interconnected signal controllers.

- Incident Management/Emergency Response planning for implementation of a statewide communications infrastructure capable of coordinating incident management and emergency management operations.

Project Location: Fargo, North Dakota

Partner(s): FHWA; North Dakota DOT; North Dakota State University; Fargo-Moorhead Council of Governments

Start Date: February 2002

End Date: May 2003

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost:

$1,726,057

Contacts:

Steven Busek	FHWA North Dakota Division, HDA-ND	(701) 250-4348
Ed Ryen	ND DOT	(701) 328-2545
Dr. Ayman Smadi	North Dakota State University	(701) 231-8101

ARCHIVED DATA USER SERVICE (ADUS) INTEGRATION WITH THE LAS VEGAS AREA FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)

Description:

This project is the FY 2000 ITS Integration Program earmark for Las Vegas, Nevada. FAST is a major regional transportation endeavor whose objectives include: improvement of surface transportation efficiency and mobility by providing travelers with an optimal mix of choices of mode, route, or time of travel; reduction of incident response and clearance times; improvement of agency staff productivity through better communications and computational tools with which to support transportation management in the region.

This project, which builds on the FY 1999 earmark dedicated to the design of data archiving capability, will focus on the following ITS infrastructure: Integration of the Arterial Management System component with the Freeway Management System component, Implementation of ADUS, Integration of ADUS with FAST, and Interagency integration to achieve information sharing.

ADUS implementation will enable storage of data at periodic intervals. Data will be accessible to all stakeholders and entities, public and private, managing tourist activities. The proposed ADUS implementation and integration with FAST will provide Las Vegas area stakeholders with a resource that can receive, collect and archive operational ITS-generated data for real-time and non real-time users. The primary Las Vegas area stakeholder requirements to be supported by ADUS will, at a minimum, include:

- short- and long-range planning
- transportation system monitoring
- transit management
- air quality analysis
- safety analysis
- inter-modal planning
- transportation research
- emergency management planning

This project covers the procurement, installation, integration and testing of vendor supplied system hardware and software, as well as the development, installation, integration and testing of the application software required for the above components. The project will be comprised of ADUS central system equipment and communication system components that link the central system component to the field components. The central component will consist of the central system software elements, central system network servers, databases, user workstations, archive storage devices, and associated support equipment located at the FAST Traffic Management Center (TMC). The communication system component will consist of the hardware devices and software located at the TMC and at remote agency sites that interface to the ADUS central system component. The integration of the arterial and freeway components of the FAST system involves:

- Interconnecting the central servers of each of the two systems in support of center-to-center communications;

- Integrating the implementation of diversion strategies in response to incidents using equipment and resources from both systems;

- Integrating the control of the CCTV cameras of the two systems; and

- Integrating the video display of the two systems.

Project Location: Las Vegas, Nevada

Partner(s): FHWA; Nevada DOT; Clark County; Regional Transportation Commission of Clark County; Cities of: Las Vegas, Henderson, North Las Vegas; Nevada Highway Patrol; Metro Police; McCarran International Airport

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $2,200,000

Estimated Total Project Cost: $4,500,000

***Contacts*:**

Jim Allen	FHWA Nevada Division, HDA-NV	(775) 687-1231
D. Keith Maki	Nevada DOT	(775) 888-7446

ARDEN CORRIDOR INVESTMENT

Description: This project is one of two FY 2002 ITS Integration Program earmarks for the City and County of Sacramento, CA. The project implements interconnection of the Traffic Operations Centers in the City and County of Sacramento along the Arden Way Corridor. The communication connectivity will provide for data sharing and the exercise of control between City and County assets. The design concept is that ITS infrastructure to be deployed in subsequent phases of this project will be accessible and controllable by both jurisdictions. Funding for this project also provides for a regional Strategic Deployment Plan to guide future ITS deployment/integration projects.

Project Location: City and County of Sacramento, CA

Partner(s): FHWA, Sacramento Area Council of Governments, City of Sacramento

Start Date: September 2002

***End Date*:** August 2004

Estimated Total ITS Funds: $976,555

Estimated Total Project Cost: $1,953,910

***Contacts*:**

Frank Cechini	FHWA California Division, HDA-CA	(916) 498-5005
Angie Louie Fong	City of Sacramento Public Works Dept.	(916) 264-7921

ATLANTA, GEORGIA ITS COMPONENT INTEGRATION - PHASE I

Description:

This project integrates transit and public safety components with other transportation management or real-time, multi-modal traveler information systems through an implementation of center-to-center communications protocol. The project proposes to evaluate Common Object Request Broker Architecture (CORBA) as the preferred interface between centers.

In metropolitan areas, TEA-21 states that ITS Integration funding shall be used primarily for activities necessary to integrate intelligent transportation infrastructure elements that are either already deployed, or will be deployed with other sources of funds. The project is an extension of the significant investment that all involved agencies have made in ITS deployment. Funded as a FY 99 earmark, initial stages of project activity began in January 2000.

Project Location: Atlanta, Georgia

Partner(s): Georgia DOT; City of Atlanta; Metropolitan Atlanta Rapid Transit Authority

Start Date: September 1999

End Date: January 2003

Estimated Total ITS Funds: $1,582,939

Estimated Total Project Cost: $3,172,878

Contacts:

Mshadoni Smith	FHWA Georgia Division, HDA-GA	(404) 562-3638
Carla Holmes	Georgia DOT	(404) 635-8014

AUSTIN, TEXAS

Description:

This project is the FY 2002 ITS Integration Program earmark for Austin, Texas. The project will integrate motion video image information between the City of Austin's Computerized Traffic Signal System and the TXDOT Freeway Corridor Traffic Management System. Each agency independently operates a portion of a regional ITS which includes a significant number of closed circuit television camera/locations. Integration of these cameras will provide sharing of motion video between the agencies. This expanded coverage will improve traffic management and incident management in each agency's area of responsibility. Improved incident response times are expected to facilitate incident clearance, thereby enabling signal-timing adjustment in order to accommodate increased traffic on service roads.

The exchange of motion video and traffic flow data between the City of Austin and TxDOT builds on a FY 2000 ITS Integration Program project which developed a regional ITS architecture. The initial activity under this architecture was the integration of the City of Austin's emergency services computer-aided dispatch and signal system with TxDOT's Advanced Traffic Management System.

Project Location: Austin, Texas

Partner(s): FHWA, Texas DOT, City of Austin Department of Public Works

Start Date: September 2002

***End Date*:** September 2003

Estimated Total ITS Funds: $103,415

Estimated Total Project Cost: $206,830

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
David Gerard	Austin Dept. of Public Works	(512) 974-7022

BALTIMORE REGIONAL OPERATIONS COORDINATION PROJECT

Description:

This project is a component of the State of Maryland FY 2000 ITS Integration Program earmark. The purpose of this project is integration between operations - between transportation and public safety, between jurisdictions and the state, between transit and roadway, and between highway and arterial. The Regional Operations Coordination project will have two phases: Phase 1: Planning; and Phase 2: Deployment. Most of the funds requested by this project will be used for Phase 1 tasks. However, several Coordination Activities have been identified in the area of Incident Management, and these activities will be deployed concurrent with Phase 1 tasks.

Phase 1 generally involves developing a logical and physical architecture for regional operations and identifying Coordination Activities that would enhance regional coordination. Phase 1 tasks will include: defining goals, objectives, and operational requirements and concepts; defining system functional requirements; compiling existing systems and operations information; developing logical and physical architectures; and identifying Coordination Activities.

Phase 2 will involve deployment of selected Coordination Activities. In studies performed as part of the Baltimore Metropolitan ITS Early Deployment Plan, Incident Management arose as a high priority for the region. A primary activity identified to improve Incident Management is the establishment of a Multi-Disciplined Incident Management Team that meets regularly to discuss issues and improve coordination. A small portion of the funds requested through this application will be used to support this and other Coordination Activities identified through recent regional Incident Management activities.

Project Location: Baltimore, Maryland

Partner(s): FHWA; MD State Highway Administration; MD Transportation Authority; MD Aviation Administration; MD Port Administration; Mass Transit Administration; MD State Police; MD Emergency Management Administration; U.S. Park Police; Departments of Public Works and Police in Cities of Balitmore and Annapolis, and Counties of Ann Arundel, Carroll, Harford, Howard

Start Date: September 2000

***End Date*:** December 2008

Estimated Total ITS Funds: $160,000

Estimated Total Project Cost: $320,000

***Contacts*:**

Breck Jeffers	FHWA Maryland Division, HPT-MD	(410) 962-4342	Ext. 129
Mike Zezeski	Maryland SHA	(410) 787-5605	
Eileen Singleton	Baltimore Metropolitan Council	(410) 732-0500	Ext. 1033

BELLINGHAM REGIONAL OPERATIONS CENTER

Description:

This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The project will establish a Transportation Management Center (TMC) in Bellingham, WA to facilitate integration of closed circuit TV, highway advisory radio (HAR), dynamic message signs (DMS) either already deployed or in the process of being deployed. The integration of ITS elements in the Bellingham TMC will result in delivery of the following service enhancements:

- Collection of traffic data and presentation of flow conditions on the Internet.
- Posting of border crossing information.
- Presentation of full motion video clips for the existing cameras.
- Remote access to DMS and HAR to disseminate traffic information.
- Incident detection and management.

Project Location: Bellingham, Washington

Partner(s): FHWA, Washington State DOT; Washington State Patrol, City of Bellingham

Start Date: September 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $413,659

Estimated Total Project Cost: $827,300

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Vinh Dang	WSDOT	(206) 440-4462

BRANSON TRIP/SPRINGFIELD DISCOVERY REGIONAL INTERCONNECT

Description:

This FY 2000 earmarked project builds on a successful field operational test initiated in 1996. The Branson TRIP (Travel and Recreational Information Program) project deployed an advanced traveler information system which provided up-to-date traffic, weather and other travel-related information to visitors in the Branson, MO area. The primary means of information dissemination were variable message signs, Highway Advisory Radio, Kiosks, Websites and Interactive Voice Response Systems.

Concurrently with the development of Branson TRIP, Springfield and the Missouri Department of Transportation developed the traffic signal management system housed in the Springfield Discovery Center. This project has several state of the art cameras that monitor major intersections within the Springfield Metro area. Traffic engineers utilize the cameras to monitor traffic flows, thus determining timing for area signals to provide free flowing traffic with as little start/stop delays as possible, maximizing the efficiency of vehicle travel times within the City of Springfield.

The objective of this FY 2000 earmark is to connect the Branson and Springfield travel management infrastructure. This integration will enable enhanced traffic management and information sharing over an expanded geographic region, thus providing alternative route selection to drivers 40 to 50 miles before reaching their destinations.

Project Location: Branson/Springfield, Missouri Region

Partner(s): FHWA, Missouri DOT, City of Springfield, City of Branson

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $1,573,421

***Contacts*:**

Bob Thomas	FHWA Missouri Division, HDA-MO	(573) 636-7104
Matthew Seiler	Missouri DOT	(417) 895-7627
Laurel McKean	Missouri DOT	(417) 895-7635

BRANSON/SPRINGFIELD REGIONAL INTELLIGENT TRANSPORTATION SYSTEM

Description:

This project is the FY 2001 ITS Integration Program earmark for Springfield-Branson, Missouri. The project builds on the FY 2000 earmark, Branson TRIP/Springfield Discovery Regional Interconnect.

The existing Springfield/Branson Regional system operates as several independent components. These include traffic signal management, Branson TRIP (traveler and information program), emergency response and emergency management proprietary systems, City of Springfield transit management system, and the multi-modal database developed by the regional airport. The Branson TRIP and traffic signal management components are currently being integrated as part of Phase II of the regional system.

Software deployed at the TMC and the associated communications system will enable the integration of these systems into a central location. A centralized system will enhance coordination efforts of traffic congestion management, incident response and traveler information dissemination in the region. Existing systems will be connected into the TMC to assure that notification of incidents and congestion can be easily verified and shared with all users. The system will be expandable and support future development and additional components into the future.

Once the software has been developed, the appropriate field equipment will be deployed. Expected equipment includes dynamic message signs located along major arterials, surveillance cameras for incident verification, highway advisory radio for traveler information, and traffic detectors to collect traffic data for congestion notification.

Project Location: Springfield-Branson, Missouri

Partner(s): FHWA, FTA, Missouri DOT, Cities of Springfield and Branson

Start Date: September 2001

***End Date*:** March 2004

Estimated Total ITS Funds: $595,211

Estimated Total Project Cost: $1,190,422

***Contacts*:**

Bob Thomas	FHWA Missouri Division, HDA-MO	(573) 636-7104
Bill Kalt	FTA Region 7	(816) 329-3927
Matthew Seiler	Missouri DOT	(417) 895-7627

CAPITAL WIRELESS INTEGRATED NETWORK (CapWIN)

Description: This project will implement a wireless communications network that serves the core mobile communication functional needs of transportation, law enforcement, fire and EMS in the Washington Metropolitan Region. The network will support multiple in-vehicle platforms. In the second year of the project, transportation and public agency systems and databases will be integrated with a 30-vehicle fleet on the network using multiple mobile data platforms. Vehicles will include State and local police vehicles, service patrols, fire and EMS units.

Project Location: Washington, DC Metropolitan Area

Partner(s): FHWA, Maryland State Highway Administration, Virginia DOT, Maryland State Police, Virginia State Police, Washington Metro Police Department

Start Date: September 2000

***End Date*:** December 2003

Estimated Total ITS Funds: $1,600,000

Estimated Total Project Cost: $3,932,105

***Contacts*:**

Breck Jeffers	FHWA Maryland Division, HPT-MD	(410) 962-4342	Ext. 129
Mike Zezeski	Maryland SHA	(410) 787-5605	
Jim Robinson	Virginia DOT	(804) 786-6677	
Tom Jacobs	University of Maryland	(301) 403-4594	

CHARLOTTE ITS INTEGRATION

Description: This project constitutes the FY 2000 ITS Integration Program earmark for Charlotte, North Carolina. This project's objective is to improve information sharing among key transportation management facilities in the Charlotte-Mecklenburg region. The NCDOT Metroliner Transportation Management Center, the Charlotte DOT (CDOT) Signal Traffic Operations Center, and the CDOT Transit Center will be interconnected. In addition, the US 74 High Occupancy Vehicle (HOV) System and the US 29 Reversible Lane System will be connected to the Metroliner TMC. The final portion of this project will interconnect the Tyvola Road Reversible Lane System to the CDOT Signal System Traffic Operations Center. This integration project will connect various systems to city and state traffic operations centers and lay the basis for increased cooperation between the NCDOT and the City of Charlotte.

Project Location: Charlotte, NC

Partner(s): FHWA, North Carolina DOT, Charlotte DOT

Start Date: May 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $1,572,842

***Contacts*:**

Max Tate	FHWA North Carolina Division, HDA-NC	(919) 856-4354
Ann Lorscheider	North Carolina DOT	(919) 250-4151

CITY OF SUPERIOR AND DOUGLAS COUNTY, WISCONSIN

Description:

This project is the FY 2000 ITS Integration Program earmark for the City of Superior and Douglas County, WI. Funding in the amount of $236,000 (from $786,421 available) was approved in September 2002. The project is comprised of three separate activities, all of which have periods of performance within the timeframe identified below. Individual sub-project activities are summarized in the following narratives.

Sub-project #1. City of Superior and Douglas County, WI Scoping Study - This project is a study whose objective is to identify the necessary ITS projects for the City of Superior and Douglas County. It will outline top level, general descriptions of projects in the City of Superior that will interconnect the Superior-Duluth, MN ITS elements in an integrated operating system. Emphasis will be on weather information and integrated traffic operations across the St. Louis Bay bridges between Superior and Duluth. This project's total estimated cost is $100,000, $50,000 of which is from the earmark.

Sub-project #2. Superior's Integration Software - This project will support software and communications connectivity between Superior and the Duluth, MN Traffic Management System. Wisconsin DOT will procure the software applications currently used by MNDOT in the Duluth Traffic Management System. This software integration initiative lays the basis for monitoring and coordinating several ITS elements to include: interstate traffic monitoring; WISDOT and MNDOT data exchange; weather information sharing; arterial traffic monitoring; and monitoring of arterial dynamic message signs. The total estimated cost for this project is $262,000 of which $131,000 consists of earmarked funding.

Sub-project #3. Evaluation of the Superior/Douglas County Earmark Implementation Projects - This activity will consist of a self-administered evaluation of the projects identified above. The evaluator will feature benefits assessments and cost effectiveness analyses. The total estimated cost of the evaluation is $110,000 of which $55,000 is from earmarked funding. This evaluation activity will be completed eighteen months after the deployment projects.

Project Location: City of Superior and Douglas County, Wisconsin

Partner(s): FHWA; Wisconsin DOT; Minnesota DOT; Wisconsin State Patrol; Douglas County, WI; City of Superior, WI; City of Duluth, MN

Start Date: September 2002

***End Date*:** July 2004

Estimated Total ITS Funds: $236,000

Estimated Total Project Cost: $472,000

***Contacts*:**

John Berg	FHWA Wisconsin Division, HDA-WI	(608) 829-7515
Phil De Cabooter	Wisconsin DOT	(608) 267-0452

COLORADO I-25 TRUCK SAFETY IMPROVEMENTS

Description: This project is to fund the integration of ITS components in the Denver Metropolitan Area and along the interstates serving the greater Denver area. Included in the project will be the expansion and integration of the Colorado DOT and City of Colorado Springs traffic operations centers, and enhancements to incident management. This is part of a long-term, statewide, advanced transportation management and traveler information system - Colorado Transportation Management System (CTMS) contract. It is envisioned as a statewide multi-agency ITS network created to enhance Colorado surface transportation through the integration of existing and planned management, information, communications, and control systems; incorporating traveler information systems, traffic management systems, public transportation systems, commercial vehicle operations (CVO), and other local, regional and statewide initiatives.

Project Location: Colorado

Partner(s): Colorado DOT

Start Date: October 1998

***End Date*:** February 2003

Estimated Total ITS Funds: $9,000,000

Estimated Total Project Cost: $11,250,000

***Contacts*:**

Scott Sands	FHWA Colorado Division, HFO-CO	(303) 969-6730	Ext. 362
John Nelson	Colorado DOT	(303) 512-5838	

COMMONWEALTH OF PENNSYLVANIA

Description:

The two projects described under this title comprise the Commonwealth of Pennsylvania FY 1999 Earmark which was carried over to FY 2000. The two projects are identified as Penn DOT-US Route 202 and Pennsylvania Turnpike. The funding amounts listed below are broken down as follows: Penn DOT (US Rt. 202); earmarked funds - $2,021,243 and total estimated cost - $10,500,000; Pennsylvania Turnpike, earmarked funds - $3,169,044 and total estimated cost - $6,338,088.

The Penn DOT (US Rt. 202) project is focused on providing ITS applications to the US Route 202 corridor under renovation near King of Prussia, PA. The project will deploy ITS infrastructure to improve incident management, traveler information and emergency services in a congested section of Philadelphia. The major components of metropolitan ITS infrastructure scheduled for deployment include:

- Variable Message Signs (12 permanent, 4 portable).
- Closed Circuit TV (46 cameras proposed).
- Automatic Incident Detection System, connected to a Traffic Control Center via fibre optic network.
- Integration of systems with a Traffic Control Center via a fibre optic network.

Project duration is estimated at 25 months.

The Pennsylvania Turnpike component of the earmark is dedicated to expand an advanced traveler information system. The project will expand existing capabilities by providing for Traffic Flow Monitoring using electronic toll tag systems, installation of Closed Circuit TV, and deployment of roadway weather information stations to enhance weather and surface monitoring capabilities.

Project duration is estimated at 12 months per subsystem (Traffic Flow Detection, Closed Circuit TV, and Roadway Weather Information).

Project Location: Diverse locations in Pennsylvania

Partner(s): FHWA, Penn DOT, PA Turnpike Commission, PA Emergency Management Agency, PA Dept. of Environmental Protection, PA Motor Truck Association

Start Date: September 2000

***End Date*:** July 2004

Estimated Total ITS Funds: $5,190,287

Estimated Total Project Cost: $16,838,088

***Contacts*:**

Carmine Fiscina	Philadelphia FHWA Metro Office, PMO-PA	(215) 656-7111
Rex MacKey	PennDOT	(610) 205-6675

COMMUTERLINK

Description:

This project originated with the FY 2000 ITS Integration Program earmark for Salt Lake City, Utah. The project will consist of the deployment, and enhancement of a variety of subsystems to integrate traffic management, transit management, emergency management and traveler information systems. These initiatives continue the integration and enhancement of the CommuterLink system of ITS deployments whose original long-term goals were to improve traffic flow and reduce emissions on the State highway system in the Salt Lake Valley. CommuterLink enhancements currently planned are intended to be in place by the 2002 Winter Olympic Games. This project's activities focus on a wide range of system enhancements partially illustrated by the following examples:

- Systems Graphics Map providing real-time displays.

- Ramp Metering Subsystem on I-15.

- Website Enhancements for traveler information.

- Traveler Advisory Telephone providing recordings of real-time conditions.

- Integration of mobile systems on incident management vehicles.

There are a total of twenty discreet system upgrades planned for CommuterLink in this project. Each is designed to provide additional capabilities for managing Olympic-related traffic as well as establishing a basis for long-term, integrated transportation management in the Salt Lake Urbanized Area.

The FY 2001 ITS Integration Program earmark for the Salt Lake City Urbanized Area builds on the FY 2000 earmarked CommuterLink project. This earmark will develop the following system enhancements:

- Commercial Vehicle Information System and Networks (CVISN) development toward Level 1 capabilities will continue. Utah will join Washington, Oregon, and Idaho in building a regional CVIEW database. Fuel tax, vehicle registration and overweight/oversize permitting systems will be linked to a regional CVIEW capability and Port of Entry agents will be trained to provide enhanced service and increased efficiency to motor carriers.

- Field Deployment and Expansion of the CommuterLink advanced traffic management system will include addition of new field devices, increased integration of existing devices to include closed circuit TV, congestion detectors and highway advisory radio.

- Integration of newly deployed subsystems into CommuterLink and the web site providing access to all capabilities.

- An evaluation activity will be conducted following deployment of various subsystems and components deployed during the timeframe of this earmark.

Project Location:

Salt Lake Urbanized Area

Partner(s):

FHWA; FTA; Utah DOT; Utah Transit Authority; Salt Lake County; Wasatch Front Regional Council; Mountainland Association of Governments, Salt Lake Organizing Committee; Cities of South Salt Lake, Draper, Taylorsville, Sandy City, Midvale, Murray City, West Jordan; University of Utah

Start Date:

June 2000

End Date:

March 2003

Estimated Total ITS Funds: $3,549,685

Estimated Total Project Cost: $19,709,263

Contacts:

Russell Robertson	FHWA Utah Division, HPM-UT	(801) 963-0078	Ext. 229
Martin Knopp	Utah DOT	(801) 965-4894	

CORPUS CHRISTI, TEXAS, INTEGRATION OF INTELLIGENT TRANSPORTATION SYSTEMS

Description:

This project proposes to develop a Corpus Christi Regional ITS Architecture and Deployment Plan. It also proposes to establish the base for an Intelligent Transportation System in the Corpus Christi Metropolitan Area. The project will expand or implement traffic signal, freeway, emergency, transit, and special event management capabilities. The system will implement a mesh network topology with decentralized operations. Plans are to involve all agencies involved in transportation and/or incident management.

Specific areas of focus for the project once the Regional ITS Architecture is developed, are the establishment of a fibre-based communication backbone and the expansion of the existing fibre network integrating other key operating agencies such as the Regional Transportation Authority; City of Corpus Christi Police Department; Fire Department, Street Department; Department of Public Safety and the Regional Terminal Fire Company; and establishment of a Traveler Information System on regional freeways. Major elements will be dynamic message signs, highway advisory radios and surveillance cameras.

Project Location: Corpus Christi, Texas

Partner(s): Texas DOT, Corpus Christi District; Texas Department of Safety; Texas DOT Traffic Operations Division; Nueces County, County of Nueces Emergency Management; City of Corpus Christi; City of Corpus Christi Emergency Mgt., MPO, Police Dept; Local Emergency Planning Committee; Regional Transportation Authority

Start Date: November 1999

***End Date*:** December 2003

Estimated Total ITS Funds: $712,323

Estimated Total Project Cost: $1,425,000

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Ismael Soto	Texas DOT (Corpus Christi District)	(361) 808-2225
Janie Light	Texas DOT, TRF-TM	(512) 416-3258

DEL RIO, TEXAS INTEGRATION OF INTELLIGENT TRANSPORTATION SYSTEMS

Description:

This project will develop an ITS Regional Architecture and ITS Deployment Plan for the Del Rio area which allows for maximizing integration of ITS infrastructure. The plan will provide the outline of the phasing of tasks including, but not limited to the following:

- Establishment of a local point of ITS data centralization and two-way communication capabilities between a local transportation management center (TMC) with the TransGateway TMC in Laredo, Texas.

- Strategic upgrades to TransGateway to facilitate regional integration between Del Rio and TransGateway.

- Implementation of integration strategies focused on incident management-particularly remote flood-sensing and signal preemption applications, and commercial vehicle operations.

Project Location: Del Rio, Texas

Partner(s): Texas DOT; Dept. of Treasury; U.S. Border Patrol; Val Verde County; Del Rio Chamber of Commerce Transportation; City of Del Rio

Start Date: December 1999

***End Date*:** January 2004

Estimated Total ITS Funds: $791,470

Estimated Total Project Cost: $1,580,000

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Robert Rodriguez	TxDOT (Laredo District) Transportation Operations	(956) 712-7485
Bernie Walker	Traffic Operations - TM	(512) 416-3437

DELAWARE RIVER, PENNSYLVANIA

Description:

This project is the Delaware River, PA FY 2000 Earmark. The project was also earmarked in FY 1999, but carried over to FY 2000. Earmarked funding obligated in FY 2000 includes the $791,000 FY 1999 earmarked amount in addition to the FY 2000 earmark in the amount of $786,421. The project is a component of the Delaware River Port Authority's (DRPA) SmartBridges Program. SmartBridges refers to a group of advanced technology applications intended to improve DRPA operations. The program includes electronic toll collection and the integration of several ITS infrastructure systems with a centralized Traffic Operations Center (TOC). This TOC will integrate police vehicle dispatch, in-vehicle computer systems, traffic and facility video surveillance, environmental monitoring and other advanced communications functions in one centralized facility. The goal is to leverage ITS technologies to streamline information flow through a centralized mode to reduce traffic congestion and increase throughput.

This TOC will integrate many of the SmartBridges applications into one system, and will provide integrated, real-time data to support operations management and real-time decision making. It is at the TOC where DRPA traffic and incidents will be appropriately monitored and controlled. In cases of traffic flow changes, accidents or other roadway incidents, DRPA Public Safety Department officers will be quickly informed and dispatched.

Major elements of the SmartBridges TOC include:

- Closed Circuit TV Cameras for Traffic Surveillance.
- Variable Message Signage.
- Lane Signal Control.
- Remote Computer Aided Dispatch.
- Facility Security.
- Enhanced Highway Advisory Radio.
- Regional Interface with the I-95 Corridor Coalition and Other Public Agencies.

Project Location: Delaware River, Pennsylvania

Partner(s): FHWA, Pennsylvania DOT, Delaware River Port Authority, Delaware Valley Regional Planning Commission

Start Date: April 2000

***End Date*:** December 2004

Estimated Total ITS Funds: $1,577,421

Estimated Total Project Cost: $3,154,842

***Contacts*:**

Carmine Fiscina	Philadelphia FHWA Metro Office, PMO-PA	(215) 656-7111
Linda Hayes	DRPA	(856) 968-2210

DURHAM AND WAKE COUNTIES, NORTH CAROLINA

Description: This project is the FY 2002 ITS Integration Program earmark for Durham and Wake Counties, North Carolina. The project will install fiber optic communications, integration software and multiplexing equipment between the NCDOT Regional Transportation Management System and the Wake/Durham Counties Public Safety Systems. Building on a FY 2001 earmark which funded communications interconnects designed to enable data and information sharing between systems the project establishes the required communication links to implement an architecturally compliant system therefore eliminating the deployment of redundant communications systems.

Project Location: Durham and Wake Counties, NC

Partner(s): FHWA, North Carolina DOT

Start Date: September 2002

***End Date*:** December 2004

Estimated Total ITS Funds: $413,659

Estimated Total Project Cost: $1,013,659

***Contacts*:**

Max Tate	FHWA North Carolina Division, HDA-NC	(919) 856-4354	Ext. 125
James Dunlop	North Carolina DOT	(919) 250-4151	

FLORIDA BAY COUNTY

Description:

This project originated as the FY 2000 ITS Integration Program earmark for Florida Bay County, Florida. It initiated a multi-phased project to design and deploy a fiber optic communications backbone to serve as the basic integration means for follow-on deployments of ITS infrastructure. A regional ITS architecture was completed in April 2001, and established the framework for arterial management systems enhancement and integration with the incident management system during the Hathaway Bridge Replacement Project. The FY 2001 ITS Integration Program earmark built on the initial project by expanding the deployment of infrastructure integrated by the backbone. Expanded integration focused on incident management capabilities and an advanced traffic management system. A FY 2002 ITS Integration Program earmark continues to expand project activity initiated by FY 2000 and 2001 funding. The FY 2002 earmark consists of two phases:

- Design and installation of a fiber optic network in the Bay County area.

- Design and upgrade of the Hathaway Bridge Incident Management System in conjunction with the Hathaway Bridge Replacement Project.

The funding amounts listed below under "Estimated Total ITS Funds" include allocations for fiscal years 2000 through 2002. The completion date reflects schedule adjustments accommodating added FY 2002 funding.

Project Location: Panama City, Florida

Partner(s): Florida DOT, Bay County Traffic Engineering, City of Panama City Traffic Emergency, Florida Highway Patrol, Bay County Emergency Services, Bay District Schools

Start Date: June 2000

***End Date*:** November 2005

Estimated Total ITS Funds: $2,390,502

Estimated Total Project Cost: $5,749,831

***Contacts*:**

Chung Tran	FHWA Florida Division, HDA-FL	(850) 942-9650	Ext. 3041
Cliff Johnson	Florida DOT	(850) 638-1250	Ext. 694

FORSYTH/GUILFORD COUNTIES, NORTH CAROLINA

Description: This project is the FY 2002 ITS Integration Program earmark for Forsyth and Guilford Counties North Carolina. The project will combine two operational Transportation Management Centers (TMCs) in Greensboro and Winston-Salem into one TRIAD (Piedmont TRIAD region - Winston-Salem, Greensboro, High Point, and Burlington) Regional TMC. Independent systems in these TMCs will be integrated to provide significantly improved information sharing between the North Carolina DOT, the City of Greensboro's system, the City of Winston-Salem's Traffic Operations Center and the Winston-Salem situation room. Additionally, the integrated systems will enable Greensboro and Winston-Salem to monitor visually traffic flow on the interstate systems, and adjust signal systems to improve traffic operations when freeway traffic is diverted to these adjacent arterials.

Project Location: I-85/I-40 Corridor

Partner(s): FHWA, North Carolina DOT, City of Greensboro DOT, City of Winston-Salem DOT

Start Date: September 2002

***End Date*:** December 2004

Estimated Total ITS Funds: $827,318

Estimated Total Project Cost: $3,627,318

***Contacts*:**

Max Tate	FHWA North Carolina Division, HDA-NC	(919) 856-4354
James Dunlop	North Carolina DOT	(919) 250-4151

GREAT LAKES ITS (GLITS) PROGRAM - PHASE I

Description:

This project comprises three of four FY 2001 ITS Integration Program earmarks for the State of Michigan. Congressional designations for Oakland and Wayne County, Southeast Michigan, and Wayne County, Michigan are incorporated in this project. The project is situated in the Great Lakes International Economic Corridor which comprises all of southeast Michigan from Toledo, OH to Flint, MI. Long-term project goals include providing travelers throughout the corridor with information to improve commutes, and expedite just-in-time delivery. Commerce with Canada will be facilitated and traveler safety will be enhanced through ITS deployments. The Great Lakes ITS Program will achieve these goals through multi-phased deployment and integration of ITS projects. The Michigan Department of Transportation (MDOT) will lead development and management of this multi-phase, multi-jurisdictional program. The first phase includes the following tasks:

- Completion of the regional ITS architecture to support the integration plans of the region.
- The continued development of the Road Information Management System (RIMS) for Wayne County, Michigan.
- Integration of ITS and public transportation operations at the Detroit/Wayne County Metropolitan Airport with area-wide transportation operations.
- Development of an integration plan and deployment of an area-wide traffic and incident management system in the I-75 corridor.
- Development of an integration plan for intermodal operations on Woodward Avenue in Detroit.
- Development of plans for an ITS "testbed" in the corridor.

Project Location: Southeast Michigan

Partner(s): FHWA, Michigan DOT, Southeast Michigan COG, Wayne County, Detroit Metropolitan Wayne County Airport, Road Commission for Oakland County, Detroit DOT, Suburban Mobility Authority for Regional Transportation

Start Date: September 2001

***End Date*:** September 2004

Estimated Total ITS Funds: $5,555,302

Estimated Total Project Cost: $11,110,604

***Contacts*:**

Morris Hoevel	FHWA Michigan Division, HDA-MI	(517) 702-1834
Jim Schultz	Michigan DOT	(313) 256-9800

HAMMOND, LOUISIANA

Description: This project is the FY 1999 ITS Integration Program earmark for Hammond, LA. Federal ITS funding was carried over to FY 2000 and was obligated in September 2000. This is a multi work order project which seeks to design and integrate a Roadway Weather Information System (RWIS) and an Incident Detection, Verification and Response System. The project is part of an ongoing endeavor to develop a fully integrated Advanced Traffic Management System and Advanced Traveler Information System for the Greater New Orleans Region. The ITS infrastructure will include components for Data Collections, Traveler Information, Video Surveillance and Interagency Communications. The infrastructure components to be integrated include Freeway Management, Incident Management, Emergency Services Management, and Regional Traveler Information Services.

Project Location: Hammond, Louisiana

Partner(s): FHWA, Louisiana Department of Transportation and Development, New Orleans Area Regional Planning Commission, Louisiana State Police, Greater New Orleans Expressway Commission, local metro area law enforcement agencies

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $3,166,000

Estimated Total Project Cost: $6,331,756

***Contacts*:**

John Broemmelsiek	FHWA Louisiana Division, HDA-LA	(225) 757-7614
Steve Glascock	Lousiana State DOT	(225) 935-0130

HATTIESBURG, MISSISSIPPI ITS PROJECT

Description: This project is the FY 2001 ITS Integration Program earmark for the City of Hattiesburg, MS. Project objectives include integrating the City's Traffic Management Center with the Mississippi DOT control center and freeway management infrastructure elements. The project will be implemented in ten phases, with the first two phases being included in the FY 2001 increment. Phase 1 includes integration of seven signalized intersections, while phase 2 will incorporate signal upgrades to be accomplished by MS DOT. The project will integrate the improved Traffic Signal Control System with Incident Management and Emergency Services Management Systems by providing means to exchange information and manage traffic more efficiently. The upgraded Traffic Management Center is to be integrated with traffic signal locations, video detection devices, and emergency vehicle priority control systems.

Project Location: Hattiesburg, Mississippi

Partner(s): FHWA, Mississippi DOT, City of Hattiesburg

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $396,807

Estimated Total Project Cost: $795,364

Contacts:

Mike Cribb	FHWA Mississippi Division, HDA-MS	(601) 965-4228
Scott Carson	FHWA Mississippi Division, HDA-MS	(601) 965-4232
Bob Mabry	Mississippi DOT	(601) 359-1454
Jeff Smith	City of Hattiesburg	(601) 545-4541

HIGHWAY PERFORMANCE MONITORING

Description: This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. Washington State DOT (WSDOT) currently operates an active Archived Data User Service activity. The system collects freeway operations data, generates an archive, and then analyzes the archived data to produce a large number of key performance measures used by WSDOT and other transportation agencies. This project will expand the scope and capabilities of the data archiving activity in two areas. The system will be upgraded to fuse other roadway performance data sources in order to expand the geographic scope of the system and the types of performance measures the system can report. A complementary effort will make the archive Web accessible so that users outside the WSDOT staff can access performance reports through the Internet. The project objective is to develop a database supporting the collection of diverse data at a central location, converting these data into consistent, useful statistics, and providing a mechanism for analyzing and reporting performance statistics.

Project Location: Washington State

Partner(s): FHWA, Washington State DOT, Washington State Transportation Center (TRAC)

Start Date: September 2002

***End Date*:** August 2004

Estimated Total ITS Funds: $206,825

Estimated Total Project Cost: $413,650

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Mark Hallenbeck	TRAC	(206) 543-6261

HOUMA URBANIZED AREA INTELLIGENT TRANSPORTATION/INCIDENT MANAGEMENT SYSTEM

Description:

This project is the FY 2000 ITS Integration Program earmark for Houma, Louisiana. Funding for the project was approved in FY 2002. The project objective is the integration of infrastructure used by public agencies involved in transportation management and incident management in the Houma Urbanized region to improve safety through information exchange and the joint development of regional transportation systems.

Project phasing begins with the development of a Regional ITS Architecture as part of a Regional Incident Management Strategic Implementation Plan. Following phases include development and implementation of a reliable communication network to connect incident management agencies and their existing systems to facilitate information exchange. This wide area network will utilize a fiber optic network to create the communications backbone required to integrate incident management agencies, and lay the basis for future ITS initiatives. The final phase will consist of an evaluation of benefits derived from the integration.

Project Location: Houma, Louisiana

Partner(s): FHWA; FTA; Louisiana Department of Transporation and Development (LADOTD); Terrebonne Parish Consolidated Government; Louisiana State Police; Bayou Cane Volunteer Fire Department; Schriever Volunteer Fire Department

Start Date: September 2002

***End Date*:** March 2004

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $2,000,000

***Contacts*:**

John Broemmelsiek	FHWA Louisiana Division, HDA-LA	(225) 757-7614
Stephen Glascock	LADOTD	(225) 935-0130

I-25 SOUTHEAST CORRIDOR AND COLORADO TRANSPORTATION MANAGEMENT SYSTEM (CTMS) INTEGRATION ACTIVITIES

Description:

This project constitutes a combination of two FY 2000 Integration Earmarks. Arapahoe County, CO, funded at $786,421, and Jefferson County, CO, funded at $1,179,632. The Arapahoe County earmark will provide improvements to the I-25 corridor from south Denver through the Denver Technological Center (DTC) in the southern suburbs, the most heavily traveled segment of interstate highway in Colorado. ITS planning activities for that project are in progress as Colorado DOT (CDOT) realizes that active ITS measures will be required to operate and manage the corridor over the required eight to ten year construction period.

Integration activities undertaken herein will allow a jump-start of the Southeast Corridor ITS deployment plan, such that CDOT is better positioned to successfully operate, manage and maintain I-25 when construction starts in earnest. Early integration will allow corridor agencies to share information, manage incidents, pool surveillance data, and determine efficient methodologies to disseminate travel information to the public. Simply stated, the funding for this project will be used to help mitigate the impact of the Southeast Corridor work.

The Jefferson County component of the project will be addressed as follows. As part of the Colorado Traffic Management System (CTMS), CDOT is working toward a Center-to-Center (C2C) interface with the City of Lakewood. Additional CTMS activities include development of a low-speed ITS communications architecture intended for deployment activities; and enhancing or providing better internal integration for the following subsystems: weather; "central" CCTV; automated traffic recorder (ATR); highway advisory radio (HAR); variable message signs (VMS); and enhancing CDOT's kiosk and Internet information dissemination subsystems. As the CTMC and Lakewood are within Jefferson County, CDOT will use a second component of the project funding to accelerate the referenced integration activities (including the Lakewood interface) as well as develop initial planning for additional Jefferson County C2C interfaces.

The combined project will, therefore, provide integration between CDOT, cities and counties; and will primarily comprise the integration of traffic signal control, freeway management, and incident management functional areas. This effort is part of an ongoing implementation and integration program for ITS elements in the Denver area and the entire state of Colorado. This project will build upon previous efforts and parallel initiatives, and will move forward with the integration of additional systems. The primary focus of this project will be the integration of county and city traffic, emergency and transit management centers in the Denver area in advance of the Southeast Corridor project.

Project Location: Lakewood, Colorado

Partner(s): FHWA; Colorado DOT; Denver Regional Council of Governments; Denver International Airport; Counties of Arapahoe, Denver, Jefferson, Douglas; Cites of Aurora, Colorado Springs, Denver, Englewood, Greenwood Village, Littleton

Start Date: September 2000

***End Date*:** May 2003

Estimated Total ITS Funds: $1,966,053

Estimated Total Project Cost: $4,466,053

Contacts:

Scott Sands	FHWA Colorado Division, HFO-CO	(303) 969-6730
John Nelson	Colorado DOT	(303) 512-5838

I-76 SCHUYLKILL EXPRESSWAY CORRIDOR ITS PROJECT

Description:

This project is a combination of two FY 2001 ITS Program earmarks for Montgomery County and the City of Philadelphia. The project will develop a unified traffic management and signal coordination plan for the Schuylkill Corridor integrating operations across jurisdiction and agency boundaries. The project phasing has designated the first two phases as planning. These phases have been identified to develop a comprehensive, unified systems approach to the entire corridor, as well as means for forming early partnerships. Within established partnerships, each jurisdiction will develop a unified system plan. Based on the success of the first two phases, subsequent deployment initiatives will be programmed.

A transit component of this project managed by the Southeastern Pennsylvania Transportation Authority, will implement a computer-aided radio dispatch system, and install mobile radio equipment in all buses, light rail, and maintenance vehicles. This initiative will be complemented by a pilot Automatic Vehicle Locating System on approximately 80-100 buses.

Project Location: Montgomery County, Pennsylvania, and Philadelphia, Pennsylvania

Partner(s): FHWA; Penn DOT; Delaware Valley Regional Planning Commission; Greater Valley Forge Transportation Management Association; City of Philadelphia; Townships of: Lower Merion, Upper Merion, Whitemarsh, Plymouth; Borroughs of: Norristown, Bridgeport, Conshohocken, West Conshohocken, and Narberth

Start Date: September 2002

***End Date*:** December 2007

Estimated Total ITS Funds: $1,984,036

Estimated Total Project Cost: $3,968,072

***Contacts*:**

Carmine Fiscina	Philadelphia FHWA Metro Office, PMO-PA	(215) 656-7111
Susan Simkus	Montgomery County Planning Commission	(610) 278-3554

I-880/SR 17 SMART CORRIDOR IMPROVEMENTS-SILICON VALLEY, CALIFORNIA

Description:

A Concept of Operations has been developed for the I-880/SR 17 corridor for Santa Clara County through the Silicon Valley Smart Corridor project effort. The I-880/SR 17 corridor extends from the City of Milpitas in the north to the Town of Los Gatos in the south, a corridor having an end-to-end length of about 15 miles. The I-880/SR 17 Smart Corridor Improvements project consists of elements that support integration and information sharing among and across ITS subsystems. One component of this project is to provide an upgrade of the existing data exchange network (DEN) to comply with the National Transportation Communications for ITS Protocol (NTCIP) center-to-center (C2C) communications protocol. This upgrade and others are to be consistent with the national ITS architecture and standards. It is expected that these improvements will facilitate future integrations with transit, future efforts to provide more travel information to the public and portability of the system to system communications software to other jurisdictions both in the County and elsewhere.

The FY 99 Integration Program funding will be used to integrate advanced technologies and real-time system management techniques, including closed circuit television, message signs and coordinated signal timings. This will improve the traffic management capabilities on freeways, arterials and transit operations within the corridor.

Project Location: Santa Clara County, California

Partner(s): Cities of Campbell, San Jose, Milpitas, Santa Clara, Freemont; Santa Clara County; Town of Los Gatos; Santa Clara Valley Transportation Authority (VTA); Caltrans, California Highway Patrol; Alameda County Congestion Management Agency

Start Date: September 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $1,187,204

Estimated Total Project Cost: $4,166,755

***Contacts*:**

Frank Cechini	FHWA California Division, HTC-CA	(916) 498-5005
Casey Emoto	Santa Clara Valley Transportation Authority	(408) 321-5564

INTEGRATE ITS IN VOLUSIA

Description:

This project is the FY 1999 ITS Integration Program earmark for Volusia County, Florida. The project consists of six unique subprojects planned for completion over a two-year period. The component subprojects are known as: Volusia County ITS Architecture; Integration of FDOT, Volusia County and Daytona Beach Video Systems; Dissemination of Video to Other Entities; Internet Web Site; Highway Advisory Radio, and Evaluation. The expected results of these unique, yet integrated projects are: reduced congestion at special/tourist events; improved vehicle routing/diversion; improved access to tourist areas and tourist information; enhanced regional traveler information.

The architecture will allocate transportation system information collection and dissemination resources and agency responsibilities. Integration of FDOT, Volusia and Daytona Beach Video Systems will allow each of the agencies to view the others' cameras. Dissemination of Video to Other Entities will provide video feeds from existing CCTV cameras to federal, state and local entities thereby enhancing dissemination of traffic information. The Internet Web Site will create a database in a single location with traffic, weather and incident information easily accessible by entities at all levels of government. The Highway Advisory Radio subproject will provide significant enhancement of radio coverage to inform visitors about congestion at special events and recommend diversions. The Evaluation subproject will measure public acceptance and utilization of the integrated ITS services.

Project Location: Volusia County, Florida

Partner(s): FHWA, Florida DOT, City of Daytona Beach, Volusia County, Volusia County Transit, Traveler Information Radio Network (TIRN), Daytona Beach Visitors Bureau

Start Date: September 2000

***End Date*:** January 2003

Estimated Total ITS Funds: $791,470

Estimated Total Project Cost: $5,628,740

***Contacts*:**

Chung Tran	FHWA Florida Division, HDA-FL	(850) 942-9650	Ext. 3041
Fred Ferrell	Florida DOT	(386) 943-5309	
Jennifer Heller	Florida DOT	(386) 943-5309	

INTEGRATED TRAFFIC AND INCIDENT MANAGEMENT SYSTEM (PHASE 1) I-74 RECONSTRUCTION PROJECT-ITS ELEMENT

Description:

This project is a component of the FY 2001 ITS Integration Program earmark for the State of Illinois. The project entails a major, three-year reconstruction of approximately 12 miles of Interstate 74 between the cities of Peoria and East Peoria, IL. The project will modernize the section of I-74, and contribute to meeting the transportation needs of the Greater Peoria Area. The project design incorporates deployment of several ITS elements on I-74 and the planned alternate and detour arterials. Key ITS infrastructure includes surveillance cameras, vehicle detection, dynamic message signs, signal system upgrades, emergency vehicle preemption and communications. These components will be complemented by ITS elements to support incident management activities in the I-74 corridor such as patrol vehicle push bumpers, enhanced reference markers, motorist call boxes and emergency telephones.

Integration of deployed systems will be accomplished at IDOT's traffic operations center (TOC) in Peoria. Phase I of the project is focused on installation of computer systems, communications equipment and direct wireless microwave links between the IDOT TOC and partner facilities. Phase II of the project will expand deployments and integration, and develop a traveler information Website.

Project Location: Peoria, IL

Partner(s): FHWA, Illinois DOT, Cities of Peoria and East Peoria Departments of Public Works, City of East Peoria Department of Public Safety

Start Date: April 2002

***End Date*:** December 2004

Estimated Total ITS Funds: $250,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Wendall Meyer	FHWA Illinois Division, HDA-IL	(217) 492-4634
Randy Laninga	IL DOT	(309) 671-4477

INTEGRATION OF ALTERNATE DETECTION COMMUNICATIONS INTO DALTRANS' WIDE AREA COMMUNICATIONS NETWORK

Description: This project, which is a component of the FY 2000 State of Texas Earmark, seeks to coordinate transportation services among the multiple agencies in the greater Dallas, TX area. The primary objective is to integrate services and data sharing among diverse agencies in the 33 incorporated cities in Dallas County to enhance cooperative and coordinated operation of systems. The project will extend existing software and infrastructure development to address additional needs of the project partners. The TXDOT integration effort enables each participating agency to tailor the type, source and frequency of data exchanges to the agency's particular system requirements. In addition to this direct data integration, other agencies in the region will be able to access the DFW Internet Website to enter and obtain major incident information.

Project Location: Dallas, Dallas Co., TX

Partner(s): FHWA; Texas DOT; North Texas Tollway Authority; Dallas Area Rapid Transit; Dallas-Fort Worth International Airport; Shadow/Metro Traffic; Cities of: Dallas; Richardson; Plano; Carrollton; Farmers Branch; Garland; Mesquite; Grand Prairie; Irving; Lewisville

Start Date: September 2000

***End Date*:** December 2003

Estimated Total ITS Funds: $1,966,053

Estimated Total Project Cost: $3,932,106

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Andy Oberlander	Texas DOT	(214) 320-4438

INTEGRATION OF ALTERNATE DETECTION COMMUNICATIONS INTO TRANSVISION'S WIDE AREA COMMUNICATIONS NETWORK

Description:

This project constitutes the FY 2000 ITS Integration Program earmark for Fort Worth, Texas. The project seeks to integrate multiple, existing and newly deployed infrastructure by providing stable and transparent connectivity between systems, thus enabling data and video from one system to appear inherent in other systems. The ultimate end product will be widespread data sharing. TXDOT-Fort Worth District ITS (TransVISION) and the TXDOT-Dallas ITS are developing integration software and infrastructure to enable the multiple participating agencies in the project to access roadway information. The project includes a non-intrusive vehicle detection system expanding the existing coverage area on Tarrant County freeways.

The private sector will be encouraged to participate in TransVISION; both Metro Traffic Networks and Shadow Traffic will be represented in TransVISION to link it with local television and radio stations. Transit management will benefit from integration with TransVISION by having the ability to view the network speed map, and reroute buses around congestion.

Finally, incident information will improve across the region through the link with Emergency Services Management. Traffic Management, Incident Management and Motorist Information systems will receive nearly instantaneous notification of potential problems over a wider geographic area and Emergency Services will receive positive CCTV confirmation of the problem and its exact nature/location, in near real-time.

Project Location: Tarrant County, Fort Worth, Texas

Partner(s): FHWA, Texas DOT, City of Fort Worth, Fort Worth Transportation-Big T, City of Arlington, City of Grand Prairie, Dallas-Fort Worth International Airport, The North Central Texas Council of Governments

Start Date: May 2000

***End Date*:** August 2003

Estimated Total ITS Funds: $1,966,053

Estimated Total Project Cost: $3,932,106

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Abed Abukar	Texas DOT	(817) 370-6621

INTEGRATION OF THE MONTGOMERY COUNTY, MD TRANSPORTATION MANAGEMENT CENTER (TMC) INTO THE EMERGENCY COMMUNICATIONS CENTER (ECC) AND EMERGENCY OPERATIONS CENTER (EOC)

Description: This project is the FY 2002 ITS Integration Program earmark for Montgomery County, Maryland. The project objective is to relocate the Montgomery County Transportation Management Center (TMC) so as to collocate it with the County Emergency Communications Center (ECC) and the Emergency Operations Center (EOC). This consolidation will enable routine operational TMC data to be integrated with the ECC to facilitate incident management throughout the county, and integrated with the EOC to facilitate emergency management.

Project Location: Gaithersburg, Maryland

Partner(s): FHWA, Maryland State Highway Administration, Montgomery County DPWT, Montgomery County Police Department and Fire Department

Start Date: September 2002

***End Date*:** June 2005

Estimated Total ITS Funds: $827,318

Estimated Total Project Cost: $1,300,000

***Contacts*:**

Breck Jeffers	FHWA Maryland Division, HPT-MD	(410) 962-4342	Ext. 129
Mike Kinney	Montgomery DPWT	(240) 777-8760	

INTEGRATION PROJECT FOR OKLAHOMA CITY METROPOLITAN AREA

Description: This project is a component of the FY 2002 ITS Integration Program Oklahoma Statewide earmark. This project will integrate various existing ITS components, and newly deployed ones as they are activated, onto a common fiber optic communications backbone. A principal feature of the project is the I-44 Corridor integration activity which will integrate the Oklahoma City (OKC) Traffic Management Center with the OKC Traffic Maintenance Facility, OKDOTs Reno Traffic Operations Center, OKDOT's Central Office, OK State Highway Patrol and OK Transportation Authority.

Project Location: Oklahoma City, OK

Partner(s): FHWA, OKDOT, City of Oklahoma City, OK State Highway Patrol

Start Date: September 2002

***End Date*:** September 2003

Estimated Total ITS Funds: $203,100

Estimated Total Project Cost: $406,200

***Contacts*:**

Richard Jurey	FHWA Oklahoma Division, HDA-OK	(405) 605-6040	Ext. 323
Harold Smart	Oklahoma DOT	(405) 521-2861	
Alan Stevenson	Oklahoma DOT	(405) 521-2861	

INTEGRATION PROJECT FOR TULSA METROPOLITAN AREA

Description:

This project is a component of the FY 2002 ITS Integration Program Oklahoma Statewide earmark. This project will integrate various ITS components, both existing and being deployed concurrently with separate funding, onto a fiber optic communication backbone. The integration will enable multi-user participation among integrated agencies to ensure coordinated and effective response to incidents. Benefits of the integration include emergency management agencies in the Tulsa region which will be able to disseminate Emergency 911 traffic-related data and dispatch information to participating agencies.

The project will also facilitate traffic management center-to-traffic management center integration among the City of Tulsa, OKDOT, OK State Transportation Authority and the OK State Highway Patrol. As ITS elements are deployed, they will be integrated into the system. Current planning calls for Dynamic Message Signs, closed circuit TV camera, and Web cameras.

Project Location: Tulsa, Oklahoma

Partner(s): FHWA, OKDOT, City of Tulsa, OK Transportation Authority, OK State Highway Patrol

Start Date: September 2002

***End Date*:** September 2003

Estimated Total ITS Funds: $408,700

Estimated Total Project Cost: $817,400

***Contacts*:**

Richard Jurey	FHWA Oklahoma Division, HDA-OK	(405) 605-6040	Ext. 323
Harold Smart	Oklahoma DOT	(405) 521-2861	
Alan Stevenson	Oklahoma DOT	(405) 521-2861	

INTEGRATION PROJECT OF MULTIPLE STATEWIDE FACILITIES

Description: This project is a component of the FY 2002 ITS Integration Program Oklahoma Statewide earmark. This project, and two similar ones focused on metropolitan areas, are intended to demonstrate the benefits of integrating multiple agencies across jurisdictional boundaries to enhance transportation operations and efficiency. This project is a multi-phased activity which includes the design and implementation of a fiber optic communication backbone to support improved security and preparedness of the state's transportation infrastructure, and the establishment of a network for information sharing among 14 state, 8 local, and 9 Federal and military agencies.

Project Location: Oklahoma Statewide

Partner(s): FHWA, FAA, ODOT, State Highway Patrol Offices, Oklahoma Emergency Management Center, Oklahoma Capital Patrol, Oklahoma University, Oklahoma Transportation Authority, Association of Central Oklahoma Governments (ACOG), Oklahoma City, Indian Nations Council of Government (INCOG)

Start Date: September 2002

***End Date*:** June 2004

Estimated Total ITS Funds: $1,095,155

Estimated Total Project Cost: $2,190,310

***Contacts*:**

Richard Jurey	FHWA Oklahoma Division, HDA-OK	(405) 605-6040	Ext. 323
Harold Smart	Oklahoma DOT	(405) 521-2861	
Alan Stevenson	Oklahoma DOT	(405) 521-2865	

INTELLIGENT TRANSPORTATION SYSTEMS INTEGRATION PROJECT FOR TRANSPORTATION OPERATORS IN SOLANO COUNTY

Description:

Seven public agencies in Solano County, California, combine resources to provide a diverse and complete transportation infrastructure for their citizens. Services include local, intercity and express commuter general public fixed route bus, water ferry, general public demand response bus, and senior and handicapped demand response bus. These services are provided through a combined fleet of approximately 120 vehicles. Although two of the agencies are providing local service primarily, the other five provide regional services which operate between Solano and one or more surrounding counties. This project is designed to coordinate the development and implementation of a single Y2K compliant intelligent transportation system (ITS), for the seven operators based in Solano.

Project approach will be oriented to the development of a flexible and expandable base architecture. The goal is to allow the system to be dynamic and grow in capability and complexity over time. The initial work will be oriented to developing the Global Positioning System (GPS) capacity, such as Automated Vehicle Location (AVL) and on-time performance analysis. Secondary and tertiary enhancements could include expanded transit applications, as well as general traffic engineering and vehicle safety applications. National ITS Architecture Standards shall be used to develop these ITS.

Project Location: Solano County, California

Partner(s): FHWA, Cities of Fairfield, Benicia, Dixon, Rio Vista, Suisun City, Vacaville

Start Date: September 1999

***End Date*:** December 2003

Estimated Total ITS Funds: $792,470

Estimated Total Project Cost: $1,992,000

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(914) 498-5005
Kevin Daughton	City of Fairfield	(707) 428-7641

ITS DEPLOYMENT PROGRAM, SANTA TERESA, NEW MEXICO

Description:

This project is a multi-phased initiative to create the Border Technology Development Center (BTDC). Project funding is Congressionally-directed under the ITS Integration Program for FY 2000 and FY 2001. The purpose of the BTDC is to provide evaluation, testing, integration, verification and validation of border crossing technologies through deployment at an operational port of entry (POE). This deployment will facilitate movement of commerce across the border, and address a state and regional need resulting from saturation of capacity at adjacent POEs such as El Paso. This BTDC will serve as a test-bed where government agencies at the federal, state and local levels, as well as private sector entities can accomplish the following purposes:

- Test and evaluate new technologies.

- Refine technology applications and operational concepts.

- Train personnel under realistic conditions.

The first phase of this effort is a requirements definition or needs assessment that will result in a prioritization of ITS and other technology requirements for the region's international (Bi-State/Bi-National) border crossings. This requirements definition will serve as a template for future ITS design and development at the Santa Teresa POE. The second phase of this project, not included herein, will be support of deployment and testing of technologies at the Santa Teresa POE. A concurrent element of the project will be the creation of the FDA Agricultural Products Food Safety Laboratory, which will address a regional commercial vehicle operations border crossing program need.

Funding depicted below in Federal ITS Funds is a partial FY 2002 obligation. The earmarked amount is $1,183,228. As of the end of FY 2002 the difference had not been disbursed. The total cost figure is predicated on approval of the full amounts of the FY 2000 and FY 2001 earmarked funds.

Project Location: Santa Teresa Port of Entry, New Mexico

Partner(s): FHWA, New Mexico State University, New Mexico State Highway & Transportation Dept., El Paso MPO, Dept. of Agriculture, New Mexico Economic Development Dept., Texas DOT

Start Date: April 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $267,385

Estimated Total Project Cost: $2,355,456

***Contacts*:**

Joe Maestas	FHWA New Mexico Division, HDA-NM	(505) 820-2026
Bob Silver	NM State University	(505) 521-9274

ITS IMPROVEMENT PROJECT FOR NIAGARA INTERNATIONAL TRANSPORTATION TECHNOLOGY COALITION (NITTEC) AND WESTERN NEW YORK INCIDENT MANAGEMENT

Description: The purpose of this project is to further the ITS Integration efforts started under previous projects. The project will continue the integration of member agencies of NITTEC, begin to integrate the Western New York Incident Management Team, demonstrate the effectiveness of Video Incident Detection based on neural network technology, integrate an Automated Collision Notification (ACN) System, integrate local police automated vehicle location (AVL) systems, integrate a queue-end warning system, and provide integrated emergency management.

Project Location: Buffalo, New York

Partner(s): Niagara International Transportation Technology Coalition including: New York State DOT; New York State Thruway Authority; Niagara Falls Transportation Authority; City of Buffalo; City of Niagara Falls, NY; City of Niagara Falls, Ontario; Erie County; Niagara County; Town of Fort Erie, Ontario; Regional Municipality of Niagara, Ontario; Niagara Parks Commission; New York State Police; Niagara County Sheriff; Erie County Sheriff; Ontario Provincial Police; Greater Buffalo Niagara Regional Transportation Council; AAA of Western NY; Metro Networks

Start Date: September 1999

***End Date*:** December 2005

Estimated Total ITS Funds: $395,734

Estimated Total Project Cost: $1,283,000

***Contacts*:**

Jerry Zell	FHWA New York Division, HTS-NY	(518) 431-4125	Ext. 228
Tim Roach	NYSDOT Region 5, NITTEC TOC	(716) 847-2450	

JACKSON METROPOLITAN

Description: This project is the FY 2002 ITS Integration Program earmark for Jackson, Mississippi. The project seeks to address periodically extensive vehicle delays in Jackson's Central Business District at the convergence of several railroad tracks and their associated crossings. Expanding north-south and east-west rail traffic through central Jackson has caused extensive delays and potential safety hazards. This project will integrate dynamic message signs, planned for deployment on interstates and city streets, with the City of Jackson's Traffic Management Center (TMC) and the Mississippi Department of Transportation's TMC. The project will provide advanced warning messages to motorists and emergency services to facilitate rerouting around blocked arterials and freeway entrance/exit ramps. The project will leverage previously installed fiber optic-based connectivity between the two TMCs which allows sharing of data and video surveillance between the facilities.

Project Location: Jackson, Mississippi

Partner(s): FHWA, Mississippi DOT, City of Jackson, Kansas City Southern Railroad, Canadian National/Illinois Central Railroad

Start Date: October 2002

***End Date*:** October 2005

Estimated Total ITS Funds: $413,659

Estimated Total Project Cost: $827,318

***Contacts*:**

Mike Cribb	FHWA Mississippi Division, HDA-MS	(601) 965-4228
Scott Carson	FHWA Mississippi Division, HDA-MS	(601) 965-4232
Dan Gaillet	City of Jackson	(601) 960-1651

KANSAS CITY SCOUT

Description: This project combines the FY 2000 earmarks for Kansas City and Clay County, Missouri. The project's objective is to improve Incident Management and Freeway Management systems in the bi-state Kansas City metropolitan area. Among existing systems to be integrated by Kansas City SCOUT are vehicle detection devices, closed circuit television cameras, and dynamic message signs. These components are deployed along the 50 most congested freeway miles and will be linked to a Traffic Operations Center (TOC) scheduled to be operational in late CY 2001. The FY 2000 earmarked funding is targeted for hardware procurement for the TOC, design and installation of ITS field devices covering the Missouri River bridge crossings in Clay County, the development of integrated software for transit, and the deployment of ramp metering in Phase 1 of the project.

Project Location: Kansas City Metropolitan Area (including Clay County)

Partner(s): FHWA; MODOT; Kansas City Area Transportation Authority; Mid-America Regional Council; Clay County Highway Dept.

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $1,022,000

Estimated Total Project Cost: $2,044,000

***Contacts*:**

Bob Thomas	FHWA Missouri Division, HDA-MO	(573) 636-7104
Sabin Yanez	Missouri DOT	(816) 889-6450

KANSAS CITY, MISSOURI

Description:

This is the FY 2001 ITS Integration Program earmark for Kansas City, Missouri. The project will focus on integrating the Kansas City Scout freeway management system component with the Operation Green Light arterial management component through the deployment of roadside communications equipment and central control hardware and software for traffic signals at priority interchange ramps. These priority interchange ramps will provide an operational interface between the regional freeway and arterial management systems.

In addition to this work, the KC Scout will continue implementation of field device controllers and software that will enable the region to have state of the art equipment capable of operating many different applications, much like an advanced traffic controller. There will be a fully integrated ATMS workstation within the Traffic Operations Center that allows an operator, through a single software system, to move cameras, collect and read traffic data, contact outside agencies that are needed for incident management, and send real-time traveler information to the users of the transportation network.

Another element critical to the success of this system is the field controller. Up to this point in time all freeway ATMS have had to use traditional traffic signal controllers (170, 2070, etc.) because of their ability to collect loop data. KC Scout will develop and deploy a field-hardened, general-purpose computer for embedded applications, with the appropriate software and hardware to perform several specific applications for transportation management.

Another ITS deployment initiative underway in the Kansas City metropolitan area is the installation of an AVL system to the area's transit system. The transit improvement involves the replacement by the KCATA of its outdated signpost AVL system with GPS technology. This initiative will continue to develop and integrate interfaces needed to allow data collection from transit vehicles and to share data between stakeholders as identified in the regional architecture.

Project Location: Kansas City, Missouri

Partner(s): FHWA; FTA; Missouri DOT; Kansas DOT; Mid-America Regional Council (MARC); Kansas City Area Transportaiton Authority (KCATA); Kansas City, Missouri; Wyandotte County/Kansas City, Kansas.

Start Date: September 2001

***End Date*:** December 2004

Estimated Total ITS Funds: $992,018

Estimated Total Project Cost: $1,984,036

***Contacts*:**

Bob Thomas	FHWA Missouri Division, HDA-MO	(575) 636-7104
Bill Kalt	FTA Region 7	(816) 329-3927
Sabin Yanez	Missouri DOT	(816) 622-0450

LAREDO, TEXAS, INTEGRATION OF INTELLIGENT TRANSPORTATION SYSTEMS

Description:

The City of Laredo, Texas is experiencing rapid population growth and increases in vehicle traffic. It is projected that in the year 2000, the Port of Laredo will handle approximately 21 million vehicles. This project seeks to integrate a variety of ITS infrastructure components deployed in the Laredo area. The primary goal of the project is to accomplish as much integration and achieve as much system level functionality as possible within funding levels. Major project components include:

- Development of an ITS regional deployment plan and ITS regional architecture.

- Establishment of a fibre-based communications network connecting key operating agencies.

- Strategic upgrades to the TransGateway System enabling the area Transportation Management Center to function as a central repository and distribution point for transportation-related data, as well as to communicate with the Del Rio system.

- Development and installation of an automated traffic management system that provides single operator interface to video management and control systems, traffic monitoring and alarm systems, and motorist information systems such as dynamic message signs, lane control sign, highway advisory radios and communication management system.

- Development of systems monitoring and diagnostic routines to alert operators to actual or pending component failures and to allow operator remote diagnostic and troubleshooting capabilities--takes limited manpower resources into account.

- Design and implementation of a system that provides for sharing information between agencies with minimum of manual interface. Use of automated analysis and alarms to notify operators, develop scenario-based incident responses, and use outside local agency on evening and weekend operations.

Project Location: Laredo, Texas

Partner(s): Texas DOT, City of Laredo, Laredo Truckers Association, U.S. Border Patrol, Webb County

Start Date: December 1999

***End Date*:** June 2003

Estimated Total ITS Funds: $791,470

Estimated Total Project Cost: $1,582,940

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Roberto Rodriguez	Texas DOT (Laredo District Office)	(956) 712-7485
Bernie Walker	Texas DOT, TRF-TM	(512) 416-3437

MONROE COUNTY: CAMERA DEPLOYMENT AND SYSTEMS INTEGRATION

Description: This project is the FY 2001 ITS Integration Program Congressionally-directed deployment for Rochester, New York. Federal funding for this project was obligated in January 2002. The project will implement a camera deployment and integration program on Monroe County's busiest arterial routes. Critical components of the overall strategy for Monroe County include developing a shared communications backbone to serve freeway, arterial and emergency management needs. This infrastructure will be integrated into a new Regional Transportation Operations Center (TOC). This project will expand and integrate ATMS to the arterial system. This will include deployment of CCTV cameras, upgrades to the communications infrastructure, and work necessary to integrate NY State DOT and Monroe County DOT systems. System requirements for integration will consider the needs of other agencies, per the Regional ITS Architecture. Information will be monitored by Monroe County DOT and NY State DOT at the new Regional TOC. This project will make a significant contribution to the integration of information and control capabilities among the county and state DOTs and the New York State Police at the TOC.

Project Location: Rochester, New York

Partner(s): FHWA, New York State DOT, Monroe County DOT

Start Date: January 2002

***End Date*:** September 2004

Estimated Total ITS Funds: $550,000

Estimated Total Project Cost: $1,100,000

***Contacts*:**

Jerry Zell	FHWA New York Division, HDT-NY	(518) 431-4125
James Pond	Monroe County DOT	(585) 760-7755

MONTGOMERY, ALABAMA INTELLIGENT TRANSPORTATION SYSTEM

Description:

The principal objective of this FY 1999 ITS Integration Program project is the creation of a communications infrastructure to help integrate the highway, emergency services, and transit agencies in the Montgomery area. The project intends to connect CCTV cameras, vehicle detection system capabilities, dynamic message sign control software, advanced traffic signal control, incident/congestion tracking and management and GPS for transit on demand vehicles.

This project lays the foundation for the phased development of the Montgomery area ITS. The key components of the Montgomery ITS system as envisioned are:

1. Providing communications links to all stakeholders via a fiber optic network.

2. Providing real time information on congestion and incidents to stakeholders. This will require software to "flag" incidents and provide a graphic illustration of congestion levels throughout the Montgomery system.

3. Managing incidents through improved response times and efficiencies. An incident response/diversion plan will be developed with input from all primary stakeholders.

4. More efficiently managing the demand responsive transit system in place in Montgomery. Use of the incident/congestion information and GPS for transit vehicle location is proposed.

Project Location: Montgomery, Alabama

Partner(s): Alabama DOT, City of Montgomery

Start Date: September 1999

***End Date*:** September 2003

Estimated Total ITS Funds: $989,337

Estimated Total Project Cost: $2,780,700

***Contacts*:**

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377	
Lewis Harden	FHWA Alabama Division, HDA-AL	(334) 223-7390	Ext. 230
Ed Kelly	Alabama DOT	(334) 241-8551	

NEW ORLEANS, LOUISIANA

Description: This project is the FY 1999 ITS Integration Program earmark for New Orleans, Louisiana. Federal ITS funding was carried over to FY 2000 and obligated in September 2000. The project seeks to establish critical communications links to operational centers of key agencies in a planned ATMS/ATIS for New Orleans Region. Initial efforts are systems integration and design services for Interagency Communications, Command, and Control (IC3) System and the Integrated Data, Display, and Distribution (ID3) System. This will be followed by Installation and Integration of the IC3 System and Construction and Installation Services for the ID3 System. These installations will lay the foundation for integration of ITS infrastructure elements in future work orders.

Project Location: New Orleans, Louisiana

Partner(s): FHWA, Louisiana Department of Transportation and Development, New Orleans Metropolitan Area Regional Planning Commission, Louisiana State Police, Greater New Orleans Expressway Commission, local metro area law enforcement agencies

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $1,187,204

Estimated Total Project Cost: $2,374,409

***Contacts*:**

John Broemmelsiek	FHWA Louisiana Division, HDA-LA	(225) 757-7614
Steve Glascock	Louisiania State DOT	(225) 935-0130

NEW YORK CITY MULTI-OPERATING AGENCY INTEGRATED TRANSPORTATION MANAGEMENT SYSTEM (ITMS)

Description:

This project is a component of the development, implementation and operation of an integrated multi-agency transportation system. The focus of the Integrated Transportation Management System (ITMS) will be integration of communications and operations. The project is phased into two tasks:

-- Design and implementation of ITMS;

-- Design and implementation of an ITS Archive/Planning Subsystem for New York City with a focus on developing an integrated repository for historical data generated by the ITMS.

Project Location: New York City, New York

Partner(s): FHWA, New York State DOT; New York City DOT; TRANSCOM; Metropolitan Transit Authority

Start Date: September 1999

***End Date*:** October 2003

Estimated Total ITS Funds: $1,978,674

Estimated Total Project Cost: $2,573,000

***Contacts*:**

Arthur O'Connor	FHWA New York Division NYC Metro Office	(212) 668-2206

NEW YORK CITY/LONG ISLAND TRANSPORTATION MANAGEMENT CENTER (TMC) INTEGRATION

Description: This FY 1999 ITS Integration Program project shall integrate two existing traffic management centers, the joint NYSDOT/NYCDOT Transportation Management Center in New York City and the NYSDOT's Long Island Transportation Management Center on Long Island.

Project Location: New York City and Long Island, New York

Partner(s): FHWA, New York State DOT, New York City DOT, Metropolitan Transit Authority, TRANSCOM

Start Date: September 1999

***End Date*:** June 2005

Estimated Total ITS Funds: $1,300,380

Estimated Total Project Cost: $1,625,475

***Contacts*:**

Arthur O'Connor	FHWA New York Division NYC Metro Office	(212) 668-2206

NORTH CENTRAL ILLINOIS INTEGRATED TRAFFIC MANAGEMENT SYSTEMS

Description: This project is a component of the FY 2001 ITS Integration Program Congressionally-directed earmark for the State of Illinois. The project supports a regional transportation management system under development in North Central Illinois and Southwest Wisconsin. The project objectives include installation and integration of two dynamic message signs in North Central Illinois.

Project Location: Winnebago County (I-39), Illinois

Partner(s): FHWA, Illinois DOT, Iowa DOT, Illinois State Toll Authority, Wisconsin DOT

Start Date: April 2002

***End Date*:** December 2004

Estimated Total ITS Funds: $260,000

Estimated Total Project Cost: $520,000

***Contacts*:**

Wendall Meyer	FHWA Illinois Division, HDA-IL	(217) 492-4634
Kevin Marchek	Illinois DOT	(815) 284-5395

OAKLAND ITS AND PUBLIC SAFETY INTEGRATION PROGRAM

Description:

This project is the FY 2000 ITS Integration Program earmark for Oakland, CA, funding for which was obligated in September 2001. The project objective is to integrate the transportation management capabilities of the San Pablo Avenue Smart Corridor project with the City of Oakland's Emergency Management Center functions.

The San Pablo Avenue Smart Corridor Project includes implementation of advanced transportation management functions for participating agencies to improve management of traffic conditions along the San Pablo Avenue and Highway 80 Corridor. The San Pablo Corridor has received federal funding for deployment of field sensors to monitor traffic and to provide real-time traveler information. These devices are complemented by the implementation of a data and video exchange system. This project seeks to integrate the transportation management and field devices of the San Pablo Corridor with the City of Oakland's Signal Control System and Emergency Management Center. In addition to the integration of transportation management and traveler information systems with the public safety system, the project will be integrated with the regional Advanced Traveler Information System (TravInfo) to disseminate traveler information through kiosks and the Internet.

Project Location: Oakland, California

Partner(s): FHWA, City of Oakland

Start Date: September 2001

***End Date*:** December 2003

Estimated Total ITS Funds: $393,000

Estimated Total Project Cost: $790,000

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(914) 498-5005
Amit Kothari	City of Oakland, Public Works Agency	(510) 238-3469

REGIONAL TRANSPORTATION INFORMATION MANAGEMENT CENTER

Description:

This project combines FY 1999 and 2001 ITS Integration Program earmarks for Scranton (FY 1999) and Carbondale (FY 2001) Pennsylvania. The project objective is the establishment of a Regional Transportation Information Management Center (RTIMC) identified in a comprehensive regional Strategic Deployment Plan as the critical component in developing a reliable, multi-agency communication network to facilitate regional information sharing employing the "clearinghouse" concept. The project planning calls for the RTIMC to offer an architecture capable of supporting real-time information sharing for regional public safety, incident management, emergency response, transportation planning/management, transit management, paratransit and demand-responsive transit, and traveler information.

Initially the RTIMC will serve as the key traffic management facility in the Lackawanna/Luzerne area including strategic rural corridors. Phased over time, additional functions will include:

- Freeway network performance monitoring to include incident/congestion events.
- Closed circuit TV-based incident verification and congestion analysis.
- Passing traffic-related information to PennDOT Maintenance and State Police.
- Operating Dynamic Message Signs and Highway Advisory Radios.
- Updating incident detection algorithms and testing new control strategies, and
- Routine record keeping, planning and coordination for system response to a variety of activities such as construction and maintenance.

Utilization of the clearinghouse concept will enable participating agencies to retain control while permitting data collection from multiple sources; facilitating maintenance of a single, integrated data source; centralizing regional information management and dissemination.

Funding levels depicted below include a partial obligation of FY 1999 Federal ITS funds and State match of $952,879. The entire FY 1999 earmark is $792,000 and the FY 2001 earmark is $1,590,729.

Project Location: Northeast Pennsylvania

Partner(s): FHWA, PennDOT, Carbondale Technology Transfer Center (CTTC), Lackawanna County MPO, Luzerne County MPO, Northern Tier Regional Planning and Development Commission, Economic Development Council, Northeast Pennsylvania Transportation Committee

Start Date: September 2001

***End Date*:** September 2003

Estimated Total ITS Funds: $304,000

Estimated Total Project Cost:

$1,256,879

Contacts:

Jessie Yung	FHWA Pennsylvania Division, HIT-PA	(717) 221-4422	
J. W. Sharp	Carbondale Technology Transfer Center	(570) 282-1255	Ext. 220

REMOTE TRAFFIC MANAGEMENT CENTER AND TRAVELER/PUBLIC INFORMATION ACCESS CENTER - MISSION VIEJO, CALIFORNIA

Description:

This project is the FY 1999 ITS Integration earmark for the City of Mission Viejo, CA. This project complements previous Mission Viejo investments in ITS infrastructure, and focuses on deployment and integration of Advanced Traveler Information Systems (ATIS) components with built-in redundancy for a remote Traffic Management Center (TMC) during emergencies and natural disasters such as earthquakes. Project implementation is comprised of three major initiatives:

- Design of a multi-purpose remote TMC and public and business information access center adjoining the City's public library, including space planning for remote workstations for traffic control and information access.

- Construction of a multi-purpose facility to provide training and to meet community travel and business information access needs.

- Implementation and integration of ITS workstations, hardware and software components and establishing communication intertie to Caltrans District 12.

Project benefits include additional operations capability and redundancy. The remote TMC will serve as a permanent TMC in the event the city hall is moved from its current location; provide redundancy in emergency and natural disaster situations; provide remote communication intertie access to Caltrans District 12, TravelTIP and adjacent jurisdictions; and will provide "one-stop shopping" to commuters and business communities in terms of traveler and public information access.

FY 2000 ITS Integration Program earmarked funding in the amount of $786,420 was approved in September 2002, and is included in ITS cost shown below.

Project Location: Mission Viejo, California

Partner(s): City of Mission Viejo, Caltrans, Orange County Transportation Authority

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $1,577,889

Estimated Total Project Cost: $8,455,780

***Contacts*:**

Gloria Stoppenhagen	FHWA LA Metro Office	(213) 202-3955
Mrs. Shirley Land	City of Mission Viejo Dept. of Public Works	(949) 470-3069

ROCHESTER ITS EVALUATION AND INTEGRATION PLANNING

Description: This project is one of several FY 2001 ITS Integration Program earmarks for the Rochester, NY area. The project will conduct a study of benefits derived from ITS infrastructure deployments initiated in prior fiscal years. The evaluation will also include an integration planning component which will use findings as the basis for proposing system integration improvements, and clarifying agency responsibilities associated with the regional Airport/Transportation Operations Center.

Project Location: Rochester, New York

Partner(s): FHWA, New York State DOT, Monroe County DOT

Start Date: September 2001

***End Date*:** December 2004

Estimated Total ITS Funds: $90,422

Estimated Total Project Cost: $297,376

***Contacts*:**

Jerry Zell	FHWA New York Division, HDT-NY	(518) 431-4125	Ext. 228
James Willer	New York State DOT	(716) 272-3450	

ROCHESTER, NEW YORK CONGESTION MANAGEMENT

Description: The purpose of this project is to provide integration of existing Road Weather Information System and highway maintenance functions with new traffic management and traveler information functions such as variable message signs and highway advisory radio.

Project Location: Rochester, New York

Partner(s): FHWA, New York State DOT

Start Date: August 1997

***End Date*:** March 2003

Estimated Total ITS Funds: $1,500,000

Estimated Total Project Cost: $7,513,562

***Contacts*:**

Jerry Zell	FHWA New York Division, HTS-NY	(518) 431-4125	Ext. 228
Jim Willer	New York State DOT	(716) 272-3450	

SALT LAKE OLYMPIC ITS

Description:

This project is one of the FY 2001 ITS Integration Program earmarks for the Salt Lake City, Utah urbanized area. This earmark builds on project elements orginiated in FY 2000 under the title, CommuterLink, and will enhance subsystems dedicated to integrating traffic management, transit management, emergency management and traveler information systems. The FY 2001 earmark will develop the following system enhancements:

- Department of Public Safety Dispatch Center Expansion to improve response times in surrounding counties.

- Traffic Operations Center Communication enhancements to satisfy operational requirements during the Olympics. Improvements entail installing wireless Internet connections, additional power outlets and installation of audio/visual equipment.

- Installation of Highway Advisory Radio in key rural areas along Olympic routes.

- Communication to Remote Traffic Signals to enable Traffic Operations Center managers to adjust signal timings to accommodate change in traffic patterns as Olympic events cause surges.

- Light Rail Transit (LRT) Platforms will have information systems deployed for real-time information dissemination regarding arriving LRT vehicles. System-wide information will also be relayed to platforms.

- Olympic Automatic Vehicle Location (AVL) installations on key Olympic vehicles to enhance security of athletes and officials during transit between events. After the Olympics, these AVL units will be redeployed to highway patrol, highway maintenance and fire department vehicles.

Project Location: Salt Lake City, UT

Partner(s): FHWA; FTA; Utah DOT; Utah Transit Authority; Utah Department of Public Safety; Salt Lake County; Wasatch Front Regional Council; Mountainland Association of Governments; Salt Lake Organizing Committee; Salt Lake City; Cities of South Salt Lake, Draper, Taylorsville, Sandy City, Midvale, Murray City, West Jordan

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $793,615

Estimated Total Project Cost: $1,590,728

***Contacts*:**

Russell Robertson	FHWA Utah Division, HPM-UT	(801) 963-0078	Ext. 229
Martin Knopp	UTAH DOT	(801) 965-4894	

SALT LAKE VALLEY ATMS SYSTEMS INTEGRATION

Description:

This project will integrate the various physical components and develop other support systems for the Salt Lake Valley Advanced Traffic Management System (ATMS) operation, a fully functional system between the Utah DOT, Salt Lake City and Salt Lake County. The system integrator is responsible for the overall implementation and operation of all the various system components which are being deployed for the ATMS. The field equipment, communication facilities and control centers are being implemented by four different ATMS projects. The ATMS will provide integrated, multi-agency, multi-modal traffic management capabilities to support the safe and timely movement of people and goods in the region. The system will support network surveillance, surface street control, freeway control, HOV lane management, traffic information dissemination, regional traffic control, and incident management.

The system integrator will coordinate the work of this project with the efforts of the consultants and contractors for the other four projects which are being implemented for the other portions of the ATMS. This will ensure operational compatibility among the various field elements, central control centers and corresponding elements. The project will implement a traffic signal system to provide central monitoring and control capabilities within the Salt Lake Area. The project will use the 2070 controller firmware to provide local processing of freeway detectors and ramp meter control. The Salt Lake County control center will use Georgia DOT software. Other activities to be completed as a part of this project include integrating ATMS with the DOT Public Safety dispatch system, develop real-time data exchange with Utah Transit Authority prototype signal priority projects, develop a regional ITS Architecture, and enhance functionality of UDOT's winter maintenance by integrating RWIS with snowplow AVL and ATMS.

Project Location: Salt Lake Valley, Utah

Partner(s): Utah DOT, Salt Lake City, Salt Lake County

Start Date: September 1997

***End Date*:** March 2003

Estimated Total ITS Funds: $8,500,000

Estimated Total Project Cost: $10,625,000

***Contacts*:**

Russell Robertson	FHWA Utah Division, HPM-UT	(801) 963-0078	Ext. 229
Martin Knopp	Utah DOT	(801) 965-4894	

SAN FRANCISCO, CALIFORNIA INTEGRATED TRANSPORTATION MANAGEMENT SYSTEM PROJECT

Description:

The San Francisco Integrated Transportation Management System (ITMS) is a city-wide real-time transportation management system which includes various ITS infrastructure components suited for traffic conditions unique to San Francisco. The system when completed will provide the following benefits:

- Inproved traffic flow and safety;
- Reduced congestion;
- Availability of real-time traffic information to motorists;
- Improved responsiveness to planned events and incidents;
- Enhanced communications.

Several key concepts to be implemented through the ITMS project include:

- Development and implementation of an integrated network to exchange data and video feeds, and improvement of cross-jurisdictional response capabilities.
- Providing the foundation for inter-agency coordination and operation with Caltrans/CHP TMC and MTC TravInfo. The TMC and TravInfo play an important role in empowering the San Francisco Bay Area region with the most advanced transportation management tools to optimize use of transportation facilities in the region.
- Providing the necessary functional requirements for other local/regional jurisdictions to interface their ITS elements with those of San Francisco.

Project Location: San Francisco, California

Partner(s): California DOT (Caltrans), California Highway Patrol (CHP), Metropolitan Transportation Commission (MTC) TravInfo, MUNI (San Francisco Public Transportation Department), San Francisco 911 Emergency Center, City of Daly City, Golden Gate Transit, AC Transit

Start Date: September 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $1,187,000

Estimated Total Project Cost: $4,110,000

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(916) 498-5005
Cheryl Liu	City & County of SF Dept. of Traffic & Parking	(415) 554-2312

SILICON VALLEY TRANSPORTATION MANAGEMENT CENTER

Description: The project is the FY 2002 ITS Integration Program earmark for San Jose, CA. The project is one of a series of ITS projects in a 20-year strategic planning process being implemented by Santa Clara County which identified a sub-regional transportation management center (TMC) as a key requirement. This FY 2002 ITS project will integrate multiple video systems deployed in the Silicon Valley ITS network, and optimize the use of the Silicon Valley ITS Program Communications network to facilitate addition of new partner agencies, and integrate an existing incident management system with a planned Web Traveler project.

Project Location: San Jose, CA

Partner(s): FHWA, California DOT; Santa Clara County; Caltrans District 4; California Highway Patrol, Santa Clara Valley Transportation Authority; Cities of San Jose, Milpitas, Campbell, Santa Clara, Los Gatos; Metropolitan Transportation Commission

Start Date: September 2002

***End Date*:** April 2004

Estimated Total ITS Funds: $579,123

Estimated Total Project Cost: $1,158,246

***Contacts*:**

Frank Cechini	FHWA California Division, HDA-CA	(916) 498-5005
Lily Lim-Tsao	San Jose DOT	(408) 277-2549

SOUTH CAROLINA DOT STATE TRAFFIC MANAGEMENT CENTER DEVELOPMENT

Description:

This project is the FY 2002 ITS Integration Program earmark for South Carolina. The project objective is to integrate a wide variety of ITS devices deployed throughout the State, and implement an expanded State Traffic Management Center (TMC). This TMC will function as a central clearing facility to receive and disseminate traffic information. The sources feeding the TMC include local DOT systems, video from city and county governments, and DOTs from adjoining states. The video will be made available to the South Carolina Highway Patrol, the State Emergency Management Center, local traffic control centers, and TMC in adjoining states.

The project will implement the communications network required to receive, integrate and disseminate data statewide. ITS infrastructure included in this endeavor consists of:

- 53 Dynamic Message Signs.
- 17 State Highway Emergency Program units.
- In excess of 100 Closed Circuit TV Cameras.
- 70 side-fire radar units.
- 12 portable, solar-powered Highway Advisory Radio units.
- Video Cameras positioned on paved median crossovers on Interstates which would carry hurricane evacuation traffic inland, and which have been designated as lane reversal highways.

Project Location: Columbia, South Carolina

Partner(s): FHWA, South Carolina DOT, Beaufort County Emergency Management Center

Start Date: September 2002

***End Date*:** April 2004

Estimated Total ITS Funds: $2,481,955

Estimated Total Project Cost: $4,963,910

***Contacts*:**

David Morris	FHWA South Carolina Division, HDA-SC	(803) 253-3883
Richard Werts	South Carolina DOT	(803) 737-1462

SPOKANE COUNTY, WASHINGTON

Description:

This project is the FY 2001 ITS Integration Program earmark for Spokane County, Washington. The project will implement several related travel management initiatives defined in the Regional ITS Architecture and mid-range plans. Elements include:

- Traveler Information System - A web-based subscription traveler information system that will disseminate route specific information by e-mail and pager. Traveler advisories will include incident, construction, and weather-related information as well as transit updates.

- Development of a Regional Data Warehouse - The FY 2001 Congressionally directed funding will be allocated to analyses of database design alternatives.

- Enhancement of the Road Weather Information System - This initiative would upgrade a server currently in use, and is anticipated to expand use of the system by maintenance personnel.

- Communication Trunk Lines - This activity will install communications trunk lines along two major corridors in the region which will provide connectivity between light rail stations and transit management links.

- Coordinated Incident Response Application - This project element will improve coordinated regional responses to incidents.

- Regional Transportation, Weather and Construction Website - This project element will provide access to a real-time, regional source of transportation, weather and construction information from a single source.

Project Location: Spokane, Washington

Partner(s): FHWA, Washington State DOT, SRTC, Spokane County, City of Spokane, Spokane Transit Authority

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $793,615

Estimated Total Project Cost: $2,218,251

***Contacts*:**

Michael Brower	FHWA Washington Division, HPM-WA	(360) 753-9550
Kenneth Knutson	WSDOT	(509) 343-6383

SPOKANE REGIONAL TMC INTEGRATION

Description:

This FY 2000 earmarked project seeks to enable the Spokane Regional Traffic Management Center (SRTMC) and associated agencies to share information thus ensuring the interoperability of all agencies' devices. A related objective is the funding of system integration efforts in accordance with Regional ITS Architecture planning.

The Spokane metropolitan area has experienced significant population growth in the last decade. The population growth has increased congestion as well as pollution levels. The Spokane area has been designated by EPA as a non-attainment area for air quality. In recognition of the need to manage traffic on key arterial corridors in the most efficient manner, the SRTMC is intended to provide wide area coverage and early incident detection and warning during peak travel periods. As the pivotal facility in a regional approach to traffic and incident management, the SRTMC requires an inter-agency communications infrastructure. This project seeks to create a regional transportation local area network (LAN) to facilitate interoperability among all transportation agency devices. The project will fund development of a regional Web page that will incorporate the different transportation-related Web pages from each participating agency into a regional site. Closed circuit TV images, traffic counts, dynamic message sign signage, construction project updates, highway advisory radio messages, and weather conditions are examples of the elements to be integrated.

Project Location: Spokane, Washington Metropolitan Area

Partner(s): FHWA, Spokane Regional Transportation Council; Spokane County; City of Spokane; Spokane Transit Authority; Washington State Police

Start Date: September 2000

End Date: March 2003

Estimated Total ITS Funds: $393,211

Estimated Total Project Cost: $1,452,211

Contacts:

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Kenneth Knutson	WSDOT	(509) 343-6383

ST. LOUIS REGION SMART INTEGRATED METROPOLITAN AREA MAP

Description:

The objective of this FY 1999 ITS Integration Program project is the development of a Smart Integrated Metropolitan Area Map for the St. Louis region. The development of a common base automated map display that can be used to disseminate information to all local transportation service providers and partners is a critical step in the development of an integrated regional transportation network.

This project's development schedule has been extended due to delays in software development in a related project on which it is dependent.

Information from freeway, incident and corridor management subsystems will be displayed on this common base map. It will be a key part to this region's transportation integrated network. The St. Louis Metropolitan Planning Organization (East West Gateway Coordinating Council - EWGCC) region extends into two states and has over 100 local governmental entities. The following developmental components of this common base map are:

- Identification of User Needs - Data Collection.
- Establishment of Mapping Requirements.
- Development of Architecture and Design.
- Digitalization of Transportation Facilities.
- Testing and Evaluation.
- Deployment to Regional Partners.
- Maintenance of Map.

Many agencies presently need and use mapping information in the St. Louis Metropolitan Area. They have developed their own base maps to reflect the many different services they provide (water, sewer, transportation facilities, etc.). These activities will be expanded and enhanced to develop an integrated map.

With the Intelligent Transportation System about to become a reality in the area, a need for a base map that would match the maximum number of jurisdictions (with well over 100 local agencies) is highly desirable. The standard setting inherent in this map will both identify the current differences, confirm interfaces or modifications, and allow entry anywhere on the system. This would reduce or eliminate data re-entry to provide the regional information.

Project Location: St. Louis Region

Partner(s): Missouri DOT, Illinois DOT, The East West Gateway Coordinating Council, St. Louis Metropolitan Planning Organization

Start Date: September 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $593,602

Estimated Total Project Cost: $1,193,602

Contacts:

Bob Thomas	FHWA Missouri Division, HDA-MO	(573) 636-7104
Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634

STATE OF ILLINOIS; ADVANCED TRAFFIC MANAGEMENT SYSTEM (GATEWAY GUIDE)

Description:

This is a discretionary project of the FY2000 ITS Deployment Program for the State of Illinois.

GOALS AND OBJECTIVES

The goals of this project are ultimately to improve safety and mobility. This is to be accomplished by integrating ITS components and sharing data and video images between IDOT and the Missouri Department of Transportation (MoDOT), providing communication links between IDOT's communication center and its field devices, improving traveler information to the public, encouraging inter-jurisdictional coordination, and reducing institutional barriers. This is further detailed in the following Scope of Work.

SCOPE OF WORK

The IDOT District 8 in Collinsville, Illinois in conjunction with MoDOT District 6 in St. Louis, Missouri is currently deploying a regional Intelligent Transportation System (ITS) to serve the bi-state St. Louis metropolitan area. This regional system has been named Gateway Guide.

This project will allow IDOT to provide real-time traffic data that completes the regional system, to respond more efficiently to incidents on the interstate, and to manage the regional ITS more effectively. Ten color surveillance cameras with pan-tilt-zoom capabilities will be installed in the Illinois portion of the metropolitan area along Interstates 55/70, 64, and 270, the Martin Luther King Jr. Bridge, and Illinois Route 3. This project also includes installing all of the monitors, camera controls, and communication equipment at IDOT's communication office. The communication links between the surveillance cameras and the communication office and between IDOT and MoDOT will be established with this project.

A software consultant will be retained to develop and implement software at the IDOT communications office that will integrate all of the ITS field equipment operations and to automate the real-time responses to traffic conditions. This software will allow the information collected by the ITS equipment to be transmitted on the Gateway Guide web site and the regional traffic information hotline. The Gateway Guide web-site will display a regional map that provides a color-coded speed map, incident icons, construction icons, snap-shot images from the regional surveillance cameras, average speeds at each detector, and current messages on the regional dynamic message signs.

The consultant will also develop and implement modifications to the IDOT district communication office to accommodate the additional ITS equipment. The modification includes an electronic communication link between IDOT's communications office and MoDOT's TIC and the hardware required to maintain this link. This project will also provide the appropriate equipment that will allow data and video images to be transmitted between IDOT and MoDOT. This new equipment will allow for future data and image integration with the Illinois State Police, local police departments, emergency response agencies, St. Clair and Madison County Transit Districts, and other municipalities. The communications office will be remodeled to allow scanning tours to visit the facility without interrupting the daily operations and to accommodate the additional equipment.

Project Location:

State of Illinois - Various Interstates and Martin Luther King Bridge

Partner(s):

FHWA, Illinois DOT, Missouri DOT

Start Date: February 2001

***End Date*:** January 2005

Estimated Total ITS Funds: $594,632

Estimated Total Project Cost: $1,189,264

Contacts:

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
David Zavattero	Illinois DOT, ITS Program Office	(847) 705-4800
Jennifer Obertino	Illinois DOT, District 8	(618) 346-3275

STATE OF MONTANA

Description: This project is the FY 2001 ITS Integration Program earmark for the State of Montana. The project's purpose is to develop a shared public roads transportation information systems framework capable of ultimately supporting a wide variety of transportation-related applications. The project will advance user access to digital, geographic ground transportation databases. Subsequent to the collection and verification of public roads framework data, a statewide, geographic information systems for transportation (GIS-T) will be established. A pilot project will demonstrate an automatic vehicle location (AVL) capability that utilizes a subset of the GIS-T framework.

Project Location: Montana

Partner(s): FHWA, Montana DOT, Montana Association of Counties, Montana Interagency Technical Working Group, Subcommittee on Transportation

Start Date: April 2002

***End Date*:** July 2005

Estimated Total ITS Funds: $596,000

Estimated Total Project Cost: $1,191,000

***Contacts*:**

Bob Seliskar	FHWA Montana Division, HDA-MT	(406) 449-5302	Ext. 244
Mike Randall	Montana DOT	(406) 444-6319	

STATE OF NEW JERSEY

Description:

This project comprises the ITS Integration Program earmark for the State of New Jersey and TRANSCOM for FY 1999, 2000, and 2001. Originating in FY 1999 as the State of New Jersey earmark, the project has been extended and expanded in FY 2000 under the project title "Statewide TRANSCOM/TRANSMIT Upgrades" and in FY 2001 under the title "New Jersey Regional Integration/TRANSMIT." TRANSCOM is the coalition of 16 transportation agencies in the New York/New Jersey/Connecticut region which provides a cooperative, coordinated approach to regional transportation management.

The originating FY 1999 earmarked project expanded TRANSMIT-TRANSCOM's System for Managing Incidents and Traffic. TRANSMIT integrates the region's electronic toll system (E-Z Pass) with traffic and transit operations by using E-Z Pass toll tags as probes to support incident detection and calculation of travel times. The FY 1999 project objective was to integrate the TRANSMIT system across jurisdictions, agency and geographic boundaries using the existing TRANSCOM regional architecture. The project installed readers on Garden State Parkway, the NJ Turnpike and on selected key NJ DOT-controlled highways. An additional feature included providing readers at all 18 NJ Transit bus garages to monitor the movement of NJ Transit buses. FY 1999 ITS funding was $2,024,407; and total funding was $4,048,813.

FY 2000 component of this project (Statewide TRANSCOM/TRANSMIT Upgrades) focused on installing readers on the Merritt Parkway in Connecticut, the Belt Parkway system in New York City, the I-84 approaches to the Newburgh-Beacon Bridge and selected New Jersey expressways. The project also integrates TRANSMIT with members' variable message sign (VMS)/highway advisory radio (HAR) systems and with Integrated Remote Video Network (IRVN) through the regional architecture. FY 2000 ITS funding is $3,145,684; total funding is $6,291,368.

The FY 2001 earmark (New Jersey Regional Integration/TRANSMIT) continues the integration of additional ITS elements into the TRANSCOM regional architecture. Principal components include integration of additional data interfaces with the architecture, integrating ITS-generated weather data, and developing stand-alone power and communications for TRANSMIT readers to reduce capital and O & M costs. Finally, the FY 2001 project seeks to expand TRANSMIT in TRANSCOM's 29-county NY/NJ/CT region. FY 2001 ITS funding is $2,386,093; total funding is $4,772,186.

Project Location:

New Jersey

Partner(s):

FHWA, New Jersey Highway Authority; The Port Authority of New York and New Jersey; New Jersey Turnpike Authority; New Jersey DOT; MTA Bridges and Tunnels; New Jersey Transit

Start Date:

September 1999

End Date:

April 2003

Estimated Total ITS Funds: $7,556,184

Estimated Total Project Cost: $15,112,367

Contacts:

Keith Sinclair	FHWA New Jersey Division, HTC-NJ	(609) 637-4204
Matthew Edelman	Executive Director, TRANSCOM	(201) 963-4033

SUTTER COUNTY, CALIFORNIA

Description: This project produced an evaluation of deployment of state-of-the-art traffic signal pre-emption equipment, call boxes, automated vehicle location on transit vehicles and emergency vehicle vision enhancement in Sutter County. Subsequent to this evaluation, completed in June 1998, Federal funding of project operational experience has been provided pursuant to an agreement to perform an evaluation and produce a final report. The end date is the scheduled delivery date of the report.

Project Location: Sutter County, California

Partner(s): Sutter County Department of Public Works

Start Date: April 1996

***End Date*:** March 2003

Estimated Total ITS Funds: $1,750,000

Estimated Total Project Cost: $2,400,000

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(916) 498-5005
Robert Barrett	Sutter County Department of Public Works	(916) 741-7450

THE ROAD INFRASTRUCTURE MANAGEMENT SYSTEM PROJECT FOR WAYNE COUNTY, MICHIGAN-RIMS

Description:

This project is the FY 2000 Wayne County, Michigan Earmark; it constitutes Phase I of a three-year project. Wayne County has initiated a multi-year plan to establish an integrated Geographical Information System (GIS) to include all operational elements in the county. The Road Infrastructure Management System (RIMS) is a management system for planning, designing, building, operating and maintaining the roadway infrastructure in Wayne County. RIMS will have the capability of providing real-time transportation information on alternative travel routes and transportation modes which can be accessed via the Internet. The communications media will also be able to assess information for broadcast to the general traveling public. The Phase I objective of this project is to build an infrastructure to enable Wayne County and local communities to prepare for the use of future ITS systems more efficiently. Ultimately, RIMS will enable agencies at all levels of government to:

- Access information needed to conduct routine business;
- Track and monitor daily road conditions;
- Provide accident/incident mapping and road history tracking;
- Provide tools needed to perform impact analysis;
- Track project status;
- Provide a mechanism for complaint analysis/response;
- Provide and track maintenance history.

Project Location: Wayne County, Michigan

Partner(s): FHWA; Wayne Co. Department of Public Services; Wayne Co. Geographic Information System Management Unit; City of Dearborne; City of Gross Point Woods; City of Inkster; City of Redford; City of Wayne

Start Date: March 2002

***End Date*:** September 2003

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $1,572,842

***Contacts*:**

Morrie Hoevel	FHWA Michigan Division, HDA-MI	(517) 702-1834
Paul McNamara	Wayne Co. Dept. of Public Service	(313) 224-8756

TOWAMENCIN, PENNSYLVANIA REGIONAL ITS CENTER

Description: This project is a FY 2000 earmark. This ITS initiative led by Towamencin Township in partnership with Montgomery County, Penn DOT, the PA Turnpike Commission and private sector partners will construct a multi-modal Transportation Center at the PA Turnpike/I-426 Landsdale Interchange. The Regional ITS Center will constitute a major component of the Transportation Center. The Regional ITS Center will house the central computers and personnel which will initially operate the Township's closed-loop traffic signal system, incident management system, and emergency services management system. With full implementation of the multi-modal Transportation Center, the Regional ITS Center's functions will expand, to include electronic bus transit and parking fare collection; paratransit and demand-responsive dispatching of shuttle services between the Transportation Center and major area employers; traveler information services for Transportation Center users, and the provision of real-time information to other traveler information providers, such as the PA Turnpike Commission and Penn DOT.

Project Location: Towamencin Township, Montgomery County, PA

Partner(s): FHWA, Towamencin Township, Montgomery County Planning Commission, Southeastern PA Transportation Authority, Delaware River Regional Planning Commission, Pennsylvania Turnpike Commission

Start Date: September 2000

***End Date*:** December 2004

Estimated Total ITS Funds: $471,853

Estimated Total Project Cost: $950,000

***Contacts*:**

Carmine Fiscina	Philadelphia FHWA Metro Office, PMO-PA	(215) 656-7111
John Granger	Towamencin Township	(215) 368-7602

TRANSPORTATION RESEARCH IMPLEMENTATION CENTER FOR OPERATIONS AND MANAGEMENT

Description:

This project is the FY 2000 ITS Integration Program earmark for College Station, Texas. Federal funding was obligated July 2001. The Texas Transportation Institute in partnership with the Texas Department of Transportation is deploying a Transportation Implementation consortium for Operations and Maintenance to support improved transportation system operations and management. This center will seek to accelerate integration and interoperability of ITS across system, modal and jurisdictional boundaries in rural, metropolitan, regional and statewide settings. Areas of focus will be transportation system management, emergency response management, transit management and highway-rail intersection safety.

The technical approach is the operation of a facility and support staff needed to deliver ITS research products to practice in order to facilitate integration and interoperability. Approaches to be used include Web-based information, workshops, and on-site technology transfer.

Project Location: College Station, Texas

Partner(s): FHWA, Texas DOT, Texas Transportation Institute

Start Date: July 2001

***End Date*:** August 2003

Estimated Total ITS Funds: $786,000

Estimated Total Project Cost: $1,586,000

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 916-5972
Carlos Lopez	Texas DOT-Traffic Operations Division	(512) 416-3200
Thomas Urbanik, II	Texas Transportation Institute	(979) 845-8545

TRUCK SAFETY AND MONITORING WITHIN HOUSTON

Description:

This project is the FY 2000 ITS Integration Program earmark for Houston, Texas. Truck safety and monitoring are major concerns in the Houston area. Truck crashes and incidents in the Houston area have increased significantly in recent years. This project results from requests from the trucking industry and the Truck Safety Task Force. The project seeks to deploy and integrate ITS technologies in the corridors leading to and from the Port of Houston and other major destination points in the region.

The primary causes of truck accidents in the area have been attributed to truck driver unfamiliarity with the area, construction projects, and weather conditions aggravated by speeding. The project's concept is to deploy Dynamic Message Signs (DMS) at major points of entry to the corridors leading into the Houston District. These DMS would be integrated with the regional transportation management center-Houston TranStar. These signs would provide inbound traffic with advance notice of congestion, construction, flooding and similar conditions.

Trucks traveling at unsafe speeds will be identified and alerted by rollover warning devices flashing an immediate order to reduce speeds prior to negotiating interchange ramp. Additional components visualized in this project include Highway Advisory Radio advertised by lighted signs integrated into TranStar to enable activation during periods of roadway system blockages, and the deployment of kiosks at key locations outside of the Houston area. These kiosks would provide truck operators with information on traffic conditions, incidents and construction notices complemented by rerouting directions.

Project Location: Houston District (Brazoria, Fort Bend, Galveston, Harris, Montgomery and Waller Counties)

Partner(s): FHWA, Texas DOT, Metropolitan Transit Authority of Harris County, Harris County Sheriff Department, Houston Police Department

Start Date: June 2001

***End Date*:** December 2003

Estimated Total ITS Funds: $1,179,632

Estimated Total Project Cost: $2,359,264

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
John Gaynor	Texas DOT	(713) 881-3060

TUSCALOOSA, AL, TRAFFIC INTEGRATION AND FLOW CONTROL

Description: Tuscaloosa currently has an Advanced Traffic Management System that consists of a 20 mile fiber-optic trunk line, an integrated, multiple closed loop system, 20 CCTV cameras on major arterials, 2 Video Detection Systems, 7 video monitors and 40 controller upgrades and hubs. The system will be expanded to include 20 additional CCTV cameras, to extend 9 miles of fiber-optic cable, to install 11 dynamic message signs, and to expand the geographic information system to include traffic data and, via extended fiber-optic line, integrate the local Emergency Management System and incorporate real-time traffic congestion data. The infrastructure will connect fire, police, emergency management, ALDOT and AL State Troopers.

Project Location: Tuscaloosa, Alabama

Partner(s): Alabama DOT

Start Date: October 1998

***End Date*:** March 2003

Estimated Total ITS Funds: $2,200,000

Estimated Total Project Cost: $2,750,000

***Contacts*:**

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377	
Lewis Harden	FHWA Alabama Division, HDA-AL	(334) 223-7390	Ext. 230
David Griffin	Tuscaloosa Department of Transportation	(205) 349-0240	

WATT AVENUE TRANSIT PRIORITY AND MOBILITY ENHANCEMENT DEMONSTRATION

Description:

This project originated as the FY 2000 ITS Integration Program earmark for Sacramento County, California. The project has been phased in three consecutive increments corresponding to fiscal years 2000 through 2002.

The project is a multimodal, multi-jurisdicitonal operations activity which supports regional ITS deployment of several technologies. Project objectives include improved traffic and transit operations management, as well as enhanced regional institutional coordination between these functions and emergency service providers. The initial phase of this deployment funded a transit priority system which included remote positioning, passenger counting and signal priority providing buses priority at signalized intersections. Transit enhancements were complemented by multiple closed circuit TV camera installations along the Watt Avenue Corridor and a portion of a fiber optic trunkline. The second phase added dynamic message signs, additional CCTV cameras, and extended the fiber optic trunkline to meet an existing trunkline which provides center-to-center communication between the County Traffic Operations Center and the Caltrans Regional Transportation Management Center.

The FY 2002 earmark supports Light Rail Transit/bus dynamic signs enhancement, queue jumps, fiber optics extension, additional CCTV, Highway Advisory Radio, and Transportation Management Center upgrades and integration.

Funding figures reflect federal ITS funding for each FY in amounts as follows: FY 2000 - $786,421; FY 2001 - $1,091,220 and FY 2002 - $1,505,000.

Project Location: Sacramento, California

Partner(s): FTA, FHWA, Caltrans, Sacramento Regional Transit District, American River Fire District, California Highway Patrol

Start Date: September 2000

End Date: August 2003

Estimated Total ITS Funds: $3,382,220

Estimated Total Project Cost: $6,764,440

Contacts:

Frank Cechini	FHWA California Division, HTA-CA	(916) 498-5005
Doug Maas	Sacramento Public Works Agency	(916) 875-5545

WAUSAU-STEVENS POINT - WISCONSIN RAPIDS, WISCONSIN

Description:

This project is the FY 2000 ITS Integration Program earmark for Wausau-Stevens Point - Wisconsin Rapids, Wisconsin. Earmarked funding in the amount of $440,000 was approved in September 2002. The project is comprised of three separate sub-projects summarized below.

Sub-project #1. Statewide Traffic Management Software - This activity will develop a comprehensive, statewide traffic management system software package with an integrated communications network for the state. The software design will be modeled on the MONITOR Traffic Operations Center software currently operational in Milwaukee, WI. The software design will be flexible and expandable to accommodate the requirements of the eight transportation districts throughout the state. The software deployment will link WisDOT with the Wisconsin State Patrol, local agencies, emergency medical systems and maintenance organizations. The estimated cost of this sub-project is $275,000.

Sub-project #2. Environmental Sensor Stations for the I-39 Corridor - This activity will deploy four additional road weather information system (RWIS) environmental sensor stations (ESS) along the rural I-39 corridor. These four additional RWIS ESS units will increase the amount of data currently available to county maintenance crews. The ESS will be located at the roadside with pavement condition sensors extending from the ESS to the road surface. Enhanced RWIS stations have cameras on top of the unit. The closed circuit TV cameras mounted on the RWIS stations enable accurate visual detection, and assist in identifying the type and intensity of precipitation. The total estimated cost of this sub-project is $220,000 of which $110,000 is comprised of earmarked funds.

Sub-project #3. Evaluation of the Wausau-Stevens Point-Wisconsin Rapids, WI I-39 Corridor Implementation Projects - This activity will consist of a self-administered evaluation of the implementation projects identified above. The evaluation will conduct impact assessments of the deployment/integration projects, and address cost-effectiveness. The estimated total cost of this effort is $110,000 of which $55,000 is comprised of earmarked funding.

Project Location: Wausau-Stevens Point-Wisconsin Rapids, Wisconsin

Partner(s): FHWA; Wisconsin DOT (Wis DOT); Counties of Columbia, Lincoln, Marathon, Marquette, Portage, Vilas, Waupaca, Waushara, Wood, Dane; Wisconsin State Patrol; Cities of Merrill, Stevens Point, Wausau

Start Date: September 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $440,000

Estimated Total Project Cost: $880,000

Contacts:

John Berg	FHWA Wisconsin Division, HDA-WI	(608) 829-7515
Phil De Cabooter	Wisconsin DOT	(602) 267-0452

WHATCOM REGIONAL ITS FIBER OPTIC INTEGRATION

Description: This project is the FY 2001 ITS Integration Program earmark for Bellingham, WA. The project objective is to complete critical fiber optic communication links between Bellingham's existing Traffic Management Center (TMC) and all currently deployed ITS components operated by adjacent agencies in the Whatcom region. The project scope includes acquisition of fiber optic equipment on ITS software required to integrate the various ITS subsystems enabling a unified medium for information exchange. Anticipated benefits of this integration range from enhancement of single agency systems to interoperability among operational systems in the greater metropolitan area. On a more regional scale, the integration of multi-agency resources will enable Bellingham's TMC to serve as an information hub to help facilitate transportation public safety programs such as airport and border crossing traveler information, state and local dynamic message signs, highway advisory radio, and roadway weather information systems, as well as multi-agency signal timing plans.

Project Location: Bellingham, Washington

Partner(s): FHWA, Washington State DOT, Whatcom County, WCOG, City of Bellingham, Bellingham Fire Department, Port of Bellingham

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $277,765

Estimated Total Project Cost: $555,530

***Contacts*:**

Michael Brower	FHWA Washington Division, HPM-WA	(360) 753-9550	
Clark Alan Williams	City of Bellingham	(360) 733-7169	Ext. 105

WORK ZONE VIDEO INTEGRATION

Description:

This project is a component of the FY 2000 ITS Integration Program State of Nebraska earmark. As part of the Midwest States Smart Work Zones Deployment Initiative, the Nebraska Department of Roads (NDOR), in cooperation with the Nebraska State Patrol (NSP) and the City of Omaha, will deploy a speed advisory system at a work zone on the freeway system in Omaha. The system will provide real-time speed advisory information to drivers by means of portable dynamic message signs (DMS) strategically located in advance of diversion points upstream of the work zone so that drivers will be able to divert to an alternate route when there is congestion in the work zone. The system will use video detection to measure the speed of traffic in advance of the work zone. The average traffic speed will be displayed on portable DMSs. When necessary, NDOR will be able to over-ride the system and display incident-related messages on the portable DMSs. The FY 2000 Work Zone Video Integration Project will integrate the video data from the speed advisory system with the Mid-America Transportation Center (MATC) Web page, which will be linked to the NDOR and other traveler information Web sites.

The goal of the video integration is to enhance the traveler information and incident management components of the system by facilitating the dissemination of information regarding traffic conditions in the work zone to commuters, transportation service providers and other users.

Project Location: Omaha, Nebraska

Partner(s): FHWA, Nebraska Dept. of Roads, Nebraska State Patrol, City of Omaha

Start Date: August 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $15,000

Estimated Total Project Cost: $15,000

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977

Special Purpose

NASHVILLE, TENNESSEE TRAFFIC AND PARKING GUIDANCE SYSTEM

Description: This multiple phase comprehensive parking and traffic management system will utilize: traffic sensors, signals, electronic and static signs, communications devices, data processing hardware and software, and data display equipment. Implementation of this planned system will make parking facilities in Nashville easier to use and less disruptive for traffic both in the Central Business District (CBD) and approaching routes into and out of the area.

Project Location: Nashville, TN

Partner(s): Tennessee DOT and Nashville Dept. of Public Works

Start Date: August 1997

***End Date*:** December 2003

Estimated Total ITS Funds: $1,750,000

Estimated Total Project Cost: $2,187,500

***Contacts*:**

Michael Smart	FHWA Tennessee Division, HDA-TN	(615) 781-5775
Mark Macy	Nashville Dept. of Public Works	(615) 862-8760

Completed Projects

ADA COUNTY TRAVEL DEMAND MANAGEMENT EMISSIONS DETECTION

Description: The primary objective of this test was to evaluate the feasibility of using remote sensing technology to monitor vehicle emissions. Active infra-red roadside emissions detection technology was used to determine the relative contributions of in-county and out-of-county vehicles to mobile-source emissions.

Project Location: Ada County - Boise, Idaho

Partner(s): Idaho DOT, Ada Planning Association, and Ada Air Quality Board

Start Date: August 1994

***End Date*:** April 1996

Estimated Total ITS Funds: $253,000

Estimated Total Project Cost: $319,000

***Contacts*:**

Ross Blanchard	FHWA Idaho Division, HRD-ID	(208) 334-9180
Erv Olen	Ada Planning Association	(208) 345-5374

ADDITIONAL PROTOTYPE DEVELOPMENT (RT-TRACS)

Description: This study focused on the development of four additional real-time traffic adaptive signal control (RT-TRACS) prototypes which, together with the prototype developed under the ongoing RT-TRACS study, was evaluated under a subsequent study which was completed in December 1998. (See: Evaluation of Real-Time Traffic Adaptive Signal Control Prototypes)

Project Location: See Contractors

Contractor(s): University of Minnesota, Miami Valley Research Institute, University of Maryland, and University of Arizona

Start Date: May 1994

***End Date*:** December 1996

Estimated Total ITS Funds: $1,680,000

Estimated Total Project Cost: $1,680,000

***Contacts*:**

Deborah Curtis	FHWA - TFHRC, HRDO-03	(202) 493-3267

ADVANCE

Description:

ADVANCE (Advanced Driver and Vehicle Advisory Navigation Concept) was a cooperative effort to evaluate the performance of a large-scale in-vehicle navigation and dynamic route guidance system. Initially, 3,000 private, commercial and public agency vehicles in the northwestern suburbs of Chicago were scheduled to be equipped with in-vehicle navigation and dynamic route guidance systems. Early in FY 1995, the partnership became concerned with issues that surfaced involving development of the system and the status of the overall in-vehicle navigation and dynamic route guidance system market in this country. The issues were further refined and quantified and several deployment options were developed and evaluated. The Steering Committee at a meeting in late February 1995, unanimously approved the recommended targeted deployment option. A significant portion of the original project goals and objectives were met under targeted deployment. This option allowed for limited, specific testing of the in-vehicle navigation and dynamic route guidance system in a controlled environment at a significantly lower budget. Based on revised project goals and objectives, in-vehicle testing for the targeted deployment phase was completed in December 1995 using approximately 75 vehicles; 32 of these vehicles (project vehicles) were deployed for testing and evaluation. Eighty local households participated in a test of the system and their reactions were favorable. Vehicles served as probes, providing real-time traffic information to a Traffic Information Center (TIC). This information was processed and transmitted to the equipped vehicles and used to develop preferred routes. The routing information was presented to the driver in the form of dynamic routing instructions. An evaluation plan for ADVANCE based on targeted deployment was developed, adopted, and implemented. The evaluation was completed and the results were made available to the general public in January 1997. The Steering Committee also concurred in the further development and modification of the ADVANCE TIC (application phase of ADVANCE) so it can serve as the Corridor Transportation Information Center (C-TIC) for information dissemination efforts for the Gary-Chicago-Milwaukee (GCM) ITS Priority Corridor.

Project Location:

Northwest suburbs of Chicago, Illinois

Partner(s):

Illinois DOT, Motorola Inc., Illinois Universities Transportation Research Consortium (IUTRC), American Automobile Association (AAA)

Start Date:

July 1991

***End Date*:**

December 1996

Estimated Total ITS Funds:

$10,934,346

Estimated Total Project Cost:

$11,542,933

***Contacts*:**

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
Dave Zavattero	Illinois DOT	(847) 705-4800

ALTERNATE BUS ROUTING

Description: The Alternate Bus Route Project was a pilot evaluation of next generation Vehicle-to-Roadside Communications (VRC). The first phase utilized 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.

Project Location: Garden State Parkway, New Jersey

Partner(s): New Jersey DOT, New Jersey Highway Authority, Transportation Operations Coordinating Committee (TRANSCOM), and Hughes Transportation Management Systems

Start Date: August 1993

***End Date*:** May 1998

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $1,027,253

***Contacts*:**

Keith Sinclair	FHWA New Jersey, HTC-NJ	(609) 637-4204
Richard Rash	New Jersey Highway Authority	(908) 442-8600

ANALYSIS OF TRAVELERS' PREFERENCES FOR ROUTING

Description:

One strategy for using the roadway effectively is to provide traffic status information to assist travelers' route planning and scheduling. This expanded knowledge of options for departure time and route choice and rerouting will create a more effective use of the roadway infrastructure.

It is important for message providers to know what kinds of message content and formats are sufficiently convincing to influence traveler decision making. One purpose of this project was to identify factors which influence decision criteria for departure times, routing and rerouting decisions particularly in commuting situations.

This project provided empirically derived results bearing on these issues in at least two forms. One form was a human factors handbook which furnishes guidance for the design and transmission of messages primarily for Advanced Traveler Information Systems. Empirical results were also used in the development of realistic estimates of driver behavior needed for traffic models.

Project Location: Maryland

Contractor(s): Westat Corporation

Start Date: May 1995

***End Date*:** September 2000

Estimated Total ITS Funds: $1,311,494

Estimated Total Project Cost: $1,311,494

***Contacts*:**

Joe Moyer	FHWA - TFHRC, HRDS-07	(202) 493-3370

ANN ARBOR SMART INTERMODAL

Description: This project supported 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 allows control of on-board electronics, such as the fare collection system, destination sign and enunciator. The on-board system also enables buses to interact with traffic signal preemption devices and to communicate with the central control system. The central control system integrates the data from the bus fleet for coordinated supervision, and also provides real-time transit information to the public. The "Smart Card" fare system provides a dual farecard/parking pass to encourage auto drivers to ride transit by providing them with an easy, cost-saving method for fare payment.

Project Location: Ann Arbor Transit Authority, Michigan

Partner(s): City of Ann Arbor and University of Michigan

Start Date: January 1994

***End Date*:** November 1999

Estimated Total ITS Funds: $303,000

Estimated Total Project Cost: $2,442,500

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678
Bill Hiller	Ann Arbor Transportation Authority (AATA)	(313) 973-6500

APTS TECHNOLOGY RESEARCH

Description: Under this project, various new technologies were evaluated for their potential benefit to transit and studies were performed to support and facilitate the application of the technologies to public transportation. Studies performed addressed transit system architecture requirements, human factors issues, frequency spectrum requirements and allocations, multi-modal fare/toll payment smart cards, automatic vehicle monitoring and management system implementations, and map and spatial database requirements. This technical support included research and technical assistance to transit authorities implementing APTS technologies.

Project Location: Cambridge, Massachusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: March 1995

***End Date*:** October 1998

Estimated Total ITS Funds: $585,000

Estimated Total Project Cost: $585,000

***Contacts*:**

Ron Boenau	FTA Headquarters,TRI-11	(202) 366-0195
Robert S. Ow	Volpe National Transportation Systems Center	(617) 494-2411

ATLANTA ATIS-KIOSK PROJECT

Description: The Atlanta Traveler Information Kiosk project focuses on Traveler Information statewide. The project provides Traveler Information at a variety of locations including rest areas, welcome centers, shopping, employment, and lodging centers. The Kiosks are operated by Georgia Net, a Georgia state authority responsible for dissemination of various types of information. The evaluation for the project was led by Oak Ridge National Laboratory, along with the Georgia Institute of Technology, Clark-Atlanta University, and Concord Associates. A User Acceptance Test Report was produced by the evaluators. A network of 130 statewide deployed kiosks provide real-time traveler information including incident and congestion information, route planning, transit information, and more.

Project Location: Georgia, statewide with a concentration in the Atlanta Metropolitan Area

Partner(s): Georgia DOT, Georgia Net, and other private sponsors

Start Date: March 1994

***End Date*:** January 1999

Estimated Total ITS Funds: $4,000,000

Estimated Total Project Cost: $5,000,000

***Contacts*:**

Mshadoni Smith	FHWA Georgia Division, HDA-GA	(404) 562-3638

ATLANTA DRIVER ADVISORY SYSTEM (ADAS)

Description: The primary objective of this test was to evaluate the benefits of en-route traveler advisory and traveler services information using FM subcarrier wide area communications systems and applications of the 220 MHz frequency pairs. The evaluators of the field operational test produced a system performance test report for the project.

Project Location: Atlanta, Georgia

Partner(s): Scientific-Atlanta, Federal Express, TRW, Concord Associates, Georgia Tech Research Institute, Georgia Tech., Clark Atlanta University, Georgia DOT, and Oak Ridge National Laboratory

Start Date: March 1995

***End Date*:** September 1997

Estimated Total ITS Funds: $7,236,916

Estimated Total Project Cost: $8,557,116

***Contacts*:**

Mshadoni Smith	FHWA Georgia Division, HDA-GA	(404) 562-3638
Karl Betz	Scientific Atlanta	(404) 903-2380

ATLANTA TRAVELER INFORMATION SHOWCASE

Description: The Atlanta Traveler Information System (TIS) project provides timely transportation information to travelers in the Atlanta metropolitan area through the use of Personal Communication Devices (PCDs), in-vehicle navigation devices, on-line computer information services, interactive television in selected hotels, and cable television. This information is available to both residents and visitors for trip planning purposes. The project was operational before, during, and after the 1996 Summer Olympic and Paralympic Games. The TIS includes information on multimodal travel options, including bus, rail and air travel. The TIS also includes an extensive public information campaign. The Showcase project successfully transferred all of the devices to the Georgia DOT for incorporation as legacy devices in the Statewide ITS. The Personal Communication Devices and the in-vehicle navigation devices are the only devices that are currently not being supported.

Project Location: Atlanta, Georgia

Partner(s): Battelle, Georgia DOT, and MARTA

Start Date: February 1995

***End Date*:** March 1997

Estimated Total ITS Funds: $14,219,577

Estimated Total Project Cost: $14,219,577

***Contacts*:**

Mshadoni Smith	FHWA Georgia Division, HDA-GA	(404) 562-3638

ATMS RESEARCH ANALYSIS DATABASE SYSTEM

Description:

The objective of this effort was to develop a means of integrating disparate traffic engineering tools through the use of a common data dictionary and database system. The set of software tools that could use this system include ATMS research software and traffic engineering analysis tools. This effort concentrated on developing the data dictionary, building a database designed around that dictionary, and modifying a small number of existing programs to use that database system.

The proposed system, the ATMS Research Analysis Database System (ATMS RADS), provides a standard data dictionary to be used for storage and retrieval of data used by ATMS and traffic engineering software. This project also uses a proof-of-concept development to demonstrate that this standard data dictionary and database system are useful to a variety of existing programs.

Project Location: Rome, New York

Contractor(s): USAF Rome Laboratory

Start Date: March 1997

***End Date*:** September 2000

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Gene McHale	FHWA - TFHRC, HRDO-03	(202) 493-3275

BALTIMORE-WASHINGTON CORRIDOR: SURVEILLANCE INFRASTRUCTURE IMPLEMENTATION

Description: The Baltimore Washington Corridor Surveillance Infrastructure Project consists of CCTV cameras, overhead mounted radar, and the communications required to take the equipment from the roadway to Maryland State Highway Administration's Statewide Operations Center to provide real-time traffic data. The overhead mounted radar is used for roadway speed monitoring and not for enforcement purposes. The infrastructure installation is on I-695, I-495, I-595, I-395, I-70, I-95, I-83, and I-270 in Maryland to provide MD State Highway Administration statewide operations center with real-time traffic data.

Project Location: Maryland

Partner(s): Maryland State Highway Administration

Start Date: January 1993

***End Date*:** February 1996

Estimated Total ITS Funds: $2,200,000

Estimated Total Project Cost: $2,750,000

***Contacts*:**

Breck Jeffers	FHWA Maryland Division HB-MD	(410) 962-4342	Ext. 129
Mike Zezeski	Maryland State Highway Administration	(410) 787-5859	

BARBOURSVILLE-ONA, WEST VIRGINIA TRAFFIC MANAGEMENT

Description: This project consisted of improving access to and from the Huntington Mall and other properties located along US Route 60 and Mail Road (Cabell Co. 60/89). The Huntington Mall Road is a heavily traveled road with a 1995 Average Daily Traffic of 23,600 vehicles weekdays and 40,000 vehicles per weekend. The Huntington Mall Road begins at US Route 60 as a three-lane roadway and proceeds north under the I-64 bridge where it becomes a five-lane roadway section with four lanes northbound and one lane southbound. Immediately north of the westbound entrance ramp and the westbound exit ramp intersections, the road consists of seven lanes with five lanes northbound and two lanes southbound.

Project Location: Barboursville-ONA, West Virginia

Partner(s): West Virginia DOT

Start Date: October 1998

***End Date*:** November 1999

Estimated Total ITS Funds: $8,000,000

Estimated Total Project Cost: $11,210,842

***Contacts*:**

Greg Morris	FHWA West Virginia Division	(304) 347-5473
Dave Bodnar	West Virginia Department of Highways	(304) 558-2885

BETA TESTING OF SOFTWARE

Description: This activity allows practitioners to assess the integrity and applicability of newly modified or developed FHWA software. This allows FHWA to better match user needs, thereby reducing the time needed to bring traffic engineering software to the market-ready stage.

Project Location: Gainesville, Florida

Contractor(s): University of Florida

Start Date: September 1994

***End Date*:** February 2000

Estimated Total ITS Funds: $521,221

Estimated Total Project Cost: $551,650

***Contacts*:**

Henry Lieu	FHWA - TFHRC, HRDO-03	(202) 493-3273

BORMAN EXPRESSWAY ADVANCED TRAFFIC MANAGEMENT SYSTEM (ATMS) PHASE I

Description: INDOT, in conjunction with Hughes Transportation Systems, JHK, and Avilla, developed and installed a functioning prototype Advanced Traffic Management System (ATMS) deploying several of the more promising electronic sensors and integrating them into the prototype using spread spectrum radio communications. The equipment was 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 has become an essential component of the Gary-Chicago-Milwaukee, Midwest ITS Priority Corridor.

Project Location: The Borman ATMS is a part of the Gary-Chicago-Milwaukee, Midwest ITS Priority Corridor

Partner(s): FHWA, Indiana DOT

Start Date: July 1994

***End Date*:** December 1996

Estimated Total ITS Funds: $550,000

Estimated Total Project Cost: $1,750,000

***Contacts*:**

Dennis Lee	FHWA, Indiana Division HDA-IN	(317) 226-5351
Dan Shamo	Indiana DOT	(219) 362-6125

BOSTON SMARTRAVELER

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 is available. The project has moved beyond operational testing using other funds.

Project Location: Boston, Massachusetts

Partner(s): Project contributors include the Massachusetts Highway Department, SmartRoute Systems. Several local radio and television stations donated advertising and promotion for the project

Start Date: September 1992

***End Date*:** December 1994

Estimated Total ITS Funds: $1,515,000

Estimated Total Project Cost: $3,395,000

***Contacts*:**

Edward Silva	FHWA Massachusetts Division, HDA-MA	(617) 494-2253
Michelle Boucher	Massachusetts Highway Department	(617) 973-7315

BUFFALO/NIAGARA FALLS ATMS

Description: This project provides for a variety of travel management enhancements to include: installation of a road weather information system and variable message signs; establishment of a weather advisory for a local bridge; an enhanced traffic operation center computer system; and freeway management capability in the Buffalo area. This was the first of several planned phases to establish a complete freeway management system in the Buffalo/Niagara Falls area.

Project Location: Buffalo, New York

Partner(s): New York State DOT

Start Date: May 1995

***End Date*:** March 1998

Estimated Total ITS Funds: $2,000,000

Estimated Total Project Cost: $2,791,286

***Contacts*:**

Jerry Zell	FHWA New York Division, HTS-NY	(518) 431-4125	Ext. 228
Dean Gustafson	New York State DOT	(716) 847-2450	

CALIFORNIA SMART TRAVELER

Description: This project was comprised of two components: (a) Los Angeles Smart Card, and (b) Orange County Smart Intermodal System. The Los Angeles Smart Card tested the use of smart cards for express transit services as well as for parking and other services at employment sites. Two different card technologies were tested: a contact card and a radio frequency (RF) proximity card. The Orange County Smart Intermodal System operationally tested (1) an integrated transit and traffic management system and (2) a real-time information system that included special event information.

Project Location: Los Angeles and Orange County, California

Partner(s): Los Angeles Metropolitan Transportation Authority (LAMTA), Volpe National Transportation Systems Center, Aegis Transportation Information Systems, Inc., Merced County Council of Government, University of California, and California DOT (Caltrans)

Start Date: September 1992

***End Date*:** December 1994

Estimated Total ITS Funds: $1,520,000

Estimated Total Project Cost: $3,290,000

***Contacts*:**

Ron Boenau	FTA Headquarters, TRI-11	(202) 366-0185
Cliff Loveland	CalTrans	(916) 654-9970

CAPITAL: WASHINGTON, D.C. AREA OPERATIONAL TEST

Description: This ITS Operational Test made extensive use of the existing cellular infrastructure for both areawide surveillance and communications. Engineering Research Associates (ERA) equipment was collocated on Bell Atlantic Mobile towers to detect cellular usage and geolocate phones on designated roadways. Specific evaluation goals included determination of the accuracy of geolocation data; the accuracy and completeness of traffic information; the usefulness of passive statistical processing for measuring volume and incidents; the criteria for selecting roadways that can be monitored by these techniques; system capabilities; costs for deployment; public acceptance; and the usefulness of information dissemination to fleet vehicles.

Project Location: Washington, District of Columbia Metropolitan area

Partner(s): Virginia DOT and Maryland State Highway Administration, Raytheon E Systems, Bell Atlantic NYNEX Mobile, and PB Farradyne

Start Date: August 1993

***End Date*:** June 1997

Estimated Total ITS Funds: $5,531,733

Estimated Total Project Cost: $7,229,418

***Contacts*:**

Charles Hall	Virginia DOT	(804) 786-6777
Glenn McLaughlin	Maryland State Highway Administration	(410) 787-5872
Bob Ewald	Engineering Research Associates	(703) 208-1211

CARAT

Description: The Congestion Avoidance and Reduction for Automobiles and Trucks (CARAT) project was a long-range, comprehensive implementation of a congestion management project for freeways and connected arterials in the Charlotte urban area. The ITS project focused on the design/build/warrant (D/B/W) procurement process in the CARAT project.

Project Location: Charlotte, North Carolina

Partner(s): North Carolina DOT, City of Charlotte, University of North Carolina System

Start Date: June 1992

***End Date*:** December 2000

Estimated Total ITS Funds: $10,990,000

Estimated Total Project Cost: $16,367,300

***Contacts*:**

Max Tate	FHWA North Carolina Division, HDA-NC	(919) 856-4354
Roberto Canales	North Carolina DOT	(919) 250-4159

CHART STRATEGIC PLAN - MARYLAND

Description: This study developed a strategic plan for statewide deployment of ITS. CHART is Maryland's statewide transportation management program. This specific study developed a CHART strategic plan. Two areas that received emphasis are traffic management strategies and communications alternatives. The effort initially concentrated on congestion management in the Baltimore-Washington corridor. Both current and future needs were evaluated, including the application of ITS technologies and services. This project also provides for CHART systems integration using Congestion Mitigation Funds.

Project Location: Maryland

Partner(s): FHWA, Maryland State Highway Administration

Start Date: December 1992

***End Date*:** May 1996

Estimated Total ITS Funds: $300,000

Estimated Total Project Cost: $2,245,000

***Contacts*:**

Breck Jeffers	FHWA Maryland Division HB-MD	(410) 962-4342	Ext. 129
Mike Zezeski	Maryland State Highway Administration	(410) 787-5859	

CONNECTICUT FREEWAY ADVANCED TRAFFIC MANAGEMENT SYSTEMS (ATMS)

Description: This ATMS project evaluated 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.

Project Location: Hartford, Connecticut: I-91 and I-84 in the Hartford region

Partner(s): FHWA, Connecticut DOT

Start Date: December 1991

***End Date*:** December 1996

Estimated Total ITS Funds: $600,000

Estimated Total Project Cost: $1,380,000

***Contacts*:**

Bob Ramirez	FHWA Connecticut Division, HDA-CT	(860) 659-6703	Ext. 3004
James Mona	Connecticut DOT	(860) 594-3450	

DADE COUNTY EXPRESSWAY, FLORIDA TOLL COLLECTION SYSTEM

Description: This project is designed to provide electronic toll collection services on the Dade County Expressway. The project is comprised of a Federal ITS component and a component funded by other sources. While the entire project remains in progress, the Federal ITS portion has been completed.

Project Location: Miami, Florida

Partner(s): FHWA, Miami-Dade County Expressway Authority

Start Date: October 1998

***End Date*:** September 2000

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $81,000,000

***Contacts*:**

Chung Tran	FHWA Florida Division, HDA-FL	(850) 942-9650	Ext. 3041
Sam Gonzales	Miami-Dade Expressway Authority	(305) 637-3277	

DATABASES FOR ASSESSMENT OF OPERATIONAL TESTS AND TRAFFIC MODELS

Description: This study involved defining data required for the validation and verification of traffic models. This study also included the collection and storage of traffic data from different sites strategically selected around the country and the subsequent maintenance of the databases. Additionally, issues were addressed including type of storage needed (central vs. distributed), hardware and software platforms, and user interfaces (pre - and post-processing activities). Some of these data were obtained from existing data sources or on-going ITS field operational tests. Special emphasis was placed on data collection from the field testing of Adaptive Control Systems. The verification and validation techniques and database management system was applied to FHWA's TRAF family of models. The development of the Traffic Software Integrated System version 5.0 was completed and technical support for the ATMS R&D programs was provided.

Project Location: Colorado Springs, Colorado

Contractor(s): ITT Systems

Start Date: June 1995

***End Date*:** September 2002

Estimated Total ITS Funds: $2,790,056

Estimated Total Project Cost: $2,790,056

***Contacts*:**

Gene McHale	FHWA - TFHRC, HRDO-03	(202) 493-3275

DELAWARE COUNTY RIDETRACKING

Description: This project developed and evaluated an automated identification and billing system (AIBS) for paratransit service. The AIBS automates 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, resulted in system efficiency and cost saving.

Project Location: Delaware County, Pennsylvania

Partner(s): EG&G Dynatrend

Start Date: June 1994

***End Date*:** July 1998

Estimated Total ITS Funds: $200,000

Estimated Total Project Cost: $200,000

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678
Judy McGrane	Community Transit	(610) 532-2900

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

Description:

This project utilizes the data gathered from the Automatic Vehicle Locator (AVL) system, currently 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.

The project was approved with limited funding as compared to the original proposal, therefore original evaluation objectives were revised.

Project Location: Denver, Colorado

Partner(s): Colorado DOT, Transportation Management Solutions, and Denver RTD

Start Date: September 1993

***End Date*:** September 1999

Estimated Total ITS Funds: $8,000,000

Estimated Total Project Cost: $10,500,000

***Contacts*:**

W. Raymond Keng	FTA Headquarters, TRI-11	(202) 366-6667
Dave Shelley	Denver Rapid Transit	(303) 299-2408

DETECTION TECHNOLOGY FOR ITS

Description: This contract developed functional and performance specifications for permanently deployed and portable vehicle detectors in ITS applications. Candidate vehicle detector technologies were 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 did not meet ITS specifications. In these cases, functional requirements were developed for the detectors. Another part of the study dealt with determining if a permanent national vehicle detector test facility is needed to provide vehicle detector test data for future commercial vehicle detectors used in ITS. The executive summary for this project can be found on the internet at www.tfhrc.gov.

Project Location: Fullerton, California

Contractor(s): Hughes Ground Systems Group

Start Date: September 1991

***End Date*:** September 1996

Estimated Total ITS Funds: $1,777,000

Estimated Total Project Cost: $1,777,000

***Contacts*:**

Milton Mills	FHWA - TFHRC, HRDO-06	(202) 493-3338

DETROIT TRANSPORTATION CENTER TRANSIT INFORMATION

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

Project Location: Detroit, Michigan

Partner(s): FTA, FHWA, City of Detroit and Michigan DOT

Start Date: December 1993

***End Date*:** April 1995

Estimated Total ITS Funds: $50,000

Estimated Total Project Cost: $100,000

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678

DETROIT, MICHIGAN AREAWIDE DEPLOYMENT OF ATMS/ATIS

Description: The Michigan DOT has completed a comprehensive ATMS/ATIS Early Deployment Plan for expansion of the existing 32.5 miles of instrumented freeway coverage to 250 miles in Metropolitan Detroit. The deployment undertaken in Phase One has expanded the system coverage by 150 miles, and provides the Michigan Intelligent Transportation Systems (MITS) Center in Detroit with the capability to monitor traffic and congestion through the use of mainline traffic detectors (loops and machine vision), ramp metering and video surveillance. Traveler information is provided via highway advisory radios and changeable message signs. The implementation of the ATMS/ATIS system provides the Michigan DOT the means to detect and verify incidents on selected corridors in a timely manner, to provide traffic operations personnel sufficient data to respond to incidents and to disseminate traffic and congestion information to motorists so they can plan or modify their travel plans. Additionally, the system has the capability to manage mainline work zones, calculate mainline volume demand and predict traffic flow patterns for special events, planned work/construction zones, and other special events. The corridors which were deployed include selected segments of Interstates 75, 94, 96 and 696, and the M-10 and M-39 freeways.

Project Location: Detroit, Michigan metropolitan area

Partner(s): Michigan DOT, Road Commission for Oakland County

Start Date: June 1994

***End Date*:** October 1998

Estimated Total ITS Funds: $3,000,000

Estimated Total Project Cost: $33,389,353

***Contacts*:**

Morrie Hoevel	FHWA Michigan Division, HDA-MI	(517) 702-1834
Dr. Kunwar Rajendra	Michigan DOT	(517) 373-2247

DIRECT

Description:

DIRECT (Driver Information Radio using Experimental Communication Technologies) was an Operational Field Test that deployed and evaluated several alternative low-cost methods of communicating advisory information to motorists. These included use of the Radio Broadcast Data System (RBDS)/FM subcarrier (SCA), Automatic Highway Advisory Radio (AHAR), Low Power Highway Advisory Radio (HAR), and cellular phones. The Michigan Intelligent Transportation Systems (MITS) Center collected traffic information from various sources, fused the information and provided traffic advisory updates to travelers on an exception basis. Initial experimental testing involved 30 specially-equipped vehicles.

Approval for a phase II of this project was granted with no additional Federal funding. In phase II, Michigan DOT and the University of Michigan formed a partnership to leverage residual Federal funding to field test the potential for using RDS entertainment radio for both emergency warnings from speeding emergency vehicles or in-line maintenance vehicles via the Emergency Radio Data System, and for delivering trip-specific traffic alerts of incidents from the Traffic Management Center. Phase II of this project commenced in FY 2000, and was called DIRECT - Phase II.

Project Location: Along sections of I-75 and I-94 in the Detroit, Michigan area

Partner(s): FHWA, Michigan DOT, Ford, Delco, Ericsson/GE, AAA of Michigan, Ameritech, Metro Networks, University of Michigan, Capstone Consulting, ERIM

Start Date: January 1994

***End Date*:** April 1999

Estimated Total ITS Funds: $2,500,000

Estimated Total Project Cost: $4,500,000

***Contacts*:**

Chung Eng	FHWA Headquarters, HOTM	(202) 366-6066
Morrie Hoevel	FHWA Michigan Division, HDA-MI	(517) 702-1834
Kunwar Rajendra	Michigan DOT	(517) 335-2893

EVALUATING ENVIRONMENTAL IMPACTS OF ITS USING LIDAR

Description: This test combined Light Detection and Ranging (LIDAR) technology for wide area emissions detection with active infrared technology for roadside emissions detection to evaluate changes in air quality due to implementing traffic responsive control strategies for events at a sports complex. The objectives were to: (1) measure the effect of MnDOT's Portable Traffic Management System on air quality, (2) determine the ability of LIDAR technology to provide quantitative and qualitative air quality data, and (3) assess the overall effectiveness of LIDAR as an evaluation tool.

Project Location: Minneapolis and St. Paul, Minnesota

Partner(s): FHWA, Minnesota DOT, Santa Fe Technologies, Loral Federal Systems, and University of Minnesota

Start Date: July 1994

***End Date*:** June 1997

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $766,847

***Contacts*:**

Jim McCarthy	FHWA Minnesota Division, HDA-MN	(651) 291-6112
Marthand Nookala	Minnesota DOT	(651) 296-8567

EVALUATION OF REAL-TIME TRAFFIC ADAPTIVE SIGNAL CONTROL PROTOTYPES

Description: This study focused on the evaluation of five real-time traffic adaptive signal control prototypes previously developed. The evaluation consists of three phases: conceptual evaluation, laboratory evaluation, and field evaluation. The conceptual evaluation established the validity of the prototypes' overall concept. The laboratory evaluation tested each prototype in a simulated environment against an optimal baseline case study. Various scenarios were evaluated including a high type arterial, a small grid network, a complex grid network, and a cluster network. The field evaluation implemented and evaluated a promising prototype strategy within the overall Real-Time Traffic Adaptive Control System.

Project Location: Colorado Springs, Colorado

Contractor(s): ITT Systems and Sciences

Start Date: January 1995

***End Date*:** December 1998

Estimated Total ITS Funds: $1,796,400

Estimated Total Project Cost: $1,796,400

***Contacts*:**

Deborah Curtis	FHWA - TFHRC, HRDO-03	(202) 493-3267

FM/SCA PROTOTYPE FOR TRAFFIC INFORMATION BROADCAST

Description: This project involved the test and evaluation by an industry organization of the prototype Subsidiary Communications Authorization (SCA) Traffic Information Channel (STIC) waveform. A system based on this waveform will allow a commercial FM broadcast station's subcarrier 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. The equipment, developed by Mitretek Systems, under contract to FHWA over the last several years, was built to meet the specific requirements of ITS, but has application for other data broadcast scenarios.

Project Location: Washington, DC

Contractor(s): Electronic Industries Association

Start Date: September 1993

***End Date*:** December 1997

Estimated Total ITS Funds: $50,000

Estimated Total Project Cost: $50,000

***Contacts*:**

Gene McHale	FHWA - TFHRC, HRDO-03	(202) 493-3275

FUEL CONSUMPTION AND EMISSION VALUES FOR TRAFFIC MODELS

Description: The Oak Ridge National Laboratory (ORNL) developed a database of on-road fuel consumption and emissions for eight late model vehicles, as a function of vehicle speed and acceleration. These vehicle "maps" were developed for use in simulation models that evaluate strategies to enhance roadway design, traffic control, and ITS concepts. The maps permit simulation models to calculate the energy and emission impacts of highway traffic improvements.

Project Location: Oak Ridge, Tennessee

Contractor(s): Oak Ridge National Laboratory

Start Date: June 1993

***End Date*:** September 1998

Estimated Total ITS Funds: $1,300,000

Estimated Total Project Cost: $1,300,000

***Contacts*:**

Aladdin Barkawi	FHWA - TFHRC, HRDO-03	(202) 493-3270

GENESIS

Description: Genesis is an advanced traveler information system (ATIS) that uses personal communications devices (PCDs) to distribute information. Timely delivery means gathering the data in real-time and distributing the data to travelers when they need it, where they need it and how they need it. Genesis is an element in the Minnesota Guidestar ITS program. With transit and traffic data, Genesis is able to provide the urban traveler with current data relevant to a chosen trip mode and route. The Genesis PCD is portable and transit information is fully accessible to the user.

Project Location: Minneapolis/St. Paul, Minnesota

Partner(s): Minnesota DOT, Motorola Center for Transportation Studies, University of Minnesota

Start Date: September 1992

***End Date*:** October 1997

Estimated Total ITS Funds: $4,069,000

Estimated Total Project Cost: $5,666,000

***Contacts*:**

Jim McCarthy	FHWA Minnesota Division, HDA-MN	(651) 291-6112
Ray Starr	Minnesota DOT	(651) 582-1359

GIS APPLICATIONS AND TECHNICAL SUPPORT

Description: This project developed Geographic Information System (GIS) applications and provided technical support for implementation of the National Transit GIS. Coding was provided for fixed guideway facilities including heavy rail, light rail and people movers. Equipment has been purchased in this project to accomplish the work. Outreach activities included information booth displays and brochures.

Project Location: Cambridge, Massachusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: March 1995

***End Date*:** December 1995

Estimated Total ITS Funds: $600,000

Estimated Total Project Cost: $600,000

***Contacts*:**

William Wiggins	FTA Headquarters, TRI-11	(202) 366-0915

GOLDEN GLADES INTERCHANGE

Description: This project resulted in the deployment of advanced traffic management technologies. The State of Florida installed advanced traffic management technologies at the Golden Glades Interchange on Interstate 95 in Dade County, Florida. Real-time monitoring and rapid verification of incidents was provided with closed circuit television (CCTV), and variable message signs (VMS) provide motorist information for this section of the freeway network.

Project Location: Dade County, Florida

Partner(s): Florida DOT

Start Date: July 1992

***End Date*:** December 1998

Estimated Total ITS Funds: $3,300,000

Estimated Total Project Cost: $4,125,000

***Contacts*:**

Maisar Khaled	FHWA Florida Division, HDA-FL	(850) 942-9596
Chung Tran	FHWA Florida Division, HDA-FL	(850) 942-9579

HOUSTON ITS PRIORITY CORRIDOR

Description:

The Houston partnership over a number of years worked cooperatively to develop transportation management and ITS initiatives in Houston. A fully developed, truly multimodal transportation management system serving needs such as provision of traveler information, public transportation and ridesharing, and commercial vehicle-oriented elements was envisioned. Early efforts focused on the on-going "Smart Commuter" project, and subsequent initiatives further enhanced effective utilization of Houston's extensive network of HOV lanes, park and ride lots, transit centers, and intermodal facilities. With I-45 / I-10 as key core elements, the Priority Corridor planning process covered all major transportation elements, with the goal of creating an ITS showcase within the northwest quadrant surrounding the US 290 freeway facility. A sample of the projects undertaken includes:

The Houston Priority Corridor identified the deployment of Incident Management and Traveler Information projects as their priorities. These ITS services served as the focus of deployment activities.

The "Smart Commuter" project was coordinated with other efforts in the Corridor. A number of additional projects were approved or submitted for approval as part of the Houston Priority Corridor Immediate Action Program during the FY 93-95 period.

EVALUATION OF ASTRODOME AREA CCTV LEASE - The objective of this initiative was to install closed circuit television on freeways and arterials that serve the Astrodome area to monitor traffic operations during special events as well as normal travel times. To accelerate the installation, the project leased the video system from a private vendor and used leased fiber optic cables to transmit the video. This was initiated in 1995.

DEVELOPMENT OF CORRIDOR PROGRAM PLAN - The Plan served as a living document which was annually reviewed and updated based upon both experience with deployed projects and evolving state-of-the-art ITS. Completed in July 1995.

AVI FOR TRAFFIC CONDITIONS AND INCIDENT DETECTION (PHASE 4) - This project expanded the installation of AVI to include High Occupancy Vehicle (HOV) lane access points from the Park and Ride and transit terminal facilities for shuttle bus operations and arterial streets that can serve as alternate routes to the freeway system. In addition, the freeway AVI system was augmented with sample stations to test the application of AVI as an incident detection system.

CHANGEABLE LANE ASSIGNMENT SYSTEM ON U.S. 290 FRONTAGE ROADS - This project designed, installed, and evaluated eleven dynamic lane assignment control systems that can alter the left turn lane assignments at intersections based on time-of-day traffic demands. Completed in February 1996.

PUBLIC INFORMATION AND PROGRAM ADMINISTRATION - The Program Administration office is responsible for the management, coordination, and technical administration of the Priority Corridor Program.

MONITOR/WARNING SYSTEMS FOR FREEWAY TO FREEWAY CONNECTIONS - The objective of this project was to implement a system which identifies unsafe speed conditions, which vary by vehicle size and weight, and initiates warning devices to prevent accidents by these vehicles.

REAL-TIME INFORMATION KIOSKS - This project deployed and tested the use of real-time kiosks at activity centers to enhance the travel decision-making process of commuters and travelers. The focus remains on providing improved information to transit and roadway system users to help them select the best travel mode, travel route, and time of travel.

RAILROAD GRADE CROSSING MONITORING SYSTEM - The objective of this project was to examine how information systems and traffic control systems can be used to monitor the movements of trains to adjust traffic patterns and advise emergency vehicles accordingly in the corridor to reduce delays at railroad grade crossings.

AVL FOR INCIDENT MANAGEMENT - The application of a fleet management system is essential for coordinated and effective operation of the Motorist Assistance Program (MAP). Quick response and effective dispatching of these units can reduce the time for emergency response and the time needed to restore normal traffic operations. The objective of this project was to increase the effectiveness of incident management by implementing an AVL system which identifies MAP vehicles and their locations on a real-time basis.

IN-VEHICLE NAVIGATION/INFORMATION APPLICATIONS - The objective of this project was to provide current information on travel conditions to travelers at all stages of their trip. Decision points for alternate routes exist at several points in the corridor - two of which are within the Houston Intercontinental Airport. The scope is limited at this time to simple map information, selection of the best route, and an update of travel conditions on selected freeways and at critical decision locations. - Discontinued

ENVIRONMENTAL CONDITIONS MONITORING SYSTEMS - The Houston area is subject to unpredictable and severe weather conditions that can result in extensive roadway flooding during periods of intensive rainfall. The objective of this project was to investigate the potential to integrate weather and roadway flooding information into the Advanced Traveler Information System (ATIS).

CHANGEABLE LANE ASSIGNMENT SYSTEM AT SELECTED INTERSECTIONS - This project expanded the deployment strategy to include traffic responsive operation between the traffic signal control system and the Changeable Lane Assignment System (CLAS) at two or three arterial street intersections in Harris County.

INTEGRATED CORRIDOR ATMS/ATIS - The concept and objective of the integrated corridor was to focus appropriate ITS technologies into coordinated management systems for future deployment as part of the Priority Corridor program. The core infrastructure developed in the Integrated Corridor provided the ability to monitor traffic conditions, operate traffic control systems, and communicate current operational conditions to travelers.

WASHBURN TUNNEL ATMS/ATIS - This project implemented automatic incident detection

and closure systems for the tunnel and developed traveler information services to advise travelers of conditions at the tunnel.

TRAFFIC MANAGEMENT AND TRAVELER INFORMATION FOR CRITICAL ROADWAY LINKS - This project focused ITS on critical roadway system links where incidents and construction can have a severe impact on the traveling public. Each targeted critical link serves as an evacuation route for hurricane evacuation. FY 1999 funding was added to this initiative which focused on the Fred Hartman Bridge Corridor (State Highway 46). FY 1999 funding was targeted for data integration of closed circuit TV, dynamic message signs, weather monitoring systems, wind velocity and advisory speed notification systems. Integration was achieved with TranStar (Houston's traffic and emergency management center). Four other corridors were identified for similar initiative subject to funding availability. System integration sought to support response procedures for roadway links targeted at routine traffic and environmental situations; reducing incidents; conditions resulting from extreme environmental conditions; natural/man made disasters.

ITS TECHNOLOGY FOR DATA COLLECTION AND TRANSPORTATION PLANNING - This project developed a system to facilitate use of the database at Houston TranStar for planning purposes. Vehicles may also be equipped with GPS, AVL, and AVI on-board technology to collect real-time traffic data for incorporation into a GPS.

INTEGRATING TRANSIT INFORMATION SYSTEM INTO TRANSTAR - This project integrated real-time transit information into TranStar, thus expanding TranStar into a Travel Management Center.

PROGRAM ADMINISTRATION - Provided support for years 3 - 5 of the Houston Priority Corridor program.

EN-ROUTE TRANSIT INFORMATION SYSTEM - This project provided an infrastructure capable of identifying a moving transit vehicle by a roadside transponder and using the vehicle's identity to trigger an appropriate bi-directional exchange of transit rider information and vehicle data with the roadside device.

ITS ENHANCED INCIDENT MANAGEMENT - This project includes Total Station Accident Investigation Surveying Devices, Development of Incident Management Command Vehicle, Laptop Computers with CAD software for officers, and Live Video Transmission to Dispatch Centers.

AUTOMATIC TRAFFIC MANAGEMENT IN FLOOD PRONE AREAS - Existing and new water level detectors have been integrated into TranStar.

DISSEMINATION OF INFORMATION - This initiative focused on the distribution of the following information in a variety of formats: Freeway Travel Speed Map, Travel Speed Map Text information, and Flood Control Map.

COORDINATED RAMP METERING AND INTERSECTION TRAFFIC SIGNAL CONTROL - This project deployed and evaluated concepts and strategies for inter-relating traffic signal

and ramp metering signal operations. Operational concepts included routine operating conditions and incident management conditions.

CONDITION RESPONSIVE UPTOWN TRAVELER INFORMATION SYSTEM - This joint public/private sector project developed improved way-finding systems to enhance the mobility and convenience of traveling for workers, shoppers, and visitors. Technologies included static signing, CCTV surveillance, variable message signing, kiosks, cellular phone hotline, HAR, and INTERNET information.

AUTOMATED INCIDENT MANAGEMENT STRATEGIES AND SUPPORT SYSTEMS - This project pre-planned "response scenarios" for freeway incidents which would take advantage of the integrated transportation management systems at TranStar.

INTEGRATION OF PRIORITY CORRIDOR PROJECTS INTO TRANSTAR - Houston's "Principal Integrator" was responsible for the overall development of TranStar computer systems and coordinated system integration and deployment to ensure that all systems functioned within the standards, guidelines, and established architecture.

Project Location: The Houston Metropolitan area in Harris County, Texas

Partner(s): The Texas DOT, Houston METRO, The City of Houston, and Harris County have formed a partnership, named TranStar, to guide transportation management and ITS activities.

Start Date: January 1993

***End Date*:** September 1997

Estimated Total ITS Funds: $20,084,939

Estimated Total Project Cost: $23,784,939

Contacts:

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Janie Light	Texas DOT TRF-TM	(512) 416-3258
David Fink	Houston TranStar	(713) 881-3064

HOUSTON SMART COMMUTER

Description: This field operational test was designed to evaluate the use of portable computing devices to provide travelers with real-time traffic conditions and transit options. A related objective was to assess instant rideshare-matching for employees in a non-downtown employment center. A final report was released in October 2002.

Project Location: Houston, Texas

Partner(s): Texas DOT, Houston Metro, TranStar, Texas Transportation Institute

Start Date: February 1993

***End Date*:** August 2002

Estimated Total ITS Funds: $2,500,000

Estimated Total Project Cost: $5,000,000

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678
Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Susan Beaty	Houston Metro	(713) 881-3029

HUMAN FACTORS COMPUTER - AIDED DESIGN TOOL FOR TRAFFIC MANAGEMENT CENTERS

Description: The primary product of this effort was the Ergo TMC, a web site that supports the incorporation of human-centered design principles in Transportation Management Center design. This web site (currently at http://ergotmc.gtri.gatech.edu/) consists of four modules and four utilities. The modules are the Design Guidelines, Design Assistant, Featured TMCs, and Report Templates. These four modules provide designers with ready access to a wide array of design guidelines that are applicable to design of TMC workrooms, workstations, software interfaces, and jobs. Examples of actual design implementations and the concept of operations that underlies those implementations are provided. Templates for specifying human-centered design in statements of work and other design requirements were also provided. Glossary, help, site map, intended to ensure that the appropriate human factors issues were considered at each stage of the TMC design process.

Project Location: Atlanta, Georgia

Contractor(s): Georgia Tech Research Corporation-Georgia Institute of Technology

Start Date: September 1996

***End Date*:** September 2000

Estimated Total ITS Funds: $1,745,000

Estimated Total Project Cost: $1,745,000

***Contacts*:**

Joe Moyer	FHWA - TFHRC, HRDS-07	(202) 493-3370

HUMAN FACTORS IN ADVANCED TRAFFIC MANAGEMENT SYSTEMS (ATMS) DESIGN EVOLUTION

Description:

The goal of this study was 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 include the development of a Human Factors Handbook for Traffic Management Center (TMC) Designers, a human-centered engineering analysis of an advanced traffic management center, a database of TMC human factors research and a stand-alone human factors research TMC simulator.

Products from the requirements analysis included second generation scenarios and systems objectives, definition of system functions, allocation of functions, operator performance requirements, task analysis and human factors design guidance. The Comparable Systems Analysis has been published by FHWA. The First Edition Human Factors Handbook of Traffic Management System Design has been published. The human factors studies in the experimental program have been completed.

Project Location: Atlanta, Georgia

Contractor(s): Georgia Tech Research Institute - Georgia Institute of Technology

Start Date: September 1992

***End Date*:** February 2000

Estimated Total ITS Funds: $5,416,297

Estimated Total Project Cost: $5,416,297

***Contacts*:**

Tom Granda	FHWA - TFHRC, HRDS-07	(202) 493-3365

HUMAN FACTORS PROGRAMS: ADMINISTRATIVE AND TECHNICAL SUPPORT

Description:

This effort focused on providing the necessary staffing and expertise required to assist the FHWA's Human Factors group in conducting and monitoring research efforts on various ITS subsystems. These studies included human factors investigations in Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), Automated Highway Systems (AHS), and Commercial Vehicle Operations (CVO). On-site staff research areas include In-Vehicle Signing (IVS) and In-Vehicle Safety Advisory Warning Systems (IVSAWS).

The major contractual efforts (involving ATMS, ATIS, and AHS) were being monitored in regard to critical analytical, empirical and integration human factors issues that will result in design guidelines addressing the specific and integrated ITS areas. The empirical aspect was of pivotal importance in that numerous simulation and field research studies will be conducted and analyzed to provide specific human factors research results that will be transformed into design guidelines and computer-aided design packages. In-house ITS research staff projects are also developed, managed, and monitored as part of the Human Factors Research Program. Significant human factors ITS knowledge gaps that are identified will be addressed through contract or staff research.

Project Location: McLean, Virginia

Contractor(s): Science Applications International Corporation (SAIC)

Start Date: April 1994

***End Date*:** October 1998

Estimated Total ITS Funds: $4,530,000

Estimated Total Project Cost: $7,900,000

***Contacts*:**

Dr. Sam Tignor	FHWA - TFHRC, HRDS-03	(202) 493-3363

I-275, ST. PETERSBURG, FLORIDA

Description: This project provided a variable message sign system on I-275. It included two variable message signs and the central control system.

Project Location: St. Petersburg, Florida

Partner(s): Florida DOT

Start Date: October 1998

***End Date*:** December 2001

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,000,000

***Contacts*:**

Chung Tran	FHWA Florida Division, HDA-FL	(850) 942-9650	Ext. 3041
Bijan Behzadi	Florida DOT	(813) 975-6733	

I-287 SURVEILLANCE SYSTEM

Description: This project deployed closed circuit TV cameras, as well as the necessary hardware, software, and communication systems, on I-287 in New York State.

Project Location: New York

Partner(s): New York State Thruway Authority (NYSTA)

Start Date: February 1993

***End Date*:** May 2000

Estimated Total ITS Funds: $400,000

Estimated Total Project Cost: $1,500,000

***Contacts*:**

Mike Schauer	FHWA New York Division, HTD-NY	(518) 431-4125
Chris Jones	NYSTA	(518) 471-5002

I-95 NORTHEAST ITS PRIORITY CORRIDOR

Description:

The purpose of the I-95 Northeast Corridor was to test, showcase and deploy a variety of ITS services in the Corridor. The I-95 Corridor Coalition completed development of an initial "Business Plan" in May 1993. Updated in mid-1995, mid-1996, and again in early 1998, this plan, which is complemented by a Strategic Plan, is the cornerstone of the I-95 Corridor Coalition's program management. A number of feasibility, operational testing, and deployment activities were accomplished as listed below (project completion dates in parentheses).

Information Exchange Network - This project interconnected the corridor agencies into single, dedicated information exchange network for improved communication (December 1996). Ongoing under TEA-21.

Incident Management - This project developed uniform incident management techniques throughout the Corridor, including coordinated multi-agency response (December 1996). Ongoing under TEA-21.

Surveillance Requirements/Technology - This project developed a plan for implementation of a cost-effective, seamless, Corridor-wide surveillance system with state-of-the-art technologies. This system will serve as a platform for development, testing, and deployment of advanced technologies, and for integrating private sector initiatives with government operated systems (August 1995).

Commercial Vehicle Operations - This project developed a Corridor CVO program that coordinates on-going agency, State, Federal, Motor Carrier, and private sector CVO initiatives. An operational test of an automated traveler information system for commercial vehicles was conducted under TEA-21.

Public/Private Sector Outreach - This Project determined the barriers and opportunities for private sector participation in Coalition activities and develop uniform policies and procedures as necessary to promote public/private partnering (on-going).

User Needs and Marketability - This project surveyed the needs of Corridor travelers and determining whether or not a commercial market exists for ATIS services in the Corridor (July 1996).

Traveler Information Services - This project established the foundations for improved traveler information services in the Corridor through a variety of dissemination methods. A feasibility study was completed in December 1995. An operational test in this area got underway in 1997 (December 2000).

Coordinated VMS/HAR Strategies - The ultimate goal of this project was to provide real-time and consistent traveler information throughout the Corridor using dynamic message signs (DMS) and highway advisory radio (HAR) as dissemination media. A needs definition and feasibility study was completed in July 1995, and an operational test to evaluate the technical and cost effectiveness of operating HAR stations in a coordinate fashion was conducted (March 2000).

Technology Exchange and Training - The objectives of this project were to upgrade overall skill levels of agency staff; use staff skills and knowledge to train others; disseminate up-to-date technical information; and act as a showcase for software, hardware, and program elements. Ongoing under TEA-21.

Intermodal Outreach and Information Exchange - This project expanded Coalition membership to attract additional intermodal members and improve technical and institutional coordination between members representing the various modes (June 1996).

Corridor-Wide AVI/ETTM Strategy - This project developed a long term strategy for achieving ETTM compatibility in the Corridor (February 1997).

Regional Information and Coordination Centers - This project studied the feasibility and developed recommendations regarding regional coordination of Coalition activities (April 1997).

Long Range Strategic Plan - This project developed the Coalition's first Strategic Plan (June 1995).

Rural Mayday/800 Call-In System - This project tested the feasibility of using cellular phones or in-vehicle devices to expedite reporting of incidents and emergencies in rural areas (April 1997).

Long Term Financing - This project identified a stable and predictable source of funding to support Coalition activities that is capable of addressing Federal and Coalition member requirements, while allowing flexibility to address changing Coalition needs (February 1997).

NTCIP for VMS - This operational test evaluated the National Transportation Communications for ITS Protocol (NTCIP) for use with VMS. Expanded ITS Standards testing is ongoing under TEA-21.

Training - The objective of this project is to create an integrated ITS Education and Training Program. A consortium of Universities located within the Coalition states was established that may provide graduate and undergraduate level courses, as well as skill-based training and technology transfer (March 2000).

CVO ATIS (Fleet Forward) - This project tested the feasibility of enhancing motor carrier safety and operational efficiency by providing information to improve carrier routing and dispatching. (December 1998).

CVO Roadside Safety - This project tested an information exchange system designed to help motor carrier enforcement officials focus roadside inspections and enforcement on high-risk motor carriers (December 1999).

CVO Electronic Registration - This project tested an information system designed to help State agencies streamline credentials administration (December 1999).

CVO Electronic Clearance - This project tested mainline electronic screening and clearance of commercial vehicles by mobile enforcement units (December 1999).

CVO Safety Management - This project developed a prototype of a comprehensive, performance-based motor carrier safety management program to reduce highway accidents and incidents in the I-95 Corridor (December 1999).

Corridor coalition activities also involve consultant support services, use of volunteer support staff from member agencies, and a number of immediate deployment action projects.

Project Location:

Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and Virginia

Partner(s):

Coalition Members: The Departments of Transportation in Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, New York City, Pennsylvania, Rhode Island, Vermont, and Virginia. Also members are the Delaware River & Bay Authority, Delaware River Port Authority, Delaware Turnpike Administration, Maine Turnpike Authority, Maryland Transportation Authority, Massachusetts Turnpike Authority, New York State Thruway, New York Metropolitan Transportation Authority, New Jersey Highway Authority, New Jersey Turnpike Authority, Pennsylvania Turnpike Commission, Port Authority of New York & New Jersey, South Jersey Transportation Authority, and Triborough Bridge & Tunnel Authority. In addition, other agencies in the transportation community in the Northeast participate as affiliate members.

Start Date: May 1993

***End Date*:** September 1997

Estimated Total ITS Funds: $44,746,666

Estimated Total Project Cost: $58,751,315

Contacts:

Steve Clinger	FHWA Eastern Resource Center, ERC-MD	(410) 962-0095	Ext. 3055
John Baniak	I-95 Corridor Coalition Executive Director	(518)584-4826	
Michael Eadicicco	I-95 Corridor Coalition Operations Coordinator	(201)798-3356	
Albert Karoly	I-95 Corridor Coalition Operations Coordinator	(518)457-7438	

INCIDENT DETECTION ISSUES - PART I : FREEWAYS

Description: The "Incident Detection Issues - Part I (Freeways)" project developed a support system in three modular parts. The first part developed malfunction management techniques to help provide useful data under conditions of detector component failure. The second part developed algorithms to take the information and develop a "current status" of the network. The third part developed algorithms that will detect an incident when there are significant discrepancies in the predicted/expected overall network operating status.

Project Location: San Luis Obispo, California

Contractor(s): VERAC; BALL Systems

Start Date: April 1993

***End Date*:** September 1997

Estimated Total ITS Funds: $1,923,000

Estimated Total Project Cost: $1,923,000

***Contacts*:**

Aladdin Barkawi	FHWA - TFHRC, HRDO-03	(202) 493-3270

INTEGRATED CORRIDOR MANAGEMENT

Description: This project was conducted by the New Jersey DOT in cooperation with the Pennsylvania DOT and the Delaware Valley Regional Planning Commission. Project components included 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.

Project Location: Southern New Jersey and Philadelphia Metropolitan Area

Partner(s): New Jersey DOT

Start Date: August 1992

***End Date*:** June 2001

Estimated Total ITS Funds: $6,000,000

Estimated Total Project Cost: $7,500,000

***Contacts*:**

Keith Sinclair	FHWA New Jersey Division, HTC-NJ	(609) 637-4204
Kurt Aufschneider	New Jersey DOT	(609) 866-4980

INTEGRATION OF TRAFFIC OPERATIONS AND TRAFFIC DATA COLLECTIONS

Description: This research established a process and methodology for the integrated collection of traffic data. This research resulted 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 conducted this study.

Project Location: Atlanta, Georgia

Contractor(s): Georgia DOT and Washington State DOT

Start Date: July 1993

***End Date*:** December 2000

Estimated Total ITS Funds: $495,000

Estimated Total Project Cost: $495,000

***Contacts*:**

Ralph Gillmann	FHWA Headquarters, HPPI	(202) 366-5042

INTELLIGENT CORRIDOR SYSTEM

Description: The Southeast Florida Intelligent Corridor System (ICS) integrates the 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 and Safety Systems (AVCSS). The extensive intermodal aspects of the I-95 corridor within Palm Beach, Broward, and Dade Counties are a priority in the development of the ICS. Initial early implementation activities centered around the ATMS function. Park-and-Ride lots, High Occupancy Vehicle (HOV) lanes, commuter rail, heavy rail, bus, and connections to airport cruise port, and seaport facilities are all present in the corridor. The overall goal of the project was to provide real-time information to assist I-95 corridor travelers with guidance and mode decisions prior to and during a trip. Phase I of the project (completed in December 1994) provided a design report and a preliminary engineering and operational analysis. Phase II has performed the final design to deploy ITS technologies to provide real-time intermodal information on the I-95 corridor.

Project Location: Miami - Ft. Lauderdale, Florida

Partner(s): FHWA, Florida DOT

Start Date: July 1992

***End Date*:** May 1998

Estimated Total ITS Funds: $6,180,000

Estimated Total Project Cost: $7,725,000

***Contacts*:**

Chung Tran	FHWA Florida Division, HDA-FL	(850) 942-9579
Maisar Khaled	FHWA Florida Division, HDA-FL	(850) 942-9596
Rory Santana	Florida DOT	(305) 470-5335

INTELLIGENT TRANSPORTATION SYSTEMS - POLICY, OPERATIONS AND SYSTEMS RESEARCH CENTER

Description: This project provided an evaluation of the SmarTraveler Project and its impact on the Washington Metropolitan area. The project developed a coordinated plan for multi-year research to be conducted by the Urban Transportation Consortium comprised of George Mason University, the University of Virginia and Virginia Polytechnic Institute. This activity established the foundation for a six-year, $2 million per year Urban Transportation Consortium project funded by U. S. DOT's Research and Special Programs Administration. George Mason University developed corridor-specific planning models for the I-66 and I-81 corridors for the Fairfax Planning Commission and will focus on ITS institutional policy issues. The University of Virginia concentrated on ITS Systems Engineering issues, while Virginia Polytechnic Institute focused on research relating to ITS operations and intelligent infrastructure.

Project Location: Fairfax County, Virginia

Contractor(s): George Mason University, University of Virginia & Virginia Polytechnic Institute

Start Date: September 1998

***End Date*:** October 1999

Estimated Total ITS Funds: $750,000

Estimated Total Project Cost: $939,000

***Contacts*:**

David Gibson	FHWA - TFHRC, HRDO-04	(202) 493-3271
Roger Stough	George Mason University	(703) 993-2281

ITS FOR VOLUNTARY EMISSIONS REDUCTION

Description: An active infrared roadside emissions sensor and a variable message sign at a freeway exit ramp provided real-time vehicle emissions readings to passing motorists. A telephone information hotline, and brochures were made available at area service stations provided motorists additional information on the benefits of keeping their vehicle tuned. The focus of this project was to prompt people to tune their vehicles to reduce emissions. The effectiveness of the test was evaluated through surveys and by measurement of identified high emitters at the site over time. The primary objective of this test was to evaluate the usefulness and public acceptance of providing real-time emissions information to drivers and education material about the fuel savings and air quality benefits of well tuned vehicles.

Project Location: Denver, Colorado

Partner(s): Colorado DOT, University of Denver, Remote Sensing Technologies Inc., Conoco Inc., Skyline Products Inc.

Start Date: September 1994

***End Date*:** August 1997

Estimated Total ITS Funds: $304,663

Estimated Total Project Cost: $498,358

***Contacts*:**

Scott Sands	FHWA Colorado Division, HFO-CO	(303) 969-6730	Ext. 362
John Kiljan	Colorado DOT	(303) 512-5858	

ITS MODELS AND SIMULATION SYSTEMS PROGRAM

Description: This activity modified existing traffic models to simulate ITS 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 also examined 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.

Project Location: Colorado Springs, Colorado

Contractor(s): ITT Systems and Sciences

Start Date: September 1995

***End Date*:** April 1998

Estimated Total ITS Funds: $2,969,872

Estimated Total Project Cost: $3,169,796

***Contacts*:**

Raj Ghaman	FHWA - TFHRC, HRDO-03	(202) 493-3270

JOHNSON CITY, TN

Description: Phase I of the Johnson City Med/Tech Corridor ITS Project used advanced computer and communications technology to more effectively manage parking and travel within a city dominated by an institutional corridor. Phase II of the Johnson City ITS Project expanded upon the parking management technologies tested in Phase I to develop a broadly-deployed ITS system incorporating automated traffic signal control technologies, Advanced Transit Management Systems, and dissemination of transportation information via the Internet. The technologies used for travel management are designed to conform to the national ITS architecture for modular addition of ITS services. Specific objectives achieved in Phase II included: use of GIS to support interactive control of Johnson City MONARC traffic signal control system and to optimize traffic signal timing for real-time response to traffic loads; specify, design, and install Automatic Vehicle Location System, computer-aided dispatch, and automated paratransit scheduling to optimize transit and paratransit operations; develop an Internet site for public access for ATIS and for public participation in the transportation planning process; and promote public awareness and use of ITS products.

Project Location: Johnson City, Tennessee

Partner(s): Tennessee DOT, City of Johnson City, and Raytheon (Phase I)

Start Date: July 1994

***End Date*:** January 1998

Estimated Total ITS Funds: $3,730,000

Estimated Total Project Cost: $4,662,500

***Contacts*:**

Michael Smart	FHWA Tennessee Division, HPR-TN	(615) 781-5775
Alan Briowell	City of Johnson City	(423) 434-6272

KANSAS CITY - INTELLIGENT TRANSPORTATION SYSTEM DEPLOYMENT

Description: This project implemented Phase I of the Kansas City ITS Strategic Deployment Plan which includes a freeway incident management system along 77 kilometers of Interstate highways in both Missouri and Kansas.

Project Location: Kansas City Metropolitan Area

Partner(s): Kansas DOT, Missouri DOT

Start Date: July 1998

***End Date*:** September 1998

Estimated Total ITS Funds: $2,500,000

Estimated Total Project Cost: $3,125,000

***Contacts*:**

Bob Thomas	FHWA Missouri Division, HDA-MO	(573) 636-7104
Sabin Yanez	Missouri DOT	(816) 889-6450
Matt Volz	Kansas DOT	(413) 296-6356

LYNX PASSENGER TRAVEL PLANNING SYSTEM

Description: This cooperative agreement supported the efforts of the Central Florida Regional Transportation Authority (LYNX) to develop a transit component for their Passenger Travel Planning System. The project developed a traveler planning center and installed electronic bus stop displays and a vehicle location system, integrated with an existing signal pre-emption system. Electronic emitters were installed in transit buses and are being read by existing electronic detectors at signalized intersections. The vehicle data are being relayed from the intersection to the Transportation Management Center, and to the transit operator, who provides next-bus information to customers through bus stop displays. Vehicle data are also being used to monitor transit fleet performance and improve service.

Project Location: Central Florida

Partner(s): Central Florida Regional Transportation Authority

Start Date: January 1996

***End Date*:** February 2001

Estimated Total ITS Funds: $240,000

Estimated Total Project Cost: $300,000

***Contacts*:**

Ron Boenau	FTA Headquarters, TRI-11	(202) 366-0195	
Ann Joslin	Lynx	(407) 841-2279	Ext. 3204

MAGIC (METROPOLITAN AREA GUIDANCE INFORMATION & CONTROL)

Description: Deployment of MAGIC (Metropolitan Area Guidance Information & Control) system diverted motorists from congested or emergency/incident locations to alternative routes. The system was implemented in three construction phases.

Project Location: Northern New Jersey

Partner(s): New Jersey DOT

Start Date: January 1992

***End Date*:** March 2001

Estimated Total ITS Funds: $10,280,000

Estimated Total Project Cost: $106,280,000

***Contacts*:**

Keith Sinclair	FHWA New Jersey Division, HTC-NJ	(609) 637-4204
Bob Dibartolo	New Jersey DOT	(609) 530-2551

MIDWEST (GARY-CHICAGO-MILWAUKEE) ITS PRIORITY CORRIDOR

Description:

The States of Indiana, Illinois, and Wisconsin formed a coalition to apply ITS in the Priority Corridor connecting Gary, Chicago, and Milwaukee (i.e. the "GCM Corridor"). Multi-state agreements were signed and the coalition worked closely with the US DOT and local, multi-modal organizations to operate transportation systems in the corridor. An Executive and Technical Committee structure was established to involve appropriate management and technical level representatives.

Using I-80, I-90, and I-94 as a backbone, the corridor was broadly defined to encompass the 16 contiguous urbanized counties in the three States. The corridor extends over some 130 miles and covers more than 2,500 square miles. All major freeways, tollways, arterials, transit systems, airports, ports and intermodal facilities were identified as part of the corridor planning process.

The coalition's consultant team developed a Corridor Program Plan (CPP), used focus groups, surveys, interviews, and worked closely with the Technical Committee to identify the transportation problems or "user needs" in the corridor, along with potential ITS remedies through a variety of multi-modal ITS "User Services". The initial CPP was approved by the Executive Committee in June, 1995, and was updated in July, 1997. It presented near-term (1-2 year) and longer-term (3-20 year) projects for the implementation, management and evaluation of a multi-state, multi-modal ITS corridor program. The CPP identified 10 program areas:

- Multi-Modal Traveler Information System
- Integrated Transit System
- Incident Management Programs
- GCM Technical and Planning Support
- Traffic Management Systems
- Commercial Vehicle Operations
- Traffic Signal Integration
- Vehicle Transponder Systems
- Advanced Incident Reporting and Mayday Security
- Private/Public Partnerships.

In accordance with the CPP, the GCM Priority Corridor implemented a four-year program of projects. Examples of projects initiated by the Corridor include:

- Development of Regional Strategic Plans, Corridor Strategic Plan and Corridor Architecture
- On-Board Vehicle Warning System for Railroad Grade Crossings pilot test

Expansion and Enhancements of the Indiana Hoosier Helpers Program - this effort included the hiring and training of new staff members, expansion of coverage to 24 hours/day, and purchasing of additional patrol vehicles. An expert system was developed to extend the wireless communication system installed under the Borman Expressway project to support the transmission of closed-circuit video, data, and location information directly from incident scenes. This expert system is capable of identification and notification of the proper emergency response agencies.

Equipment Upgrade of the Illinois Emergency Traffic Patrol - the emergency traffic patrol fleet was equipped with quick-tow devices which enable operators to safely and expeditiously relocate disabled vehicles to a safe location off of the highway system without having to exit the patrol vehicle. This significantly decreased both the exposure of the operator to dangerous roadway conditions and the time required to clear minor accidents.

Wisconsin Integrated Corridor Operations Study and Operational Test

The GCM Priority Corridor developed a Public Information Center. This center serves as a centralized source of information for all GCM Corridor initiatives. The center includes an 800-telephone voice mail information line to serve public inquiries.

Continued Federally-funded activity in the region encompassed by the GCM ITS Priority Corridor under TEA-21 is delivered through the TEA-21 Congressionally-directed appropriation called Great Lakes ITS Corridor.

Project Location: Lake, Porter, and Laporte counties in Indiana; McHenry, Lake, Kane, Cook, Dupage, and Will counties in Illinois; and Washington, Ozaukee, Waukesha, Milwaukee, Walworth, Racine, and Kenosha in Wisconsin.

Partner(s): Chicago Area Transportation Study, Illinois DOT, Indiana DOT, Illinois State Toll Highway Authority, Milwaukee County Public Works, Northern Indiana Commuter Transportation District, Northwest Indiana Regional Planning Committee, Regional Transportation Authority, Southeast Wisconsin Regional Planning Committee, Wisconsin DOT, Argonne National Laboratory, Chicago Transit Authority, City of Chicago DOT, City of Milwaukee, Marquette University, Metra, and Milwaukee County Transit and Pace

Start Date: January 1993

***End Date*:** September 1997

Estimated Total ITS Funds: $18,690,000

Estimated Total Project Cost: $23,362,499

Contacts:

John Berg	FHWA Wisconsin Division, HDA-WI	(608) 829-7503
Wendall Meyer	FHWA Illinois Division, HDA-IL	(217) 492-4634
Dennis Lee	FHWA Indiana Division, HDA-IN	(317) 226-5234
Jeff Hochmuth	Illinois DOT	(847) 705-4800
Dan Shamo	Indiana DOT	(317) 232-5523
Phil DeCabooter	Wisconsin DOT	(608) 267-0452

MOBILE COMMUNICATIONS SYSTEM

Description: This project tested and evaluated the use of a portable detection and surveillance system for highway construction, special events, and incident locations. Specially-equipped trailers were placed at temporary traffic congestion locations throughout Orange County. Trailer-mounted video image detectors used spread spectrum radio for transmission of real-time information to a CalTrans control center.

Project Location: Orange County, California

Partner(s): California DOT (CalTrans), City of Anaheim, City of Irvine, Hughes Aircraft, CalPoly University, PATH, California Highway Patrol, Orange County Transportation Authority, and the University of California - Irvine's Institute of Transportation Studies

Start Date: May 1994

***End Date*:** July 1999

Estimated Total ITS Funds: $2,459,432

Estimated Total Project Cost: $3,679,690

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(916) 498-5005
John Thai	City of Anaheim	(714) 765-5183

MOBILE, ALABAMA FOG DETECTION SYSTEM

Description: This project expanded a fog detection and tunnel management system into a full incident management system on the seven-mile Bay Bridge and other segments of I-10 through Mobile, Alabama. This system includes fog detection sensors, variable speed limit signs, lane control systems and Traffic Control Center renovations.

Project Location: Mobile, Alabama

Partner(s): Alabama DOT

Start Date: September 1996

***End Date*:** September 2000

Estimated Total ITS Funds: $5,000,000

Estimated Total Project Cost: $6,500,000

***Contacts*:**

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377

MONTGOMERY ADVANCED TRAFFIC MANAGEMENT SYSTEM

Description: This project resulted in the development of an Advanced Traffic Management System for the City of Montgomery. It included the installation of 12 miles of fiber optic cable along the southern and eastern by-passes that inter-connected all traffic signals along that corridor. It also installed cameras at major intersections.

Project Location: Montgomery, Alabama

Partner(s): FHWA, Alabama DOT, City of Montgomery

Start Date: August 1997

***End Date*:** December 1998

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,000,000

***Contacts*:**

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377

MULTI-JURISDICTIONAL LIVE AERIAL VIDEO SURVEILLANCE SYSTEM, I

Description: This ITS operational test project provided for the procurement, installation, and evaluation of 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 was transmitted to police and state highway traffic management centers, and to mobile command centers at incident sites. Communications technologies included microwave, Community Access TV (CATV), and state-owned coaxial cable. It was found that the use of real-time airborne video serves as a valuable component of an Advanced Traffic Management System (ATMS), particularly in major incident management.

Project Location: Fairfax County, Virginia

Partner(s): Fairfax County Police, Virginia State Police, and Virginia DOT

Start Date: September 1991

***End Date*:** July 1995

Estimated Total ITS Funds: $355,000

Estimated Total Project Cost: $355,000

***Contacts*:**

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
Jim Chu	Virginia DOT	(703) 383-2600
CPT. Bob Fitzpatrick	Fairfax County Police	(703) 556-7750

MULTI-JURISDICTIONAL LIVE AERIAL VIDEO SURVEILLANCE SYSTEM, II

Description: Similar in concept to the completed project in Fairfax County, Virginia, this operational test project evaluated live video transmission from fixed-wing aircraft to county and state traffic management centers. Maryland and Virginia cooperated in this effort and transmitted video to traffic management centers in both states. Maryland, like Virginia, also tested the feasibility of transmitting live video to mobile command centers. The project was recently amended to include establishment of a data and video link between the Montgomery County ATMS and the ITS Room located at US DOT Headquarters in Washington, DC.

Project Location: Montgomery Country, Maryland

Partner(s): Montgomery County Office of Traffic and Maryland State Highway Administration

Start Date: September 1991

***End Date*:** June 1997

Estimated Total ITS Funds: $645,000

Estimated Total Project Cost: $645,000

***Contacts*:**

Breck Jeffers	FHWA Maryland Division, HB-MD	(410) 962-4342	Ext. 129
Mike Zezeski	Maryland State Highway Administration	(410) 787-5859	
Emil Wolanin	Montgomery County	(301) 217-2208	

MULTI-USE SMART CARD SPECIFICATIONS AND GUIDELINES DEVELOPMENT

Description: Five guidelines documents were developed in this project examining potential transit payment system partnerships: transit-transit; transit-university; transit-financial institution; transit-toll collection and transit-employer. In addition to these products this effort included a significant outreach component to transit operators that included support for numerous local workshops around the country. The products and expertise developed in this project form some of the basis for the APTA Universal Transit Farecard Standards Program begun in 2001.

Project Location: Cambridge, Massachusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: May 1998

***End Date*:** July 2001

Estimated Total ITS Funds: $600,000

Estimated Total Project Cost: $600,000

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678
Mike Dinning	Volpe National Transportation Systems Center	(617) 494-3793
Leisa Moniz	Volpe National Transportation Systems Center	(617) 494-3793

NETWORK-WIDE OPTIMIZATION OF MODELS

Description: The objective of this contract was 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, and (3) optimize signal timing at isolated intersections, on arterials, and in closed networks. In addition, a Windows-based user interface based on a graphical user interface utilizing point-and-click technology was developed for this package.

Project Location: Rockville, Maryland

Contractor(s): PB Farradyne, Inc.

Start Date: November 1992

***End Date*:** May 1998

Estimated Total ITS Funds: $1,655,000

Estimated Total Project Cost: $1,655,000

***Contacts*:**

Deborah Curtis	FHWA - TFHRC, HRDO-03	(202) 493-3267

NEVADA ARCHIVED DATA SUBSYSTEM COMPONENT OF LAS VEGAS AREA FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Description: This project conducted a detailed design of an archived data subsystem to be integrated with the Las Vegas Area Freeway and Arterial System of Transportation (FAST). The archived data design provided the capability to receive, collect, retain and distribute data generated by ITS for use in other transportation activities by all stakeholders in the region. FAST is a multimodal, multi-jurisdictional integrated traffic management and traveler information system. Initially, the FAST system will include the following user services: Traffic Control; Incident Management; En-route Driver Information; Pre-trip Traveler Information and the Archived Data User Service (ADUS) to be implemented in this project. Major components of the ADUS include: data processing; data storage; data retrieval; and implementation of privacy procedures.

Project Location: Las Vegas Area

Partner(s): Nevada DOT; Regional Transportation Commission; Clark County; Cities of North Las Vegas, Las Vegas, and Henderson

Start Date: September 1999

***End Date*:** October 2000

Estimated Total ITS Funds: $105,095

Estimated Total Project Cost: $225,000

***Contacts*:**

Jim Allen	FHWA Nevada Division, HDA-NV	(775) 687-1231
D. Keith Maki	Nevada DOT	(775) 888-7446

NEW JERSEY ELECTRONIC TOLL AND TRAFFIC MANAGEMENT

Description: A single Electronic Toll and Traffic Management (ETTM) system was deployed region-wide permitting use of a single "electronic tag" on vehicles on any toll facility throughout the region.

Project Location: Major New Jersey toll roads

Partner(s): New Jersey DOT, South Jersey Transportation Authority, New Jersey Highway Authority, and New Jersey Turnpike Authority

Start Date: January 1992

***End Date*:** March 2000

Estimated Total ITS Funds: $35,000,000

Estimated Total Project Cost: $43,000,000

***Contacts*:**

Keith Sinclair	FHWA New Jersey Division, HTC-NJ	(609) 637-4204
Dominick Critelli	New Jersey DOT	(609) 530-2462

NEW JERSEY POLICE COMMUNICATION CENTER

Description: The purpose of this project was to establish a prototype law enforcement communications/patrol center on a site adjacent to the New Jersey Turnpike. The center has the capability to receive traffic information and real-time VMS displays from the Turnpike's existing Automated Traffic Surveillance and Control System. The center also is capable of disseminating this information to patrol vehicles via mobile data terminals (MDTs). The goals and objectives of this project included enhanced traffic management capability, improved response to incidents, improved efficiency of enforcement functions and improvement of the institutional relationship between State Police and traffic operations personnel.

Project Location: New Jersey

Partner(s): New Jersey Turnpike Authority and New Jersey DOT

Start Date: September 1993

***End Date*:** June 2001

Estimated Total ITS Funds: $3,500,000

Estimated Total Project Cost: $5,053,238

***Contacts*:**

Keith Sinclair	FHWA New Jersey Division, HTC-NJ	(609) 637-4204
Dom Critelli	NJ DOT	(609) 530-2462

NEW JERSEY SIGNAL COMPUTERIZATION

Description: A coordinated computerized signal system on Route 18, Route 73, and Route 1, was deployed utilizing advanced traffic control software and video surveillance.

Project Location: New Jersey

Partner(s): New Jersey DOT

Start Date: January 1992

***End Date*:** December 1998

Estimated Total ITS Funds: $13,000,000

Estimated Total Project Cost: $39,000,000

***Contacts*:**

Keith Sinclair	FHWA New Jersey Division, HTC-NJ	(609) 637-4204
Roy Gustavason	New Jersey DOT	(609) 530-2604

NEW JERSEY TURNPIKE PROJECT

Description: This project supports the expansion of the New Jersey Turnpike Automatic Traffic Surveillance and Control System. The project installed and evaluated additional closed circuit television locations, variable message signs and a weather surveillance subsystem.

Project Location: New Jersey

Partner(s): New Jersey DOT and New Jersey Turnpike Authority

Start Date: July 1995

***End Date*:** July 2001

Estimated Total ITS Funds: $2,625,000

Estimated Total Project Cost: $11,200,000

***Contacts*:**

Keith Sinclair	FHWA New Jersey Division, HTC-NJ	(609) 637-4204
Dom Critelli	NJ DOT	(609) 530-2462

NEW YORK-NEW JERSEY-CONNECTICUT (TRANSCOM) ITS INFRASTRUCTURE MODEL DEPLOYMENT

Description: The New York City metropolitan area Model Deployment showcased ITS infrastructure to millions of local commuters, commercial vehicle operators, and other travelers. TRANSCOM, the lead organization, is a consortium of fifteen transportation and public safety agencies from throughout the region. The widely dispersed public agencies implemented a Regional Transportation Management System connecting member agencies through a "virtual" Transportation Management Center. A contractor operates a Multimodal Traveler Information System that includes personalized information to the public for a fee, eventually becoming self-supporting.

Project Location: New York City metropolitan area, NY/NJ/CT

Partner(s): TRANSCOM, New York State DOT, and the Northeast Consultants

Start Date: October 1996

***End Date*:** June 1999

Estimated Total ITS Funds: $10,610,000

Estimated Total Project Cost: $15,067,648

***Contacts*:**

Michael Schauer	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 236
Ed Roberts	New York State DOT	(518) 457-1232	
Rob Bamford	TRANSCOM	(201) 963-4033	

NEW YORK THRUWAY AUTHORITY ALBANY TRAFFIC OPERATIONS CENTER

Description: The New York State Thruway developed and implemented integrated transportation workstations. Initial installations are at Thruway headquarters in Albany. These workstations tie together highway advisory radio, variable message signs, closed circuit television, and computer-aided dispatching technologies throughout New York State.

Project Location: Albany, New York

Partner(s): New York State Thruway Authority (NYSTA)

Start Date: March 1996

***End Date*:** December 1999

Estimated Total ITS Funds: $1,500,000

Estimated Total Project Cost: $1,875,000

***Contacts*:**

Michael Schauer	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 236
Barry Solomon	New York State Thruway Authority	(518) 436-4352	

NEW YORK THRUWAY ELECTRONIC TOLL COLLECTION AND TRAFFIC MANAGEMENT

Description: As part of the E-Z-PASS Interagency Group (a coalition of seven toll authorities in New York, New Jersey, Delaware, and Pennsylvania), the New York State Thruway Authority (NYSTA) is deploying Electronic Toll Collection and Traffic Management (ETTM) on its facilities. NYSTA's aggressive ETTM program resulted in applying the Automatic Vehicle Identification (AVI) technology to the 63 toll plazas of the Thruway's 641-mile system by the end of 1996. The proposed distributed system accommodates both commercial vehicles and commuter traffic with read-write technology. The NYSTA is also creating a multi-agency automated billing system for seamless customer service on other E-Z PASS systems.

Project Location: New York Thruway

Partner(s): New York State Thruway Authority

Start Date: April 1994

***End Date*:** November 1998

Estimated Total ITS Funds: $14,650,000

Estimated Total Project Cost: $35,850,000

***Contacts*:**

Mike Schauer	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 236
Barry Solomon	New York State Thruway Authority	(518) 471-4352	

NORFOLK MOBILITY MANAGER

Description: This project operationally tested and evaluated how transit and paratransit user subsidies can improved transportation services available to low-income transit riders. Subsidies provided directly to low-income people encouraged private operators to provide better transportation services. Part of the project allowed 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, gave them to qualified employees as a benefit. Employees used the vouchers to pay for the transit service of their choice. In addition to working through employers, the project included an effort to work with social service agencies, especially in the medical area.

Project Location: Norfolk, Virginia

Partner(s): Tidewater Transportation District Commission

Start Date: April 1989

***End Date*:** December 1993

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $600,000

***Contacts*:**

Ron Boenau	FTA Headquarters, TRI-11	(202) 366-0195

NORTH DAKOTA STATE UNIVERSITY ADVANCED TRAFFIC ANALYSIS CENTER

Description: The purpose of this project was to establish a center to provide a facility at which traffic analysis can be performed for second-tier cities (approximately 50,000-400,000 population). The center also serves as a testbed at which system designs developed at the center can be tested and demonstrated. These demonstrations can be used in conjunction with the simulation environment to offer effective training and hands-on experience for transportation professionals and elected officials. After four years from inception, the center is intended to achieve financial independence by conducting research and service for second-tier cities. The center will create a simulated environment that will allow effective evaluation of existing and proposed traffic control plans using available software and hardware. Funding depicted includes FY 1999 Earmarked appropriations obligated in FY 2000.

Project Location: Fargo, North Dakota

Contractor(s): North Dakota State University

Start Date: October 1998

***End Date*:** September 2000

Estimated Total ITS Funds: $1,149,000

Estimated Total Project Cost: $1,149,000

***Contacts*:**

Raj Ghaman	FHWA - TFHRC, HRDO-03	(202) 493-3270

NORTHERN VIRGINIA TRAFFIC SIGNAL MANAGEMENT SYSTEM

Description: This project implemented a computerized traffic signal system in the Virginia DOT Northern Virginia District and initially includes about 800 signals in Fairfax, Prince William, and Loudoun Counties. The system is a computer-based, networked, central system operating on a multi-tasking environment. Communication to the signals is by leased digital telephone lines. The system provides information management, reporting and analysis of data, inventory control, maintenance logging, real-time graphics display, location designs, and cabinet wiring diagrams. The system has the ability to upload and download all timing settings, operations parameters, and status information from the central control room or remote access locations. Five remote access workstations were provided. The Real-Time Traffic Adaptive Control System was field tested on a 16-signal corridor as part of the project.

Project Location: Fairfax County, Virginia

Partner(s): Virginia DOT

Start Date: July 1993

***End Date*:** February 1999

Estimated Total ITS Funds: $5,250,000

Estimated Total Project Cost: $24,000,000

***Contacts*:**

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357

OPERATIONAL BASELINING AND TEST SCOPING FOR HURRICANE EVACUATIONS

Description:

This project laid the foundation for FHWA to take a stronger leadership role in encouraging better coordination of transportation management activities during hurricane events. The findings and support from these tasks will give FHWA the necessary knowledge and understanding to proceed with a Field Operational Test of new ITS technologies and/or the integration of existing technologies in or among multiple States to improve transportation operations during evacuations. There were three parts to this project:

1. Documenting the state-of-the-practice for evacuation transportation management.
2. Developing guidelines for deployment/integration planning.
3. Providing general program support, including outreach to States.

Project Location: Southeastern U.S.

Contractor(s): SAIC

Start Date: August 2001

***End Date*:** September 2002

Estimated Total ITS Funds: $100,000

Estimated Total Project Cost: $136,000

***Contacts*:**

Brandy Hicks	FHWA Headquarters - HOTO	(202) 366-6598

PHOENIX, ARIZONA AZTECH MODEL DEPLOYMENT INITIATIVE

Description:

The Phoenix AZTech Model Deployment Initiative integrated the Trailmaster Freeway Management System, seven local area city Traffic Signal Operations (TOCs) along identified priority corridors, City of Phoenix Public Transit Department management and dispatching system, Maricopa County Emergency Management System, Sky Harbor International Airport management/information system and electronic fare systems associated with the City of Phoenix Public Transit Department and Sky Harbor International airport for a truly regional, multimodal transportation management system. This was accomplished by adding hardware to, and modifying software within local TOCs to accommodate interoperability and extending the communications from Trailmaster to the local TOCs. In addition, the corridors were instrumented with additional sensors and incident detection (CCTVs) to support the measurement of traffic volume, flow rate and the rapid detection and clearance of incidents.

As part of the Model Deployment Initiative, the City of Phoenix Public Transit instrumented their transit vehicles with Automatic Vehicle Location (AVL) so that these vehicles can be used as traffic probes and to monitor schedule adherence.

The Model Deployment Initiative developed a traveler information system to collect, fuse, package and deliver multimodal traveler information to the public via a variety of mechanisms. Jurisdictional ITS linkages utilizing the Arizona DOT (ADOT) communications network provided sharing of corridor status, travel times, hazard information and corridor closure information among state, county and city systems. The AZTech Integrated Regional Traveler Information Center was established at the ADOT TOC and was developed by TRW.

ETAK, with its partner Metro Networks, Inc., managed AZTech, and promoted business development of fee paying clients. Distribution channels include dial-up telephone (free), public kiosk (free), INTERNET (free, except for access fee paid by users), for-fee cellular, for-fee paging, and for-fee interactive cable TV. The public is receiving the benefit of for-fee distribution of traveler information via Metro Networks traffic center to broadcast TV, cable TV, and radio stations. For those broadcast TV and radio stations desiring standard traveler information only available from public sources, it is being made available through existing ADOT interface to broadcast stations. Traveler information includes corridor, public transit, and airport information, as well as electronic Yellow Pages supplied by commercial clients.

Evaluation, training, public relations, education and outreach were also being carried out under Model Deployment Initiative efforts.

The Phoenix AZTech Model Deployment Initiative was operational by July 1998. A year and a half of data collection followed to evaluate the benefits of an integrated metropolitan area ITS infrastructure. The final evaluation report is available on the JPO Electronic Document Library at http://www.its.dot.gov/welcome.htm.

Project Location:

Phoenix, Arizona

Partner(s):

Arizona DOT, Maricopa County, Cities of Phoenix, Tucson, Chandler, Glendale, Mesa, Scottsdale and Tempe; Regional Public Transit Authority, Phoenix Transit Department, Maricopa Association of Governments, Pima Association of Governments, Arizona State University, Sky Harbor International Airport, TRW Transportation Systems, Scientific Atlanta, Inc., and the Etak Team (which may include the following companies: Metro Networks, CUE Paging Corp., Differential Corrections, Inc., SEIKO Communications, Inc., SkyTel, Hewlett Packard, Fastline, Clarion, Delco Electronics, Volvo, IT Network, and ATT)

Start Date: October 1996

***End Date*:** December 2000

Estimated Total ITS Funds: $7,520,000

Estimated Total Project Cost: $18,450,000

Contacts:

Alan Hansen	FHWA Arizona Division, HPR 1- AZ	(602) 379-3645	Ext. 108
Dale Thompson	Maricopa County, AZ	(602) 506-8949	

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.

Project Location: Portland, Oregon

Contractor(s): Tri-Met of Portland, Oregon

Start Date: September 1990

***End Date*:** September 1993

Estimated Total ITS Funds: $54,000

Estimated Total Project Cost: $90,000

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678

RAILROAD CROSSING VEHICLE PROXIMITY ALERT SYSTEM

Description: The Vehicle Proximity Alert System (VPAS) is designed to warn drivers of priority vehicles (emergency vehicles, school buses, hazardous material haulers) about the presence of approaching trains at highway-rail grade crossings. This alert is activated via an in-vehicle warning (audio/visual). Testing and evaluation of several selected prototype systems for system performance and reliability have been completed. This was accomplished at the Transportation Technology Center (TTC) test track facilities in Colorado. An evaluation report was delivered in April 2001.

Project Location: Pueblo, Colorado

Partner(s): Smart Stops Unlimited., Inc., E.A.R.S., Dynamic Vehicle Safety Systems and the Federal Railroad Administration

Start Date: June 1995

***End Date*:** April 2001

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,000,000

***Contacts*:**

James Smailes	FRA Headquarters, RDV-11	(202) 493-6360

REAL-TIME TRAFFIC ADAPTIVE SIGNAL CONTROL FOR ITS

Description: This study, to develop a prototype real-time, traffic adaptive signal control system suitable for use in an ITS environment by 1997, was the first of three studies which eventually developed five prototypes for laboratory evaluation, from which one was selected for further development and field evaluation by 1997. This study encompassed 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.

Project Location: Rockville, Maryland

Contractor(s): PB Farradyne, Inc.

Start Date: June 1992

***End Date*:** December 1998

Estimated Total ITS Funds: $4,832,537

Estimated Total Project Cost: $4,832,537

***Contacts*:**

Deborah Curtis	FHWA - TFHRC, HRDO-03	(202) 493-3267

RESEARCH AND ANALYSIS SUPPORT FOR THE ITS PROGRAM

Description:

This was an inter-agency agreement to provide support services for the FHWA ITS R&D program by the Oak Ridge National Laboratory (ORNL). Through this umbrella, parent contract, ORNL staff provided technical assistance in the development of ITS R&D programs, assisted in the evaluation of proposal and contract deliverables, developed prototypes to determine the feasibility of high-risk research projects, and assisted in the coordination of ITS-related research external to FHWA.

Separate project reports are available for the following tasks performed under this contract under the following titles:

- ITS Deployment Analysis System (IDAS) - The objective of IDAS is to develop a sketch planning tool for use in assessing the incremental costs and benefits of adding ITS technology applications to a regional transportation network. IDAS uses outputs from traditional planning models to establish a baseline on which ITS-based capabilities may be added.
- Development of Interactive Traffic Network Data Editor for the Integrated Traffic Simulation System (ITRAF) - The objective of ITRAF is the development of a user-friendly input data pre-processor for two traffic simulation models developed by FHWA: CORSIM and CORFLO.
- Freeway System Capacity and Level of Service Analysis - This project developed a new methodology to calculate the capacity and level of service for freeway systems and to prepare the appropriate chapter for the Highway Capacity Manual 2000.
- Special Report on Traffic Flow Theory - This task expanded and updated Transportation Research Board Special Report 165 titled "Traffic Flow Theory" published in 1975. This revision provided an updated survey of the most important models and theories which characterize traffic flows.

Project Location: Oak Ridge, Tennessee

Contractor(s): Department of Energy; Oak Ridge National Laboratory

Start Date: October 1994

End Date: November 2001

Estimated Total ITS Funds: $8,544,417

Estimated Total Project Cost: $8,544,417

Contacts:

Henry Lieu	FHWA - TFHRC, HRDO-03	(202) 493-3273

THE ROLE OF FHWA IN IN-VEHICLE GUIDANCE INFORMATION AND WARNINGS

Description: The purpose of this project was to explore the relationship and issues between internal drive information and external drive information in support of producing a seamless cognitive perspective to ensure efficient and effective decision-making for both navigation and avoidance of incidents.

Project Location: Seattle, Washington

Contractor(s): Battelle

Start Date: March 2002

***End Date*:** September 2002

Estimated Total ITS Funds: $56,360

Estimated Total Project Cost: $56,360

***Contacts*:**

Michael Moyer	FHWA - TFHRC, HRDS-07	(202) 493-3370
Tom Granda	FHWA - TFHRC, HRDS-07	(202) 493-3365

SACRAMENTO RIDESHARE

Description: The Sacramento Real-Time Ridesharing project used a geographic information system (GIS) to provide single-trip or multiple-trip real-time ridesharing information. A driver seeking a rider entered the request into the system through one of the transportation management associations (TMAs). A prospective rider entered a destination and ride request. Driver incentives were also identified in the implementation of the system.

Project Location: Sacramento, California

Partner(s): Division of New Technology and Research of the California DOT (Caltrans), Sacramento Rideshare, Transportation Management Associations (TMA), Sacramento Council of Governments, and Volpe National Transportation Systems Center

Start Date: January 1993

***End Date*:** December 1995

Estimated Total ITS Funds: $204,000

Estimated Total Project Cost: $825,000

***Contacts*:**

Ron Boneau	FTA Headquarters, TRI-11	(202) 366-0195
Cliff Loveland	CalTrans	(916) 654-9970

SALT LAKE CITY INTERIM TRAFFIC OPERATIONS CENTER

Description: This project consisted of the development of an interim Traffic Operations Center (TOC) which was located at the site where the planned Salt Lake City Traffic Control Center will ultimately be located. The interim TOC supported the operation of the Utah DOT, Salt Lake County and Salt Lake City signal systems and the freeway management system to facilitate travel during the reconstruction of I-15 in the Salt Lake City area. The I-15 reconstruction project included installation of the ultimate Utah DOT freeway management system for the area.

Project Location: Salt Lake City, Utah

Partner(s): Utah DOT, Salt Lake City, Salt Lake County

Start Date: October 1997

***End Date*:** December 1998

Estimated Total ITS Funds: $1,500,000

Estimated Total Project Cost: $1,875,000

***Contacts*:**

Russell Robertson	FHWA Utah Division, HPM-UT	(801) 963-0078	Ext. 229
Dave Kinnecom	Utah DOT	(801) 965-4910	

SAN ANTONIO TRANSGUIDE

Description:

The Texas DOT installed a state-of-the-technology advanced traffic management system (TransGuide) in San Antonio. The Phase 1 project resulted in a three story control center and twenty-five miles of the one hundred ninety mile proposed ATMS. TransGuide provides:

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

A $150,000 Before-and-After study for Phase 2 on Loop 410 was added to the project in 1996, extending the completion date for a year.

Project Location:

San Antonio, Texas

Partner(s):

Texas DOT, Allied Signal Technical Services Corporation, Southwest Research Institute (SWRI), and Texas Transportation Institute (TTI)

Start Date:

August 1993

End Date:

March 1998

Estimated Total ITS Funds:

$1,049,654

Estimated Total Project Cost:

$1,485,966

Contacts:

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Pat Irwin	Texas DOT	(210) 731-5249
Gene Schroeder	Texas DOT - TRF (Austin)	(512) 416-3309

SAN ANTONIO, TEXAS TRANSGUIDE METROPOLITAN MODEL DEPLOYMENT

Description:

The San Antonio, Texas metropolitan area Model Deployment builds on the successful TransGuide Operations Center, where the Texas Department of Transportation, the city traffic operations, transit dispatch, police traffic dispatch and police/fire/emergency dispatch are all co-located. The fully integrated TransGuide Model Deployment covers nearly 200 miles of freeways and the majority of streets within the San Antonio metropolitan area. 78,000 vehicles are equipped with Intelligent Vehicle Tags. These tags allow the equipped vehicles to serve as roving "traffic probes," reporting on current travel times throughout the metropolitan area. Real-time, multi-modal traveler information is being provided to the traveling public through TransGuide TV 54, an in-vehicle route guidance system, kiosks, the INTERNET, and highway advisory radio. The TransGuide communications system supports video teleconferencing between local trauma centers and EMS units, providing physicians with the opportunity to see the patient and directly monitor vital statistics at the accident scene and en-route to the hospital.

The San Antonio Model Deployment was fully operational by September 1998. A year and a half of data collection followed to evaluate the benefits of a fully integrated metropolitan area ITS infrastructure. The final evaluation report is accessible on the JPO Electronic Document Library at http://www.its.dot.gov/welcome.htm.

Project Location: San Antonio, Texas

Partner(s): Texas DOT, VIA Metropolitan Transit Authority, City of San Antonio Department of Public Works, City of San Antonio Police Department, City of San Antonio Fire Department, Alpine Electronics Research of America, Amtech Systems Corporation, Southwest Research Institute, Navigation Technologies, Scientific Atlanta, Factura, Zexel USA, and H.B. Zachry

Start Date: October 1996

***End Date*:** May 2000

Estimated Total ITS Funds: $7,144,000

Estimated Total Project Cost: $13,954,500

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Tom Newbern	Texas Department of Transportation	(512) 416-3200
Pat Irwin	Texas Department of Transportation - San Antonio	(210) 731-5249

SANTA CLARA COUNTY SMART VEHICLE

Description: This project used 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 service provided allows disabled travelers to request specific transportation service. A vehicle was routed and, where appropriate, the traveler was transferred to a fixed-route mode. Use is made of AVL technology, demand-responsive dispatching software, and a navigable map database which allows the closest available vehicle nearest a requester to be dispatched.

Project Location: Santa Clara County, California

Partner(s): Division of New Technology and Research of the California DOT (Caltrans), Santa Clara County Transportation Authority, Outreach Paratransit Broker, Trimble Navigation, UMA Engineering, Navigation Technologies, and Volpe National Transportation Systems Center

Start Date: November 1993

***End Date*:** October 1995

Estimated Total ITS Funds: $425,000

Estimated Total Project Cost: $850,000

***Contacts*:**

Ron Boenau	FTA Headquarters, TRI-11	(202) 366-0195
Cliff Loveland	CalTrans	(916) 654-9970

SANTEE WATEREE ROUTE DEVIATION

Description: This project provided improved internal operating efficiencies and reduced costs associated with rural transportation services provided by the Santee Wateree Regional Transportation Authority (SWRTA) in the south central South Carolina counties of Clarendon, Kershaw, Lee, and Sumter; and improved and expanded services to SWRTA customers.

Project Location: Counties of Clarendon, Kershaw, Lee and Sumter, South Carolina

Partner(s): FTA, Santee Wateree Regional Transportation Authority (SWRTA)

Start Date: September 1999

***End Date*:** December 2002

Estimated Total ITS Funds: $275,000

Estimated Total Project Cost: $343,750

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841
Will Davis	SWRTA	(803) 775-9347

SATELLITE COMMUNICATIONS FEASIBILITY

Description: This project evaluated the use of Very Small Aperture Terminal (VSAT) 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 were 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.

Project Location: I-95 in Philadelphia, Pennsylvania

Partner(s): Pennsylvania DOT

Start Date: October 1992

***End Date*:** November 1998

Estimated Total ITS Funds: $2,200,000

Estimated Total Project Cost: $2,520,000

***Contacts*:**

Carmine Fiscina	Philadelphia FHWA Metro Office, PMO-PA	(215) 656-7111
Doug May	Pennsylvania DOT	(610) 768-3053

SCOOT ADAPTIVE TRAFFIC CONTROL SYSTEM

Description: This operational test implemented SCOOT in an area of the City of Anaheim's traffic signal system so that it could 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 also included the installation and evaluation of Video Traffic Detection System (VTDS) cameras in conjunction with the SCOOT system. The VTDS cameras potentially provide a way to adjust the traffic count locations so that optimal data collection sites for the SCOOT system can be identified.

Project Location: Anaheim, California

Partner(s): City of Anaheim, California DOT (CalTrans), Odetics, PATH, CalPoly University, and University of Southern California

Start Date: September 1993

***End Date*:** September 1999

Estimated Total ITS Funds: $1,153,927

Estimated Total Project Cost: $2,438,427

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(916) 498-5005
John Thai	City of Anaheim	(714) 765-5183

SEATTLE SMART TRAVELER

Description: This project examined ways in which mobile communications, such as cellular phones, and information kiosks could be used to make ridesharing (carpooling and vanpooling) more attractive, and evaluated 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 operationally tested a prototype computer-based, interactive commuter information center in an office building in downtown Bellevue. The center provided computerized transit information, rideshare matching, and a method to schedule occasional carpool or vanpool trips. In addition to cellular telephone, the technological applications included voice mail, computer-based ridematching, traffic monitoring computers, and electronic maps.

Project Location: Metropolitan Seattle, Washington

Partner(s): Bellevue Transportation Management Association (TransManage), University of Washington, City of Bellevue, Washington State DOT, and Municipality of Metropolitan Seattle

Start Date: October 1991

***End Date*:** August 1999

Estimated Total ITS Funds: $100,000

Estimated Total Project Cost: $245,000

***Contacts*:**

Ron Boenau	FTA Headquarters, TRI-11	(202) 366-0195
Mark Haselkorn	University of Washington	(206) 543-2577

SEATTLE WIDE-AREA INFORMATION FOR TRAVELERS (SWIFT)

Description: This project tested the delivery of traveler information via three devices: the Seiko Receptor Message Watch, an in-vehicle FM subcarrier radio, and a portable, personal computer. This project also expanded service formerly available under the Bellevue Smart Traveler project.

Project Location: Seattle, Washington

Partner(s): Washington State DOT, Seiko Communications Systems, IBM Corporation, Delco, Etak, Metro Traffic, King County (Washington) Metro Transit, and University of Washington

Start Date: August 1994

***End Date*:** January 1999

Estimated Total ITS Funds: $4,527,000

Estimated Total Project Cost: $7,200,000

***Contacts*:**

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Larry Senn	Washington State DOT	(206) 543-6741

SEATTLE, WASHINGTON SMART TREK MODEL DEPLOYMENT

Description:

The Seattle, Washington Smart Trek Model Deployment Initiative showcases the implementation of the ITS infrastructure to commuters both around the world and especially to the Seattle area residents. The traveling public and local officials are experiencing the benefits of a 21st century transportation system in a real-life setting. The Seattle Smart Trek Model Deployment project provides intermodal transportation management and integrated, real-time highway and transit information services for the entire Seattle metropolitan area.

The Seattle Model Deployment Initiative was operational in December 1997. A year and a half of data collection followed to evaluate the benefits of an integrated metropolitan area ITS infrastructure. The final evaluation report is accessible on the JPO Electronic Document Library at http://www.its.dot.gov/welcome.htm.

Project Location:

Seattle, Washington

Partner(s):

Smart Trek is a coalition of public and private partners joining together to develop this model deployment initiative. The partners include: Bartizan American Communications, Battelle Pacific Northwest Laboratories, Boeing Company, City of Bellevue Transportation Department, David Evans and Associates, Inc., Etak Inc., Fastline, IBI Group, ICON, King County DOT, Metro Traffic Control, Inc., Microsoft, Inc., Pacific Rim Resources, Inc., PB/Farradyne Inc., Seiko Communications Systems, Inc., Puget Sound Regional Council, TRAC-UW, Transportation Division Seattle Engineering Department, University of Washington, Washington State Department of Information Services, Washington State Department of Transportation, XYPOINT Corporation, and Greater Redmond Transportation Management Association

Start Date:

October 1996

***End Date*:**

May 2000

Estimated Total ITS Funds:

$13,688,000

Estimated Total Project Cost:

$54,826,000

***Contacts*:**

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Pete Briglia	Washington State DOT	(206) 543-3331

SMART CALL BOX

Description: This operational test took advantage of the extensive call box system installed on California freeways and sought to increase their functionality by adding an interface to traffic management devices. The project included 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.

Project Location: San Diego, California

Partner(s): San Diego Service Authority for Freeway Emergencies (SDSAFE), California DOT (Caltrans), California Highway Patrol (CHP), and San Diego State University

Start Date: September 1993

***End Date*:** September 1996

Estimated Total ITS Funds: $915,000

Estimated Total Project Cost: $1,607,600

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(916) 498-5005
David Dutcher	CalTrans	(619) 688-4274
Mike Perkins	S. D. Svc Authority for Freeway Emergencies	(619) 694-2190

SMART FLEXROUTE INTEGRATED REAL-TIME ENHANCEMENT SYSTEM (SAFIRES)

Description:

The Potomac and Rappahannock Transportation Commission (known as OmniRide - A ride for All Reasons) conducted an operational test to evaluate an integrated smart vehicle service that includes route-deviation, fixed route, and demand responsive service types. The test site was a suburban-to-rural environment in the Prince William area of Virginia, located twenty-five miles south of Washington, D.C.

Test objectives included: Serving both the general public and disabled populations with a single transit service; assessing the cost effectiveness of route deviation service in a low-density environment; integrating ITS and service innovation into regular transit service; attempting to decrease advance request times; and attempting to reduce vehicle miles traveled (VMT).

Using Intelligent Transportation Systems (ITS) technologies including a global positioning satellite-based (GPS) automated vehicle location (AVL) system, real-time scheduling software, geographic information system (GIS) mapping, and digital communication through mobile data terminals (MDT), the test attempted to integrate route deviation, commuter rail and bus, feeder bus, and human service transportation in a low density environment.

Small, multi-purpose vehicles switched between service types on an as-needed basis, allowing the best vehicle to respond to each request in real-time using the integrated computerized dispatching software developed for the operational test. ITS technologies simplified Section 15 reporting and tracking human service ridership and agency charges. Results reflected improved operational efficiency and enhanced quality of service. Full realization of the potential for integrating systems awaits a working communications system.

Route deviation (up to 3/4 mile) enables the service to reach a far larger market and negate the need for complementary paratransit services required of fixed route systems. Goals of improved cost effectiveness and reduced VMT require full integration.

Project Location: Northern Virginia

Partner(s): Potomac-Rappahannock Transportation Commission (PRTC), Northern Virginia Planning District Commission (NVPDC), Virginia Department of Rail and Public Transportation (VDRPT), GMSI, Inc., Trapeze Software, Inc., and SG Associates

Start Date: January 1994

***End Date*:** August 2002

Estimated Total ITS Funds: $1,214,460

Estimated Total Project Cost: $5,134,071

Contacts:

William Wiggins	FTA Headquarters, TRI-11	(202) 366-0255	
Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357	
Eric Marx	PRTC	(703) 490-4811	Ext. 117

SOUTHERN CALIFORNIA ITS PRIORITY CORRIDOR

Description:

Transportation agencies within the Southern California Priority Corridor organized into four coalitions generally bounded by the jurisdictions of the California Department of Transportation (CalTrans) Districts 7, 8, 11, and 12. These coalitions are called Regional ITS Coordinating Teams. Each team provides representatives to the Corridor Steering Committee. The teams work at the management level to formulate plans, strategies and project lists to present to their respective constituents and parent organizations; set priorities, facilitate and consider the endorsement of publicly funded ITS projects within the region. Membership generally represents CalTrans district, city, county, Metropolitan Planning Organization, transit agency, Highway Patrol, and Air Quality Management District.

The Corridor Steering Committee was the forum to address corridor-wide user services, functional requirements, architecture and standards to ensure compatibility as deployments progress and merge at regional boundaries. The Committee provides an interactive point of contact for other California and ITS planning efforts.

Three major categories of activity comprised the Southern California Corridor. Operational tests, strategic deployment and planning, and a major demonstration of an intermodal transportation management and information system known as "Showcase".

Projects encompassed by the Southern California Corridor included:

- Integrated Ramp Metering/Adaptive Signal Control
- SCOOT Adaptive Traffic Control System
- Mobile Communications System
- Smart Call Box
- Spread Spectrum Radio Traffic Interconnect
- SMART Corridor
- Los Angeles Smart Traveler
- Ontario Smart Vehicle (ATHENA) - Phase I Demonstration developed a preliminary design for a demonstration of door-to-door shared rides using 100 vans equipped with "Smart Technology" and evaluated technologies and interfaces, leading to a procurement to implement the actual demonstration.

Strategic Planning - A strategic deployment planning study in the broadly defined Southern California Priority Corridor evaluated and identified the technologies to be programmed for deployment, and define an architecture that was consistent with the national ITS architecture. The planning study began in 1995 and was completed in mid-1997.

"Showcase" Intermodal Transportation Management and Information System (ITMIS) and Early Start Projects - The ITMIS project deployed an intermodal transportation management and information system to optimize and coordinate freeway and street operations with public and private transportation systems within the corridor. Cooperative efforts were established in areas such as system management, transportation demand management, transportation provision and fleet management.

Traveltip, the first ITMIS project developed and deployed under the Showcase initiative, was in fiscal year 1995 and provided for an interregional multimodal advanced traveler information system in the Orange County region. The project deployed technology to improve traffic and transit operations, and provide information to transportation managers, travelers, and third party users to enhance decisions on transportation management, route selection, and mode choice. Traveltip was basically a smaller version of what is envisioned for the entire corridor, and was completed in May 2000.

The Showcase concept identified early-start projects in addition to the main priority of developing a corridor-wide ITMIS. Planning for Phase I was completed in January 1997, and Interface Development for Phase II was completed in August 1999. Four San Diego-area projects were also initiated in FY 1995 with scheduled completions as follows: Transit Management Information System (March 2000); Computer-Aided Dispatch (December 1999); Jack Murphy Stadium Traveler and Traffic Info System (December 2000); and San Diego Intermodal TMC (December 2001).

Project Location: Southern California: This area lies within major urbanized and adjacent non-urbanized areas of Ventura, Los Angeles, San Bernadino, Riverside, and San Diego Counties and all of Orange County.

Partner(s): Steering Committee: Caltrans Headquarters New Technology, CalTrans District 7, Caltrans District 8, CalTrans District 11, CalTrans District 12, Southern California Association of Governments, San Diego Association of Governments, San Bernardino Association of Governments, Orange County Transportation Authority, City of San Diego, California Highway Patrol, and the South Coast Air Quality Management District

Start Date: January 1993

***End Date*:** September 1997

Estimated Total ITS Funds: $28,314,000

Estimated Total Project Cost: $35,473,000

Contacts:

Gloria Stoppenhagen	FHWA LA Metro Office	(213) 202-3955
Ali Zaghari	Caltrans, New Technology	(949) 724-2940
Randy Woolley	Caltrans, New Technology	(949) 756-4930

SPREAD SPECTRUM RADIO TRAFFIC INTERCONNECT

Description: This operational test evaluated the use of spread spectrum radio to provide communications interconnect for a portion of the Los Angeles ATSAC signal system. The radios were tested in a network of signals to determine their ability to work in a variety of geographies and their ability to provide for large-scale, once-per-second communications, and to determine the cost-effectiveness of using this technology.

Project Location: Los Angeles, California

Partner(s): City of Los Angeles, Hughes Aircraft, JHK & Associates, California DOT (CalTrans), University of Southern California, and PATH

Start Date: July 1994

***End Date*:** April 1999

Estimated Total ITS Funds: $2,629,075

Estimated Total Project Cost: $3,866,685

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(916) 498-5005
Shawn Skehan	LA/ATSAC	(213) 485-2815

SUBURBAN MOBILITY AUTHORITY FOR REGIONAL TRANSPORTATION (SMART) PROJECT

Description: This project provided 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 were extended to affiliated agencies. The project also established an 800 number, interfaced with the dispatch system with potential to refer customers to regional paratransit services. The project also developed interfaces with other ITS initiatives in the region, including FAST-TRAC and Michigan DOT's Metropolitan Transportation Center. The project also provides for innovative Traveler Information Services, to tie other uses together. Project reports have been submitted.

Project Location: Detroit, Michigan

Partner(s): Suburban (Detroit) Mobility Authority for Regional Transportation (SMART) and Michigan DOT

Start Date: February 1994

***End Date*:** December 2001

Estimated Total ITS Funds: $12,000,000

Estimated Total Project Cost: $15,000,000

***Contacts*:**

Morris Hoevel	FHWA Michigan Division, HDA-MI	(517) 702-1834
Kimberly Johnson	Michigan DOT	(517) 373-8796
Steven Fern	SMART	(248) 362-4633

SUPPORT SERVICES FOR THE FHWA HUMAN FACTORS PROGRAMS - PHASE I

Description: This contract provided support to FHWA's Human Factors Team to monitor off-site research contracts and conduct on-site research in the Turner-Fairbank Highway Research Center (TFHRC) Human Factors Laboratory facilities. A significant portion of the off-site contract research involved Intelligent Transportation Systems (ITS) studies. These were in the areas of Advanced Traveler Information Systems (ATIS), In-Vehicle Information Systems (IVIS), and Advanced Traffic Management Systems (ATMS). Likewise, a large portion of the on-site research involved ITS studies. These were in the areas of ATIS, IVIS, ATMS and the integration of in-vehicle information with information coming from outside of the vehicle. The major products of this effort were ITS-related research reports, inputs to ITS design guidelines and standards, and inputs to ITS-related traffic models.

Project Location: McLean, VA

Contractor(s): Science Applications International Corporation (SAIC)

Start Date: September 1998

***End Date*:** September 2002

Estimated Total ITS Funds: $1,600,000

Estimated Total Project Cost: $8,000,000

***Contacts*:**

Tom Granda	FHWA - TFHRC, HRDS-07	(202) 493-3365

SYRACUSE CONGESTION MANAGEMENT SYSTEM

Description: This project implemented a central, computer-controlled signal system for the Syracuse central business district.

Project Location: Syracuse, New York

Partner(s): New York State DOT, Syracuse Department of Public Works

Start Date: June 1996

***End Date*:** February 2001

Estimated Total ITS Funds: $3,000,000

Estimated Total Project Cost: $10,814,575

***Contacts*:**

Jerry Zell	FHWA New York Division, HTS-NY	(518) 431-4125	Ext. 228
Ed Roberts	New York State DOT	(518) 457-1232	

TRAFFIC RESEARCH LABORATORY (TREL)

Description: The TReL is an ATMS testbed which integrates research and development tools into a seamless analysis environment. This project used the TreL testbed to address crucial issues in ATMS such as: the impact of incident detection upon level of service, the effects of dynamic traffic assignment, and system integration issues to help guide ATMS deployment. The Phase I testbed was completed in 1995. It provided the research and analysis capabilities needed to help quantify the benefits of ITS deployment and answer initial critical issues. The Phase II testbed provides real-time and faster than real-time simulation capabilities to support emulation of an actual advanced traffic management control center. The Phase II testbed answers questions such as how to design and implement the functionality of the ATMS control center.

Project Location: Colorado Springs, Colorado

Contractor(s): ITT Systems

Start Date: September 1993

***End Date*:** September 1997

Estimated Total ITS Funds: $3,000,000

Estimated Total Project Cost: $3,000,000

***Contacts*:**

Raj Ghaman	FHWA - TFHRC, HRDO-03	(202) 493-3270

TRAFFIC SURVEILLANCE AND DETECTION TECHNOLOGY DEVELOPMENT

Description: This funding was 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 ITS-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 identified 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. This project was conducted in two phases. The first phase was an effort to adapt various sensor technologies for use in transportation detection applications. The second phase was an effort to conduct testing to determine the relationships between the data the sensor can provide and the performance of ATMS functions alone and integrated. In order to identify performance relationships between function/sensor combinations, part of phase two investigated the integration of data from these advance sensors with various ATMS functions.

Project Location: Pasadena, California

Contractor(s): Jet Propulsion Laboratory (JPL)

Start Date: September 1994

***End Date*:** September 1999

Estimated Total ITS Funds: $7,240,000

Estimated Total Project Cost: $7,240,000

***Contacts*:**

Deborah Curtis	FHWA - TFHRC, HRDO-03	(202) 493-3267

TRANSIT COMPUTER TOOLS

Description: This project evaluated computer reservation, dispatching, and billing services for small urban and rural transit operations. Additionally, it identified user records, compared products, and operational inputs and assessed combinations of hardware and software, and investigated procurement guidelines.

Project Location: Raleigh, NC

Contractor(s): North Carolina State University

Start Date: September 1996

***End Date*:** May 1999

Estimated Total ITS Funds: $100,000

Estimated Total Project Cost: $100,000

***Contacts*:**

Sean Ricketson	FTA Headquarters, TRI-11	(202) 366-6678
John Stone	North Carolina State University	(919) 515-7732

TRANSIT NETWORK ROUTE DECISION AID

Description: This project developed 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; investigated algorithms and discussed how to extend or specialize them; and developed a plan for decision aid evaluation.

Project Location: Ann Arbor, Michigan

Contractor(s): University of Michigan - Department of Industrial Operations and Engineering

Start Date: September 1991

***End Date*:** October 1993

Estimated Total ITS Funds: $70,000

Estimated Total Project Cost: $70,000

***Contacts*:**

Chelsea White	University of Michigan	(313) 763-5464

TRANSIT TECHNOLOGY RESEARCH

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

Project Location: Cambridge, Massachusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: October 1993

***End Date*:** December 1994

Estimated Total ITS Funds: $160,000

Estimated Total Project Cost: $160,000

***Contacts*:**

Ron Boenau	FTA Headquarters, TRI-11	(202) 366-0195
Bob Ow	Volpe National Transportation Systems Center	(617) 494-2411

TRANSLINK RESEARCH AND DEVELOPMENT PROGRAM

Description: This project, conducted under the auspices of ITS Research Centers of Excellence program, was designed to facilitate the integration of "real-time" ITS system monitoring capabilities into existing and future transportation management systems. Areas of emphasis for TRANSLINK research included linkages between ITS subsystems such as advanced traffic management systems and transit management systems. There was specific focus on railroad integration with ATMS and ATIS systems and police vehicle subsystem integration with enforcement/response center systems. There was also research emphasis on transportation center automation and support of simulations and modeling. This project established the basis for TRANSLINK, an ongoing project focused on integrating the various components of surface transportation systems.

Project Location: College Station, Texas

Contractor(s): Texas A & M, Metropolitan Transit Authority of Harris Co., Texas DOT

Start Date: March 1996

***End Date*:** September 1998

Estimated Total ITS Funds: $1,200,000

Estimated Total Project Cost: $1,200,000

***Contacts*:**

David Gibson	FHWA - TFHRC, HRDO-04	(202) 493-3271

TRANSMIT

Description:

The "TRANSMIT" (TRANSCOM's System for Managing Incidents and Traffic) Operational Test evaluated the use of automatic vehicle identification (AVI) technology as an incident detection tool. The system of AVI "tag" readers allows vehicles equipped with transponders to serve as traffic probes. Tag-equipped probe vehicles are assigned a random identification number as they enter a system populated with AVI readers spaced approximately 2 kilometers apart. Software analysis is 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.

Project Location:

Rockland County, New Jersey/Bergen County, New Jersey

Partner(s):

New Jersey DOT, New York State Thruway Authority, New Jersey Highway Authority, TRANSCOM

Start Date:

April 1993

***End Date*:**

March 1998

Estimated Total ITS Funds:

$2,750,000

Estimated Total Project Cost:

$3,437,500

***Contacts*:**

Keith Sinclair	FHWA New Jersey Division, HTC-NJ	(609) 637-4204
Tom Batz	TRANSCOM	(201) 963-4033

TRAVINFO

Description: The TravInfo project implemented a comprehensive, region-wide traveler information system, capable of supplying transportation information to a broad array of devices and users. TravInfo includes the development and operation of a multi-modal transportation information center that integrates 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 pursues an "open-access" architecture for all aspects of the system to provide for future growth and facilitate the transfer of technology.

Project Location: San Francisco Bay Area, California

Partner(s): California DOT (CalTrans), Bay Area Ad Hoc ITS Committee, PATH, and Metro Transportation Commission

Start Date: April 1993

***End Date*:** May 2000

Estimated Total ITS Funds: $5,072,000

Estimated Total Project Cost: $7,347,000

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(916) 498-5005
Melanie Crotty	Metro Transportation Commission	(510) 464-7708

TRAVLINK

Description: TravLink implemented an Advanced Traveler Information System and Advanced Public Transportation System along the I-394 corridor extending from downtown Minneapolis, approximately 12 miles to the west. TravLink is a part of the Minnesota Guidestar ITS program and provided real-time transit schedule and traffic information through a combination of kiosks and terminals at work, home, shopping centers, and transit stations.

Project Location: Minneapolis, Minnesota

Partner(s): Minnesota DOT, St. Paul Metropolitan Council Operations, US West, 3M-Renix, City of Minneapolis, University of Minnesota

Start Date: September 1992

***End Date*:** October 1996

Estimated Total ITS Funds: $4,116,000

Estimated Total Project Cost: $6,956,000

***Contacts*:**

Jim McCarthy	FHWA Minnesota Division, HDA-MN	(651) 291-6112
Marilyn Remer	Minnesota DOT Program Manager	(651) 582-1601

TRAVTEK

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. TravTek rental operations began in March 1992. The operations phase ended in March 1993. The data collection for project evaluation is completed. Eight final evaluation reports were made available in late 1995. A video has been developed to disseminate information on the TravTek evaluation project. The video serves as an executive summary for the project, providing information on the overall project goals and objectives, the public/private partnership created to carry out the effort, the system design approach, the key evaluation questions, and finally a summary of the results from the evaluation activities. The video was developed for FHWA by SAIC in consultation with the TravTek partners. In addition to the TravTek partners, the National Highway Traffic Safety Administration participated in the TravTek evaluation. All reports have been completed.

Project Location: Orlando, Florida

Partner(s): City of Orlando, Florida DOT, General Motors/Hughes, and American Automobile Association (AAA)

Start Date: January 1990

***End Date*:** March 1996

Estimated Total ITS Funds: $4,200,000

Estimated Total Project Cost: $12,000,000

***Contacts*:**

Chung Tran	FHWA Florida Division, HDA-FL	(850) 942-9579
Jim Arnold	FHWA - TFHRC, HRDO-04	(703) 285-2974

TRILOGY

Description: The Trilogy project is part of the Minnesota statewide ITS program, Guidestar. Trilogy provides traveler information through different communications techniques: the Radio Broadcast Data System-Traffic Message Channel (RBDS-TMC), and a high-speed FM subcarrier. The primary objective of Trilogy was to test and compare a range of user devices and evaluate the potential improvement in efficiency of the existing transportation network. These devices provide end users with area and route-specific en-route advisories on the highway operating conditions in the Twin Cities Metropolitan Area.

Project Location: Twin Cities Metropolitan Area

Partner(s): Minnesota DOT, AB Volvo, DCI, Sieko Communications Systems, and Indikta Displays

Start Date: July 1994

***End Date*:** May 1999

Estimated Total ITS Funds: $2,776,000

Estimated Total Project Cost: $4,080,000

***Contacts*:**

Jim McCarthy	FHWA Minnesota Division, HDA-MN	(651) 291-6112
Gary Hallgren	Minnesota DOT - Metro Division	(651) 341-7500

WASHINGTON METROPOLITAN TRAVELER INFORMATION SERVICES PROJECT: REGIONAL IMPACTS MODELING

Description: This project measured the region-wide benefits of deploying the Washington Metropolitan Traveler Information Services Project. It also created a model methodology for benefit estimation.

Project Location: Washington, DC Metropolitan Area

Contractor(s): Virginia DOT/George Mason University

Start Date: April 1997

***End Date*:** December 2001

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Thomas Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
Jim Robinson	Virginia DOT-Richmond	(804) 786-6877
Roger Stough	George Mason University	(703) 993-2268

WASHINGTON, D.C. ADVANCED FARE MEDIA

Description:

The purpose of this project was to develop and demonstrate an advanced Integrated Fare Collection System that would employ advanced technologies, improve security, and allow the sale and use of long term transit pass while assuring reliability and security against fraudulent abuse. Washington Metro Area Transit Authority (WMATA) selected Cubic's Go-Card System, a proximity reader/encoder that activates the fare gates when the passenger holds the pass within inches of the reader. The fare media also accommodated debiting the card on exiting the system and having the capability to integrate the fare collection system throughout the Authority by allowing passengers to use the same fare media to pay for Metrorail, Metrobus, and parking. The new system was installed in both directions of at least two aisles on as many as possible of the 93 mezzanines at the 70 stations. The system worked in conjunction with, or in addition to, the equipment currently being used and did not reduce the capabilities of the existing equipment.

Fare collection equipment has been installed at 29 Metro stations, on 21 buses and at 5 parking lots. The system was installed and put into operation February 6,1995, for a one year demonstration period.

Project Location: Washington, DC metropolitan area

Partner(s): WMATA and Cubic

Start Date: December 1994

***End Date*:** February 1996

Estimated Total ITS Funds: $997,899

Estimated Total Project Cost: $997,899

***Contacts*:**

Irv Chambers	FTA Headquarters, TRI-11	(202) 366-0238
Ramon Abromovich	Washington Metropolitan Area Transit Authority	(202) 962-5274

WINSTON-SALEM MOBILITY MANAGEMENT

Description: This project defined and identified system needs and operationally tested and evaluated a mobility management system for the City of Winston-Salem. It included automated scheduling and demand-responsive, shared-ride transit for the young, elderly, and disabled who are unable to use fixed-route transit (Phase I). The project extended the transportation service to fixed-route transit, ridesharing and taxis used by the general public (Phase II). Integration with the Winston-Salem traffic management program was accomplished. Technologies being investigated also include smart cards, GPS, and automatic vehicle location.

Project Location: Winston-Salem, North Carolina

Partner(s): Winston-Salem Transit Authority (WSTA), City of Winston-Salem, North Carolina DOT, and North Carolina State University's Institute for Transportation Research and Education

Start Date: May 1993

***End Date*:** September 1995

Estimated Total ITS Funds: $220,000

Estimated Total Project Cost: $275,000

***Contacts*:**

Ron Boenau	FTA Headquarters, TRI-11	(202) 366-0195
John Stone	North Carolina State University	(919) 515-7732

WINSTON-SALEM MOBILITY MANAGEMENT - PHASE II

Description: This project supports the implementation by the city of Winston-Salem, NC, of mobility management service throughout the city's paratransit fleet of nineteen (19) vehicles, and links the mobility management service to the city's 58-vehicle fixed-route bus service. Mobility management services and system specifications were defined for the coordination of paratransit and fixed-route transit. Hardware and software were obtained and installed for operational testing and continued use.

Project Location: Winston-Salem, North Carolina

Partner(s): Winston-Salem Transit Authority (WSTA), City of Winston-Salem, North Carolina DOT, and North Carolina State University's Institute for Transportation Research and Education

Start Date: June 1996

***End Date*:** July 2001

Estimated Total ITS Funds: $240,000

Estimated Total Project Cost: $300,000

***Contacts*:**

William Wiggins	FTA Headquarters, TRI-11	(202) 366-0255
Suzanne Tellechea	Winston-Salem Transit Authority	(336) 727-2648
John Stone	North Carolina State University	(919) 515-7732

III. RURAL AND STATEWIDE INFRASTRUCTURE

III. RURAL AND STATEWIDE ITS INFRASTRUCTURE

The rural areas of the United States account for a small and dispersed portion of the nation's population, yet they encompass a significant portion of the transportation system. Rural areas account for 80% of the total U.S. road mileage and 40% of the vehicle miles traveled. Residents of these areas are confronted with significantly greater travel distances in accomplishing routine tasks. The rural setting is characterized by long distances, relatively low traffic volumes, infrequent congestion, travelers unfamiliar with the surroundings, and rugged terrain in remote areas. Features of the rural environment include a high representation of fatal crashes; approximately 60% of crash fatalities and 55% of work zone fatalities occur in diverse rural settings which can vary from portions of the high speed interstate highway system to remote, two lane rural roads. Throughout the rural environment, response times for Emergency Medical Services are increased.

For those citizens who do not possess independent means of transportation, the availability and reliability of public transportation are even more crucial than in urban areas. Of the 90 million estimated residents of rural areas, 30 million have special needs by virtue of being elderly, being classified as working poor or persons with disabilities. In excess of 1200 rural transit organizations currently provide travel services to citizens in these categories.

The rural ITS program seeks to satisfy the requirements of a diverse population of users and operators by advancing flexible options which facilitate safety, security, and improved access to transportation services in rural areas. The major challenges in delivering transportation services in a rural/statewide setting include the diversity of conditions in rural travel, the different categories of travelers and their needs, and costs associated with maintaining systems.

Early ITS efforts were driven by the compelling transportation problems in urban areas and interurban corridors. While many of the technologies and systems applied to solving urban problems are also effective outside of urban settings, the market structure, application logistics, and motivating factors underlying their deployment vary considerably from urban to rural areas.

U.S. DOT's vision for Rural and Statewide ITS Infrastructure is described in the National Intelligent Transportation Systems Program Plan – Five-Year Horizon dated August 2000. This plan articulates the program strategies to be employed in fostering implementation of intelligent rural infrastructure. The rural ITS program was initially shaped by a strategic plan developed in 1995 that defined seven critical program areas. Since that time, the rural program structure has evolved in terms of development tracks as a means of organizing research, development, and testing activities. U.S. DOT is in the process of continuing the process of defining these program structural elements as deployment of rural infrastructure expands with the aim of ultimately being able to track infrastructure deployments in a systematic way. The Transportation Equity Act for the 21st Century (TEA-21) fosters rural deployment through the TEA-21 ITS Deployment Program which encompasses the ITS Integration Program whose goal is to increase integration and interoperability of ITS systems in metropolitan and rural areas.

The technical development tracks cover the diversity of the rural transportation system and the breadth of the rural ITS program. These tracks are listed below accompanied by summary definitions. For the purposes of this document, the tracks provide an organizational structure

for grouping the rural ITS projects. One additional category has been added-Integrated Systems. Although not a development track, it is needed to accommodate those projects whose design incorporates the integrated deployment of systems providing multiple services such as weather and regional traveler information.

- **Surface Transportation Weather and Winter Mobility** - Consists of technologies which alert drivers to hazardous conditions and dangers, and include wide-area information dissemination of site-specific safety advisories and warnings. These applications improve the availability of weather information to assist decision makers improve transportation operations affected by weather.

- **Emergency Services** - Systems which improve emergency response to serious crashes in rural areas including technologies that automatically mobilize the closest police, ambulances, or fire fighters in cases of collisions or other emergencies, even in the most remote locations.

- **Statewide/Regional Traveler Information Infrastructure** - These components provide information to travelers who are unfamiliar with the local rural area and the operators of transportation services. This infrastructure supports services which can be provided at specific locations, en-route, or well in advance of the traveler's destination.

- **Rural Crash Prevention** - Focuses on the prevention of crashes before they occur, as well as on reducing crash severity. Rural areas are recognized for their unique environments and frequently for rugged terrain. They present additional hazards for drivers such as flawed road geometry/structure, hazards leading to road departure, adverse weather and unexpected encounters such as rock falls and animals. Through examination of rural travelers' needs, crash prevention measures and advanced technologies will be identified for implementation.

- **Rural Transit Mobility** - These services strive to improve the efficiency of rural transit services and their accessibility to rural residents. Advanced vehicle locating devices and communications systems can help achieve better scheduling, improved dispatching, smart card payment transactions, and advanced ridesharing and ride-matching systems. These systems also improve the efficiency of other rural fleets, such as snowplows and even law enforcement vehicles, through advanced vehicle tracking and on-board equipment monitoring systems.

- **Rural Traffic Management** - Strives to identify and implement multi-jurisdictional coordination, mobile facilities and simple solutions for small communities and operations in areas where utilities may not be available. Emphasis on research will be placed on systems to perform surveillance, control and communication to meet rural needs.

- **Highway Operations and Maintenance** - Leverage technologies that improve the ability of our highway workers to maintain and operate rural roads. These include severe weather information systems, early detection of pavement and bridge failures, and immediate detection of dangers to work zone crews.

- **Integrated Systems** – This is not a development track, but is a classification in the taxonomy which accommodates rural ITS projects which have integrated existing infrastructure, or are deploying integrated infrastructure.

These development tracks inherently place emphasis on specific user needs. Statewide/Regional Traveler Information Infrastructure for example refers to the infrastructure and systems support that a visitor (both driver and passenger) unfamiliar with a rural area may require as well as the Visitors and Tourism Bureaus, transit service providers, information providers, etc., that provide the services to meet their needs. In a tourist resort area, this may be the main focus of the ITS program. In other areas such infrastructure may exist, but plays a smaller role. Likewise, the Rural Transit Mobility Service focuses on reducing the isolation of the transportation disadvantaged and increasing the mobility of all. Its constituents also include both the potential travelers and service providers. Because of the costs of the provision of services in rural areas, the operations and maintenance activities may also form their own divisions. As ITS services are shown to reduce the cost of these services and improve their efficiency, these areas and the organizations responsible for providing them become natural constituents and advocates for the programs.

ITS applications such as incident notification (cellular and Mayday), advanced hazard warning systems, advanced traveler information services, and in-vehicle crash avoidance systems, are some of the ITS applications which can address the issues affecting rural transportation, and significantly impact the safety and mobility of rural travelers. Other ITS R&D programs within NHTSA and FHWA have substantial rural components--that is, they examine crash avoidance/warning, traveler information, vehicle control, automated roadway, or other safety technologies that have primary applications in improving rural safety.

An additional innovation is the documenting of successful rural ITS applications to serve as a resource for decision makers planning future rural deployments. This effort includes an "on-line" ARTS Compendium of some 200 ITS-related projects in rural settings accessible at http://www.its.dot.gov/rural_its.htm. The ITS Joint Program Office manages the rural program under the umbrella of the ITS Travel Management Program discussed in the section on Metropolitan ITS Infrastructure. The Rural ITS page at the URL cited above has a link to the ITS Travel Management Program.

The operational tests and some of the TEA-21 deployment projects described in this section reflect recent initiatives in rural public transportation, integrated weather information and rural travel and tourism. These projects highlight the unique and varied challenges faced by the rural travel environment. A clear example of the need to adapt the deployment of technologies to this environment is exemplified in ITS emergency services. This is a critical application in rural areas where response times are normally greater than in metropolitan areas. This is one of several technology applications requiring further testing and evaluation. Others focused on cellular telephone coverage and road weather information systems are more mature, and better prepared for deployment.

U.S. DOT is pursuing eight program strategies to guide the advancement of ITS across the nation. These strategies are tailored to achieve metropolitan and rural ITS objectives. A very brief summary overview of the strategies supporting the rural ITS program is included here.

Conducting Research – Research efforts will continue along the development tracks. Near-term emphasis will be on field operational tests, and leveraging the deployment projects funded under the ITS Integration Program for lessons learned and benefits information. Activity is concentrated on surface transportation weather and winter mobility, emergency services, and statewide/regional traveler information services.

Accelerating the Development of Standards – U.S. DOT is in the early stages of identifying standards applicable to rural-specific ITS applications. Field operational tests and TEA-21 deployment projects will contribute significantly to the process.

Building Professional Capacity – The Professional Capacity Building (PCB) program provides opportunities for transportation professionals involved in ITS to enhance knowledge, skills and abilities. PCB program resources describe ITS-related practices and techniques successfully applied to rural transportation problems. New courses are regularly added to the PCB curriculum, and existing courses are periodically updated. The PCB program works with the National Highway Institute, the National Transit Institute and other organizations to improve the ITS curriculum and improve accessibility to training, technical assistance and information.

Creating Funding Incentives – TEA-21 provides for funding incentives to be used in ITS integration projects. Deploying organizations are strongly encouraged and guided by an oversight process to structure projects meeting TEA-21 requirements. For rural areas, funding may be expended either for deployment of infrastructure components or the integration of existing systems. This flexibility is in contrast to the requirement that metropolitan ITS projects apply funds for integration only. This latitude recognizes the lower density of deployed rural ITS systems available for integration.

Providing Guidance and Technical Assistance – At this stage of the rural ITS program, guidance and technical assistance are oriented on disseminating the results of research projects and lessons learned from field operational tests.

Ensuring Conformance with the National ITS Architecture and Standards – Interim guidance for ensuring National ITS Architecture and Standards conformance was disseminated in 1999, but has now been superseded by a rule that requires the development of regional ITS architectures. The rulemaking process culminated in January of 2001 with both a Rule (FHWA) and a Policy (FTA) that addresses the TEA-21 requirement that ITS projects funded through the Highway Trust Fund conform to the National ITS Architecture and applicable standards. Regional ITS architectures help guide the integration of ITS components, and ensure that all are compatible with one another and with future ITS projects. In addition, the Rule and Policy require the use of U.S. DOT-adopted ITS standards as appropriate. However, no ITS standards have been adopted by the U.S. DOT to date.

Evaluating the Program – Program evaluation findings on the rural ITS Program are emerging from field operational tests. TEA-21 projects conducted under the ITS Deployment Program are being evaluated through mandatory self-evaluations conducted by resources within their project management teams. A limited number of these projects will be evaluated each year of TEA-21 authorization by evaluation teams contracted by the ITS Joint Program Office (ITS JPO). These JPO-sponsored evaluations are conducted on projects judged to

provide lessons learned and benefits information in areas where the ITS Program has compelling information needs, and has, to date, accumulated only limited data. Evaluation results from these projects will make major contributions to ITS cost and benefits databases.

Showcasing Benefits – Benefits of rural ITS technology applications are being showcased principally in field operational tests and the more mature TEA-21 ITS Integration Program deployments. Areas where emerging insights are being documented include automatic collision notification, traveler information, including applications in a national park setting, and weather systems.

Surface Transportation Weather

FORETELL - INTEGRATING ITS WITH ADVANCED WEATHER PREDICTION

Description:

The project objectives are twofold: (1) to develop an integrated weather information system that improves and broadens the scope of atmospheric and road surface condition information available to highway users and operators; and (2) to assess the benefits of integrating the functions of Road Weather Information Systems, other weather information sources, and transportation management and traveler information operations for a rural section of the transportation system.

As of the fall of 2001, the system was fully operational, and was accessible by all registered users to include winter maintenance managers, commercial vehicle operators, and transit agencies. Data collection was completed by spring 2002, and a final report will be submitted in April 2003.

Project Location: Iowa, Wisconsin, Missouri, Minnesota, Illinois

Partner(s): Iowa DOT, Missouri DOT, Wisconsin DOT

Start Date: October 1997

***End Date*:** April 2003

Estimated Total ITS Funds: $1,760,000

Estimated Total Project Cost: $4,700,000

***Contacts*:**

Paul Pisano	FHWA Headquarters, HOTO	(202) 366-1301
Jim Brachtel	FHWA Iowa Division, HDV-IA	(515) 233-7305

ADVANCED RURAL TRANSPORTATION INFORMATION SYSTEM

Description:

This project is the FY 2000 ITS Integration Program earmark for Grand Forks, North Dakota, funding for which was obligated in mid CY 2001. Project objectives include:

- Deployment of ITS components that support integration of systems outside of metropolitan areas.

- Design and integration of ITS components currently in operation in traveler information systems, and

- Integration of Highway Management Systems with Incident Management, Emergency Management, and Operations and Maintenance Systems.

The project builds on the Advanced Transportation Weather Information System (ATWIS) deployed in the Dakotas. ATWIS is focused on rural settings, and has merged technologies in weather analysis, weather forecasting, telecommunications, and road condition monitoring to produce short term, site-specific forecasts in conjunction with the development of rapid and timely means of dissemination to travelers. Fusion of large quantities of data has spurred the development of a Decision Support System (DSS) designed to manage data to support production and timely dissemination of short-term, site-specific nowcasts/forecasts. The DSS enables evaluation of complex information to support identification of specific travel corridors. In addition to weather prediction models, other weather data to be integrated into forecasting tools include road weather observations providing road surface condition profiles with regard to water and ice coverage. These capabilities are complemented by sub-surface and soil moisture characterization techniques. The project will fuse all data sources to broaden the scope of ATWIS to include Emergency Management, Freeway Management, Operations and Maintenance, and Highway Patrol Systems thus creating a statewide, real-time road condition and incident reporting system.

Project Location: Grand Forks, North Dakota

Partner(s): FHWA, North Dakota DOT, University of North Dakota

Start Date: September 2001

***End Date*:** September 2003

Estimated Total ITS Funds: $393,211

Estimated Total Project Cost: $902,396

***Contacts*:**

Steve Busek	FHWA North Dakota Division, HDA-ND	(701) 250-4348
Leon Osborne, Jr.	U of ND, Regional Weather Information Center	(701) 777-2479

ALPOWA SUMMIT WINTER TRAVEL INFORMATION SYSTEM

Description: This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. This project's objective is to install a dynamic message sign (DMS) on either side of the Alpowa Summit Pass in rural Washington State. This pass is subject to frequent, severe winter weather conditions, and the DMS will provide travelers with road condition and travel restriction information. The signs will be operated by the Central Washington Traffic Management Center in Yakima.

Project Location: US 12 Alpowa Summit Washington

Partner(s): FHWA, Washington State DOT

Start Date: September 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $124,095

Estimated Total Project Cost: $248,190

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Rick Gifford	WSDOT	(509) 577-1985

FY 2001 NEBRASKA CAMERA INTEGRATION WITH DMS, RWIS AND ANTI-ICING INSTALLATIONS

Description: This project is a component of the FY 2001 ITS Integration Program earmark for Nebraska. The project objective is to develop, test and deploy a wireless, Web-based video surveillance system integrated with dynamic message signs (DMS). The integration of video with DMS enables verification of desired DMS operation, and verification of traffic conditions surrounding the DMS. Subsequent to testing and resolution of any issues associated with Internet connection, video installation and integration will be relocated to support integration with a State anti-icing and Road Weather Information System network.

Project Location: Nebraska

Partner(s): FHWA, Nebraska Department of Roads (NDOR), University of Nebraska-Lincoln Peter Kiewit Institute, Nebraska State Patrol

Start Date: December 2001

***End Date*:** September 2003

Estimated Total ITS Funds: $105,000

Estimated Total Project Cost: $210,000

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977
Jim McGee	NDOR	(402) 471-1811

GREATER YELLOWSTONE REGIONAL TRAVELER AND WEATHER INFORMATION SYSTEM

Description:

This project is the FY 2000 ITS Integration Program earmark for Yellowstone Park, MT. The Greater Yellowstone Regional Traveler and Weather Information System project proposes to expand, coordinate and integrate two existing technologies to create a five-state in-vehicle advanced traveler information system. This project will integrate the #SAFE system which provides weather forecasts and road condition reports to in-vehicle devices using wireless communications with the SAFE-PASSAGE pavement temperature model. SAFE-PASSAGE is capable of predicting pavement temperatures thus predicting water freezing, melting and refreezing points.

The #SAFE project was initiated in 1995 to develop and demonstrate the utility of an en-route traveler weather information system in an effort to create safer transportation in the states of North Dakota, South Dakota, and Minnesota. The #SAFE project is currently the nation's only rural operational in-vehicle road/weather condition system. The system was designed to provide travelers with in-vehicle road conditions and weather forecasts for site-specific decision making during a multi-region trip.

This #SAFE system gives weather conditions for traveling roadway. However it does not predict pavement conditions. Beyond visibility, pavement conditions are of utmost importance to the driver. Consequently, the SAFE-PASSAGE computer pavement model is needed. In 1997, the Western Transportation Institute (WTI), in conjunction with the Montana Department of Transportation, began the SAFE-PASSAGE project. This project used ITS technologies to improve the safety of the Bozeman Pass. The Pass is located on Interstate-90 between Bozeman and Livingston, Montana. The geometry of the road and the harsh weather of the area led to a high number of accidents.

As part of this project, researchers at WTI developed a computer pavement temperature model. This model can predict the temperature of the pavement, independent of any in-pavement monitoring sites. Knowing the temperature, it can interpolate when water on the road will freeze, melt, and re-freeze, and at what rate. The resulting information is precise to the lane and mile-marker. This model relies on three programs which independently calculate pavement temperatures based on the three following variables.

1. Temperature: based on a calculated solar and terrain radiation as well as specified initial temperatures and variations in wind velocity, humidity, and cloud cover.

2. Wind: based on initial conditions taken from RWIS and regional wind models.

3. Snow-Ice metamorphism: based on surface temperatures resulting from specified changes in heat flux.

This model was originally designed for DOT maintenance personnel. A computer in the district office alerts maintenance dispatchers of ice ahead of time. It also dictates specifically where anti-icing measures should be employed. This predictive capability leads to increased safety of the road and efficient use of DOT resources.

This integration project proposes bringing these two road-weather information systems together. Each system provides one aspect of what the traveler wants to know. The #SAFE project describes the weather conditions over a section of road. The SAFE-PASSAGE model depicts and forecasts the conditions of the pavement itself. The two systems complement each other, and thus should be integrated to provide more accurate and more complete information for the traveler.

Project Location: Montana, Idaho, Wyoming, Yellowstone National Park, Grand Teton National Park

Partner(s): FHWA, Western Transportation Institute-MT State University; MTDOT; ID Transportation Dept.; WYDOT; University of ND; Swiss Avalanche Institute

Start Date: September 2000

***End Date*:** February 2004

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $2,764,421

Contacts:

Bob Seliskar	FHWA Montana Division, HDA-MT	(406) 449-5302	Ext. 244
Mike Bousliman	Montana DOT	(406) 444-6159	
Steve Albert	Western Transportation Institute-MT State Univ.	(406) 994-6114	

KITTITAS COUNTY WORKZONE TRAFFIC SAFETY SYSTEM

Description:

This project is the FY 2002 ITS Integration Program earmark for Kittitas County, Washington. The project addresses requirements identified in anticipation of a major interstate renovation project coupled with recurring weather impacts. I-90 crossing Snoqualmie Pass in the Cascades Mountains is characterized by three major attributes:

- It is over 30 years old and in need of major reconstruction.

- It is the scene of major, recurring weather effects due to its location at the convergence of warm air flows from Puget Sound and cold Canadian air on the eastern slopes of the Cascades.

- It is the single interstate link between the populous Puget Sound region and Eastern Washington and destination points to the east.

The project will deliver traveler information to the public to mitigate construction and weather-related impacts. Traveler information will be transmitted via a mix of dynamic message signs, highway advisory radio and the Internet. The Web-based component will consist of a flow/volume map combined with visual images. The system will be portable to migrate with construction zones. Remote control will be exercised from the Central Washington Traffic Management Center in Yakima, Washington to ensure timeliness and accuracy.

Project Location: I-90 Kittitas County, Washington

Partner(s): FHWA, Washington State DOT

Start Date: September 2002

***End Date*:** December 2004

Estimated Total ITS Funds: $372,293

Estimated Total Project Cost: $744,586

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Rick Gifford	Washington State DOT	(509) 577-1985

MOUNT ST. HELENS TRAVEL INFORMATION SYSTEMS

Description:

This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The setting in which this project will be developed is the Mount St. Helens National Volcanic Monument. Washington State Route 504 is a 52-mile long highway whose upper 30 miles were reconstructed in the area devastated in the May 1980 volcanic eruption. SR 504 services a high volume of tourist traffic over both the reconstructed portion, and the older section of roadway leading to the monument area. The remoteness of the area, coupled with heavy use result in traveler safety concerns.

The objectives of this project are to:

- Install a series of cameras with weather information at different locations and elevations along the route. These will be connected to the Traffic Management Center in Vancouver via a microwave network.

- Install Highway Advisory Radio (HAR) at the Junction of I-5 and SR 504, and the Junction of I-5 and SR 505. These are the two primary feeder routes to the Volcanic Monument from I-5. These will be located so that they can also provide traffic information about conditions on I-5 if necessary.

- Connect a RWIS site which transmits data via cellular modem, to the new microwave network.

- Install a local microwave network, with the hub at the Signal Peak Radio Site, to connect the cameras and existing RWIS site to the WSDOT network.

- Install a high bandwidth microwave network from Signal Peak to the WSDOT Regional Office in Vancouver. This will provide enough bandwidth to effectively use ITS equipment such as traffic surveillance cameras in remote sites. This will also provide the first part of a network backbone to allow future development of ITS management along the I-5 corridor.

Project Location: SR 504, Cowlitz and Skamania Counties, Washington

Partner(s): FHWA, Washington State DOT

Start Date: September 2002

End Date: November 2003

Estimated Total ITS Funds: $248,190

Estimated Total Project Cost: $496,380

Contacts:

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Chad Hancock	WSDOT	(360) 905-2240

RURAL ADVANCED TRAVELER INFORMATION SYSTEM (RATIS)

Description:

This project builds on previous efforts to develop and demonstrate a Rural Advanced Traveler Information System (RATIS). Initial efforts were implemented as an operational test of an en-route traveler weather information system. This project leverages and extends this project with the objective of expanding the area coverage, augmenting the operational concept and extending the duration of the demonstration.

RATIS is the only system to date that has developed, tested, and produced an operational rural system for travel across vast open spaces, where road conditions and weather information are essential to the economy and personal safety. RATIS capitalizes on the existing wireless telecommunication infrastructure while designing a system that can easily expand and adapt to the rapidly changing telecommunication industry. RATIS has merged technologies from meteorology, computer science, wireless telecommunication, road weather monitoring and forecasting, and transportation into a single decision support system that can respond, adapt, and disseminate information on short notice, with a recurring cycle. RATIS has the ability to quickly adjust to changes in information standards, formats, and protocols as this industry matures.

Much of the technology required to operate this project presently exists within the current operational development and demonstration environment. This includes a decision support system, which combines the technology of weather analysis/forecasting with the computer representations of spatial and attribute information. Ongoing development continues on refining an infrastructure for collecting, processing, and disseminating information in a framework that permits concept validation.

Project Location: North Dakota

Partner(s): FHWA, NDDOT, SDDOT, University of ND, Meridian Environmental Technology Inc., varied cellular telephone companies in ND and SD

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $549,000

Estimated Total Project Cost: $729,000

***Contacts*:**

Steven Busek	FHWA North Dakota Division, HDA-ND	(701) 250-4348
Leon Osborne	University of ND	(701) 777-2479

SCOTTSBLUFF RURAL BRIDGE ANTI-ICING AND WEATHER INFORMATION INTEGRATION

Description: This project is a component of the FY 2001 ITS Integration Program earmark for Nebraska. The project addresses dangerous conditions caused by bridge icing on several bridges in the Scottsbluff area. A priority need is to assess the effectiveness of automated bridge anti-icing systems. This project will deploy bridge anti-icing equipment integrated with a road weather information system and a motorist warning beacon to improve safety and winter storm operations. A fixed anti-icing system will be deployed with variable activation modes (automated, remote, and manual) to facilitate application of surface treatment materials. Assessment of this system will impact statewide deployment planning.

Project Location: Nebraska

Partner(s): FHWA, Nebraska Department of Roads (NDOR), NDOR Districts 4, 5, 6

Start Date: December 2001

***End Date*:** August 2003

Estimated Total ITS Funds: $60,000

Estimated Total Project Cost: $120,000

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977
Jim McGee	NDOR	(402) 471-1811

SPOKANE REGIONAL TRANSPORTATION, CONSTRUCTION, AND WEATHER WEBSITE

Description: This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The project objective is to leverage a regional data warehouse to provide the functionality of a regional Website. Using the Spokane Regional Traffic Management Center as an information and communications hub, this project will network all participating jurisdictions to a regional transportation data warehouse so as to provide travelers with "one stop shopping" capabilities of a regional transportation Website.

Project Location: Spokane, Washington

Partner(s): FHWA, Washington State DOT, Spokane Regional Transportation Council (SRTC), Spokane County, City of Spokane, Spokane Transit Authority (STA)

Start Date: September 2002

***End Date*:** April 2003

Estimated Total ITS Funds: $124,095

Estimated Total Project Cost: $268,190

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Kenneth Knutson	WSDOT	(509) 343-6383

SPOKANE, WASHINGTON STATE ROUTE 395 TRAVELER INFORMATION PROJECT

Description: The objective of this project is to install a roadway information system that will communicate to the public and road maintenance crews information concerning current weather conditions, road surface conditions, border crossings, flooding, slides and any other items necessary to assist roadway users in making informed travel decisions. The system will include ITS technology and be integrated into a regional ITS system. The project plan approach will include: installing video cameras at locations on SR 395, SR 20, SR 21 and SR 25; installing Roadway Weather Information System at key locations on SR 395 or its associated highways; installing highway advisory radios at key locations to provide information to travelers en-route to their destinations; and providing traveler information data and images to the public via an internet web page. Roadway Weather Information Systems will be integrated with traveler information and infrastructure operation and maintenance.

Project Location: Spokane, Washington

Partner(s): FHWA, Washington State DOT, City of Spokane, Spokane Regional Transportation Center

Start Date: September 1999

***End Date*:** September 2003

Estimated Total ITS Funds: $356,161

Estimated Total Project Cost: $712,322

***Contacts*:**

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Kenneth Knutson	WSDOT	(509) 343-6383

STATE OF ILLINOIS; ROADWAY AND WEATHER INFORMATION SYSTEM INTEGRATION

Description:

This is a discretionary project of the FY2000 ITS Deployment Program for the State of Illinois.

GOALS AND OBJECTIVES

The primary goal of this project is to improve safety and mobility. This is accomplished by expanding the deployment of Roadway and Weather Information Systems (RWIS) to three additional sites in rural areas of southern Illinois (Jackson, Johnson, and Alexander counties). These three RWIS locations will provide, for the first time, RWIS data from the southern part of Illinois, and will be a vital part of the entire winter maintenance effort. It will also help in providing advance and more reliable warnings on the weather as it moves into IDOT Division of Highways District 9 and cover areas that are identified 'trouble locations'. All of these sites will have the capabilities to provide advanced snow and ice detection in light of its proximity to the prevailing storm track. Technologies previously developed and used for the 51 existing RWIS locations will be used for the three new sites to ensure system integration and operability.

SCOPE OF WORK

The location for the three new RWIS sites has changed from the August 7, 2000 project description. The new sites are to be constructed at the following locations:

(1) Near the intersection of Illinois Route 3 and the Gorham Spur in Jackson County.

(2) Near mile marker 3.0 on Interstate 24 in Johnson County.

(3) Near the intersection of Illinois Route 146 and Illinois Route 3 in Alexander County.

The project also involves the development of a project architecture to consider the integration of the RWIS data with IDOT traveler information systems including the internet, intranet, potential rest area kiosks, as well as sharing weather and roadway information with other states. Applicable standards for environmental sensors will also be considered in the project architecture development.

Project Location: Various sites in Illinois

Partner(s): FHWA, Illinois DOT

Start Date: September 2001

***End Date*:** June 2004

Estimated Total ITS Funds: $90,000

Estimated Total Project Cost:

$180,000

Contacts:

Wendall Meyer	FHWA Illinois Division, HPP-IL	(217) 492-4634
David Zavattero	Illinois DOT, ITS Program Office	(847) 705-4800
Harold Dameron	Illinois DOT, Bureau of Operations	(217) 782-7228

STATEWIDE ROADWAY WEATHER INFORMATION SYSTEM

Description:

This project is the State of Alaska FY 1999 ITS Integration Program Earmark obligated in FY 2001. This is a phased project whose objective is to deploy a road weather information system (RWIS) with the capability to detect weather conditions to support operational decision-making on a regional basis. Environmental sensor stations (ESS) will be deployed in the Anchorage bowl area. A follow-on phase will expand ESS deployment beyond the Anchorage bowl. The stations will be capable of monitoring and displaying pavement surface, subsurface and atmospheric temperature and conditions. Real-time detection capabilities will include:

- Existing and changing weather conditions.
- Fog, wind speed and direction.
- Roadway surface temperatures/conditions including frost and ice formations.

Data compiled will be transmitted to a central server to support AKDOT operations and maintenance decision-making and traveler information.

Project Location: State of Alaska

Partner(s): FHWA, Alaska DOT and Public Facilities

Start Date: November 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $250,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Al Fletcher	FHWA Alaska Division, HDA-AK	(907) 586-7245
Jeff Ottesen	AKDOT & Public Facilities	(907) 465-6971

STATEWIDE RWIS IMPLEMENTATION AND INTEGRATION PROJECT

Description: This project is a component of the FY 2000 State of Idaho Earmark. The project will install roadway weather information systems (RWIS) at key locations around Idaho. A related objective is to design a plan to integrate Idaho Transportation Department RWIS sites with other weather sites owned by the National Weather Service, the Idaho National Engineering and Environmental Laboratory and with adjoining states' RWIS.

Project Location: State of Idaho

Partner(s): FHWA, Idaho Transportation Department, Montana DOT, Idaho State Police

Start Date: September 2000

***End Date*:** February 2003

Estimated Total ITS Funds: $396,421

Estimated Total Project Cost: $792,842

***Contacts*:**

Ross Blanchard	FHWA Idaho Division, HDA-ID	(208) 334-9180	Ext. 112
Byron Breen	Idaho Transportation Department	(208) 334-8417	

SULLIVAN COUNTY, NEW YORK EMERGENCY WEATHER SYSTEM

Description: This project will fund the installation of a weather station, Highway Advisory Radio and Variable Message Signing to warn drivers of changing conditions of the roadway in time for motorists to react safely. Detours will be established to aid drivers when incidents occur. The 14-mile segment of highway in the project area constructed to 1950's standards, traverses mountainous terrain. High accident rates are experienced where roadway alignment is severe and climatic changes surprise drivers.

Project Location: Sullivan County, New York

Partner(s): FHWA, New York State DOT

Start Date: October 1998

***End Date*:** November 2003

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,250,000

***Contacts*:**

Jerry Zell	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 228
Bill Seaman	New York State DOT	(607) 721-8087	

WASHINGTON STATE ROADWAY WEATHER INFORMATION SYSTEM

Description: This project connects local road and weather information systems around the state into a single Web based application. Centralization of these types of databases allows WSDOT to provide an online statewide road condition report to motorists, thereby reducing the risks associated with variable weather conditions. The project included the installation of RWIS stations and rural CCTV cameras along several major tourist and commercial travel routes. The Washington State DOT will be able to incorporate this road and weather information system into future Maintenance and Traffic Decision Support Systems.

Project Location: Washington State

Partner(s): FHWA, Washington State DOT, University of Washington, Enterprise Pooled Fund Members

Start Date: October 1998

***End Date*:** June 2003

Estimated Total ITS Funds: $1,250,000

Estimated Total Project Cost: $2,759,000

***Contacts*:**

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Larry Senn	Washington State DOT	(206) 543-6741

YAKIMA COUNTY ADVERSE WEATHER OPERATIONS

Description:

This project is the FY 2002 ITS Integration Program earmark for Yakima County, Washington. The project will implement an Adverse Weather Operations Program using a multi-phased approach. Ultimate project objectives include:

- Providing traveler information to area residents and motorists.

- Providing real-time data and condition information for road maintenance, emergency and disaster response.

- Contributing collected data to Washington State's Road Weather Information System.

FY 2002 funding supports Phase I which consists of planning, coordination and installation of 6-to-10 weather reporting stations throughout the county. These stations will include pavement sensors capable of recording temperature, humidity, precipitation, atmospheric conditions, and selected traffic counts. These stations will collect data and streaming video imaging through pavement sensor equipment and remote camera technology. Data and imagery generated will be fed to a wireless communications transmitting system through on-site hard wire. Data will be acquired by receiving stations located along a county fiber optic Trunk Line, and will be transmitted to a Yakima County processing facility for formatting and subsequent distribution to WSDOT, Washington State University and the State's Traveler Information Website.

Project Location: Yakima County, WA

Partner(s): FHWA, WSDOT, Yakima County, Washington State University, University of Washington

Start Date: September 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $392,976

Estimated Total Project Cost: $1,067,976

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Kent McHenry	Yakima County Public Works	(509) 574-2300

Emergency Services

CENTRE COUNTY, PENNSYLVANIA ENHANCED 911 PROGRAM

Description:

This project is the FY 1999 Centre Valley, Pennsylvania Earmark. Funding was obligated in FY 2000. The goal of this project is to implement technologies using geolocation localization methods in an enhanced 911 operation, and to evaluate the benefits of such technologies in improving overall emergency response. The project objectives supporting this goal are to determine the improvement in overall emergency response through time saved and other measures through the use of enhanced 911 emergency calls and determine their usefulness in improving overall emergency response. The motivation for this project is due to the urgency of the Federal Communications Commission mandate that enhanced 911 capability is established beginning in 2001. Cellular location-determining equipment shall be installed at key locations in Centre County, PA, using available commercial cellular towers and Centre County emergency communications towers, in such an arrangement that will provide overlapping coverage for where cellular communication is available. The incoming cellular 911 call will be identified as such and be routed to the public service answering point (PSAP) for Centre County in the municipal building, Bellefonte, PA. The location of the caller is obtained by matching the information from the mobile phone (mobile identification number) with a calculated position estimate that is transmitted to the database accessible over a network by the 911 Communications Center via the automatic location information (ALI) database. The cellular caller location information will be displayed on a combined Computer Aided Dispatch (CAD)/Geographic Information System (GIS) in relation to geographic landmarks and roadways as well as closest or most available emergency service resources. Some of these resources are fixed base sites as well as roving resources such as police cruisers, state patrol cars and ambulances. This system essentially provides a capability equivalent to that rapidly becoming available for 911 calls from fixed locations over landlines. This project will result in the integration of an E911 capability for Centre County, PA.

It is planned that this capability will be left in place indefinitely following the field test and evaluation. A report will document such improvements in emergency response as well as describe a developmental model for such future systems to be reviewed by other agencies as they develop their own plans for such systems.

Project Location: Centre Valley, Pennsylvania

Partner(s): FHWA, NHTSA, Penn DOT, Centre Region Planning Agency, Centre Area Transit Authority, Centre County, Pennsylvania State University, Pennsylvania State Police

Start Date: September 2000

End Date: March 2003

Estimated Total ITS Funds: $395,735

Estimated Total Project Cost: $795,735

Contacts:

Jessie Yung	FHWA Pennsylvania Division, HIT-PA	(717) 221-4422
Matthew Weaver	Penn DOT	(717) 705-1447

WASHINGTON STATE RADIO COMMUNICATION EMERGENCY CALL BOXES

Description: This project will provide emergency call boxes using radio communications technology throughout the State Route 821 Corridor. State Route 821 follows the Yakima River through a canyon with no cellular phone coverage. There are few businesses or residences along the road so there is no place to stop for assistance. When roadway accidents or river rafting accidents occur, there is no timely way to alert emergency service providers. This project will remedy that condition. The Washington DOT will be able to incorporate the emergency call boxes into the Smart Trek Model Deployment Initiative.

Project Location: Washington State

Partner(s): FHWA, Washington State DOT, Kitt Com.

Start Date: October 1998

***End Date*:** September 2003

Estimated Total ITS Funds: $750,000

Estimated Total Project Cost: $1,087,500

***Contacts*:**

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Rick Gifford	Washington State DOT	(509) 577-1985

Statewide/Regional Traveler Information Infrastructure

DEVELOPMENT OF RURAL ITS

Description: The main objectives of this FHWA-sponsored effort specifically include:

* Assisting the U.S. DOT Rural Team in ARTS program management, procurement, development, coordination, and promotion;

* Conducting the comprehensive system engineering efforts necessary for integration of Rural ITS requirements into the National ITS program;

* Conducting specific studies, providing technical assistance, and participating in other activities to define and better understand the technical, institutional, and implementation issues surrounding the development and deployment of Rural ITS; and

* Developing products that document the system design and other Rural ITS findings in a variety of formats that aid in the implementation of this system design by federal, state, and local governments, private industry, and other constituents.

These objectives will be met through a set of task orders; each task order will be issued as needed.

Project Location: Washington, D.C.

Contractor(s): SAIC, Castle Rock Consultants, Multisystems, Inc., Western Transportation Institute

Start Date: October 1998

***End Date*:** September 2003

Estimated Total ITS Funds: $10,706,742

Estimated Total Project Cost: $10,706,742

***Contacts*:**

Michael Freitas	FHWA ITS JPO, HOIT	(202) 366-9292

ACADIA NATIONAL PARK FIELD OPERATIONAL TEST

Description: The Department of Transportation in cooperation with the National Park Service is conducting a field operational test of a real-time traveler information system in and about Acadia National Park. The purpose of the system is to provide accurate information to tourists both pre-trip and enroute.

Project Location: Acadia National Park, Maine

Partner(s): National Park Service, Maine DOT, Friends of Acadia, several local communities

Start Date: November 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $1,274,000

Estimated Total Project Cost: $2,274,000

***Contacts*:**

James Pol	FHWA ITS JPO - HOIT	(207) 366-4374
Susan Moreau	Maine Department of Transportation	(207) 287-2141
Frank Corrado	FHWA Eastern Federal Lands Hwy. Division	(703) 404-6372
Len Bobinchock	Acadia National Park	(207) 288-0374

CAPE COD RURAL ADVANCED INTERMODAL TRANSPORTATION SYSTEM

Description: This project will evaluate the use of Automatic Vehicle Location systems on fixed route, shuttle, paratransit and Council of Aging transit vehicles. A customer information system will be developed with multi-modal information for dissemination through various media designed to greatly enhance the reliability of transit service on the Cape.

Project Location: Cape Code Region, Cape Cod, MA

Partner(s): Bridgewater State College, Bridgewater, MA

Start Date: October 1997

***End Date*:** January 2003

Estimated Total ITS Funds: $200,000

Estimated Total Project Cost: $408,000

***Contacts*:**

William Wiggins	FTA Headquarters, TRI-11	(202) 366-0255
Dennis Walsh	Cape Cod Regional Transit Authority	(508) 385-8311
Larry Harman	Bridgewater State College	(508) 279-6144

GREATER YELLOWSTONE RURAL ITS PROJECT

Description:

One of the key products to be developed as a part of this project is a Strategic Deployment Plan for the Greater Yellowstone Rural ITS Project. This effort addresses the feasibility of applying ITS technologies to solve travel and safety issues in a rural environment. The specific setting of the project encompasses the three major transportation corridors in the surrounding states of Idaho, Wyoming and Montana which travelers use to access the National Park.

The Greater Yellowstone Rural ITS Project will also serve as a testbed for rural ITS applications to facilitate moving the state-of-the art in Advanced Rural Transportation Systems forward. This project will support a limited amount of deployment and testing of the short term projects identified as priorities in the Strategic Deployment Plan. The ability to provide information to travelers has been identified as one of the key needs to be addressed in the initial study. The initial goals identified for the study include increasing safety, improving emergency response, improving commercial vehicle operations, increasing travel information and trip enhancement, improving interagency communications, reducing congestion and increasing economic activity.

Early winner projects identified in the Strategic Deployment Plan include an automatic vehicle identification (AVI) system at Yellowstone National Park entrances. These were installed in the spring of 2002. Dynamic Message Signs have been installed in the Idaho and Wyoming sections of the Park, and one interactive kiosk has been deployed. An Incident Management Plan for roadway closures is currently under development at WTI.

Project Location:

Idaho and Montana; US 191/20 from Bozeman, MT to Idaho Falls, ID; I-15 from Butte, MT to Idaho Falls, ID (including I-90 from Bozeman to Butte); US 89/26 from Livingston, MT to Idaho Falls, ID (including I-90 from Bozeman, MT to Livingston, MT).

Partner(s):

Idaho DOT, Western Transportation Institute, Montana DOT, Wyoming DOT, National Park Service, Idaho National Engineering Laboratory, Idaho State Police, Travel Montana, Gallatin (MT) County

Start Date: June 1997

***End Date*:** March 2003

Estimated Total ITS Funds: $1,500,000

Estimated Total Project Cost: $1,850,000

***Contacts*:**

Bob Seliskar	FHWA Montana Division, HDT-MT	(406) 449-5302	Ext. 244
Ross Tervo	Montana DOT	(406) 444-9237	
Pat McGowen	Western Transportation Institute	(406) 994-6114	

ALASKA TRAVELER INFORMATION SYSTEM INCLUDING VESSEL TRACKING SUBSYSTEM AND HIGHWAY CONDITIONS SUBSYSTEM

Description:

This project is one component of the FY 2001 ITS Integration Program earmark for the State of Alaska. Federal funding for the project was obligated in May 2002. The focus of the project is a new Alaska Traveler Information System (ATIS) with two functional subsystems designed to provide near real-time transportation system information. The Vessel Tracking Subsystem for the Alaska Marine Highway System, and the Highway Conditions Subsystem will provide important and timely data about a diverse and complex intermodal transportation system spanning extreme terrain which is frequently subjected to adverse weather conditions.

The Vessel Tracking Subsystem will provide near real-time position reporting for the vessels in the Alaska Marine Highway System (AMHS). The system will also provide for limited e-mail communications between AMHS shore-based staff and all deployed vessels. The system will also transmit data from shipboard weather stations to the National Weather Service.

The Highway Conditions Subsystem will provide real-time reporting of highway conditions, road closures, and maintenance/construction activity. These subsystems will feed an ATIS depicting road conditions, roadway weather and ferry information generated into maps accessible on the Internet.

Project Location: State of Alaska

Partner(s): FHWA, Alaska Department of Transportation and Public Facilities (ADOT&PF)

Start Date: May 2002

***End Date*:** October 2004

Estimated Total ITS Funds: $477,819

Estimated Total Project Cost: $955,638

***Contacts*:**

Al Fletcher	FHWA Alaska Division, HDA-AK	(907) 586-7245
Jeff Ottesen	ADOT&PF	(907) 465-6971

BRANDON, VERMONT

Description:

Brandon is located in western Vermont along the US Route 7 corridor. Route 7 is part of the National Highway System (NHS) and is the main north-south travel corridor in western Vermont, connecting western Massachusetts to the south with Quebec to the north. It passes through Bennington, Rutland, and Middlebury, three of the largest communities in the state, as well as the Burlington metropolitan area, which is the major population center.

This corridor has significant amounts of truck traffic, as it is the principal connection for freight transportation between the major communities and the Albany, New York, area. In many areas, limited passing opportunities create long queues of vehicles behind slow-moving trucks. Since the right-of-way for Route 7 dates back to the very earliest days of county road building in the state, it passes directly through most of the town and village centers along the corridor, including Brandon. This condition is aggravated by heavy truck traffic through town transporting ore from a quarry to a processing plant on northern and southern sides of town. This project will pursue the following initiatives designed to address Brandon's problems:

--Brandon Route 7 WIM site. Adding a WIM site to the state WIM system will allow Vermont to gather considerable data regarding traffic flows, types, and weights. This in turn will help in further defining the existing problem and developing appropriate ITS solutions.

-- Regional ATIS. The Rutland Regional Commission will implement a simple Web page with traveller information for the region which includes Brandon. This Web site will enhance intermodal connectivity by providing information regarding schedules and availability of air, rail, and transit services, as well as roadway construction. The Rutland area is served by scheduled air service, Amtrak, and several local transit operators, but there is no central source for information regarding the different modes.

Deployment activity was completed in October 2001. Final report closing out the project is anticipated by April 30, 2003.

Project Location:

Brandon, Vermont

Partner(s):

Vermont Agency of Transportation; Brandon, VT Selectboard; Rutland Regional Planning Commission; Vermont Division of Travel and Tourism

Start Date:

September 1999

End Date:

April 2003

Estimated Total ITS Funds:

$296,801

Estimated Total Project Cost:

$593,602

Contacts:

Jim Bush	FHWA Vermont Division, HTD-VT	(802) 828-4423
Bruce Bender	Vermont Agency of Transportation	(802) 828-3984

CALHOUN COUNTY I-69 AND I-94 INTERCHANGE SIGNING PROJECT

Description: This project is the FY 2001 ITS Integration Program earmark for Calhoun County, Michigan. Project funding was approved in September 2002. The project is ultimately designed to provide traveler information to users of rural segments of highways I-69 and I-94 which support heavy volumes of traffic with destinations in Toronto, Montreal and Atlantic Ocean harbors. When implemented, this project's traveler information system will provide drivers information about existing and potential delays at the Detroit/Windsor and Port Huron/Sarnia crossing points. The system will process urban traffic status information and communicate it to drivers in a rural area. Thus, this project would link metropolitan and rural areas through the application of ITS technology which facilitates route selections designed to minimize travel time delay. Phase I of this project is a study to determine infrastructure components to be deployed. Infrastructure deployment is planned for Phase 2 in CY 2003.

Project Location: Calhoun County, Michigan

Partner(s): FHWA, Michigan DOT, Calhoun County Community Development

Start Date: September 2002

***End Date*:** December 2005

Estimated Total ITS Funds: $595,211

Estimated Total Project Cost: $1,190,422

***Contacts*:**

Morrie Hoevel	FHWA Michigan Division, HDA-MI	(517) 702-1834
Dennis Randolph	Calhoun County Community Development	(616) 781-9841

CARS/FORETELL ENHANCEMENTS AND DEPLOYMENT FOR ATIS

Description: This project is the FY 2001 ITS Integration Program earmark for the State of New Mexico. Project funding was approved in September 2002. The project will integrate existing road condition information into a common database, and establish an advanced Traveler Information System (ATIS) Website for the dissemination of highway/road closure and restriction data statewide and in the Metropolitan Albuquerque area. The project will also integrate National Weather Service data. The Condition Acquisition and Reporting System (CARS) Pooled Fund Program established under the FHWA Report Pooled Fund will be the centerpiece of the system. The project's concept is to convert CARS to a true XML application to facilitate parsing of data among systems (telephony, Website, Dispatch and E-mail). A related objective is to integrate CARS/FORETELL with National Weather Service Data to automate weather-related inputs to county watches and warnings into CARS. A final objective is to integrate National Weather Service data with road condition modeling available through the CARS/FORETELL platform to facilitate statewide road weather condition monitoring and forecasting.

Project Location: New Mexico

Partner(s): FHWA; New Mexico State Highway and Transportation Department (NMSHTD); City of Albuquerque; Bernalillo County; City of Rio Rancho

Start Date: September 2002

***End Date*:** March 2004

Estimated Total ITS Funds: $297,605

Estimated Total Project Cost: $717,605

***Contacts*:**

Joe Maestas	FHWA New Mexico Division, HDA-NM	(505) 820-2026
Terrence Doyle	NMSHTD	(505) 841-4891

CUMBERLAND GAP TUNNEL AND REGIONAL DEPLOYMENT (MIDDLESBORO, KENTUCKY)

Description:

The ITS project for the Cumberland Gap Tunnel and surrounding regional area will deploy and integrate additional ITS technologies and systems to enhance the safety, mobility, and operations of the regional transportation system. The Cumberland Gap Tunnel is a critical link along the US 25E corridor which intersects with I-75 near Corbin, Kentucky and I-81 near Morristown, Tennessee. It has already benefited from several ITS applications begun in 1998. The 1998 deployment project began installation of an Advanced Traveler Information System to reroute traffic, especially truck traffic, around the Cumberland Gap tunnel during events denying tunnel access. The tunnel is located in a remote, mountainous part of the state accessible only by a single highway with no parallel routes.

The first step in this project is to develop a regional architecture. A long-term goal for the regional area will be to develop an infrastructure which has the capability to accommodate both temporary and permanent traffic management and traveler information systems.

Among the ITS applications proposed for the corridor are closed circuit television cameras, variable message signs, highway advisory radio, and road weather information systems. The project will provide an appropriate level of integration of system components to ensure operational efficiency and effectiveness.

Federal funding listed below includes 1998 funding and FY 99 earmarked funds. Total funding also includes matching funds allocated in both years.

Project initiation was delayed pending development of a regional architecture.

Project Location: Middlesboro, Kentucky

Partner(s): Kentucky Transportation Cabinet, Tennessee DOT, National Park Service, Kentucky Tourism Cabinet, Tennessee Tourism Department, Tunnel Management Inc.

Start Date: June 2001

***End Date*:** June 2003

Estimated Total ITS Funds: $3,924,409

Estimated Total Project Cost: $6,780,000

***Contacts*:**

Glenn Jilek	FHWA Kentucky Division, HDA-KY	(502) 223-6727
Charles Knowles	Kentucky Transportation Cabinet	(502) 564-4556

EMERGENCY ADVISORY RADIO COORDINATION

Description:

This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The project objective is to enhance the capabilities of Washington State DOT's system of highway advisory radio (HAR) sites. HAR sites transmit highway construction impact and mountain pass information. The system rarely provides traffic incident impacts, and does not support civil emergency/natural disaster requirements. The primary constraint precluding optimal use of HAR is the time and effort to perform individual updates from a single location - usually a traffic management center. Both technical and institutional issues must be resolved in order to coordinate and concatenate messages from multiple locations at a single HAR site.

The goals of this project include improving the timeliness and types of information disseminated through HAR systems in order to maximize the availability of travel choices and emergency information to the traveling public. The improvements will also allow the archiving of HAR messages, the posting of messages on the Internet, and enable the ability to interact with other systems.

To achieve these goals, this project proposes using a networked server system to update HAR messages. Once a message is composed, the process of sending it to a site, or multiple sites, can be automated. This will greatly reduce the time required to update HAR messages, and enable its use to provide information to the traveling public for much shorter term events, including incidents and congestions alerts.

Project Location: Washington State

Partner(s): FHWA, Washington State DOT, Washington State DOT Emergency Management Center, County EOCs

Start Date: September 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $289,555

Estimated Total Project Cost: $789,660

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Bill Legg	WSDOT	(206) 543-3332

FRANKLIN COUNTY, MASSACHUSETTS TRAVEL INFORMATION SYSTEM

Description: This project will develop a Traveler Information Service for the Route 2 Corridor of Central and Western Massachusetts. The purpose of the project is to provide the tourist, en route traveler, and commercial vehicle operator with relevant information on local attractions and services in the project area, combined with relevant information on traffic and weather conditions on Route 2 and I-91. The two principal goals of the project are to increase tourism and enhance motorist safety through the provision of traveler information.

Project Location: Franklin County, MA

Partner(s): Franklin County Chamber of Commerce, Franklin County Regional Council of Governments

Start Date: September 1998

***End Date*:** June 2004

Estimated Total ITS Funds: $875,000

Estimated Total Project Cost: $1,093,750

***Contacts*:**

Edward Silva	FHWA Massachusetts, Division, HDA-MA	(617) 494-2253

FY 2001 STATE OF NEBRASKA 511 TRAVELER INFORMATION, PHASE II

Description: This project is a component of the FY 2001 ITS Integration Program earmark for the State of Nebraska. The project objective is to integrate traveler information services to provide route specific weather forecasts and road condition reports through multiple communications media to include: wireless, the Internet, land line telephones, and dynamic message signs. Projected benefits include enhanced safety and improved efficiency. The system's vision is to utilize weather forecasting and analysis, road condition monitoring, and effective report generation to provide short-term route specific forecasts for travelers across the state. It is anticipated that Nebraska's 511 system will accommodate rapid adaptation to new wireless technologies supporting expanded services such as lodging and tourist information.

Project Location: Nebraska

Partner(s): FHWA, Nebraska Department of Roads (NDOR), Nebraska State Patrol

Start Date: October 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $50,000

Estimated Total Project Cost: $100,000

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977
Jim McGee	NDOR	(402) 471-1811

I-90/I-94 RURAL WISCONSIN ITS CORRIDOR

Description: The Wisconsin Department of Transportation (WisDOT) developed a strategic deployment plan for the Interstate 90/94 corridor in order to implement Intelligent Transportation Systems (ITS) technologies to improve the mobility, efficiency, productivity, and safety of travelers within the corridor. The corridor plan focuses on using ITS technologies in a rural environment and addresses unique rural problems and needs. This funding will enable ITS technology deployment and planning for the "West Salem" Weigh-in-Motion Scale, Automated Oversize/Overweight Routing, Variable Message Sign/Changeable Message Sign Operational Testing, and Incident Management.

Project Location: Interstate 90/94 Corridor, Wisconsin

Partner(s): FHWA, Wisconsin DOT

Start Date: October 1998

***End Date*:** June 2003

Estimated Total ITS Funds: $1,700,000

Estimated Total Project Cost: $1,700,000

***Contacts*:**

John Berg	FHWA Wisconsin Division, HDA-WI	(608) 829-7515
Philip DeCabooter	Wisconsin State DOT	(608) 267-0452

LEWIS AND CLARK INTELLIGENT KIOSK PROJECT

Description:

This project is the FY 2001 ITS Integration Program earmark for the segment of the Lewis and Clark National Historical Trail in Montana. The project addresses the challenge of delivering accurate and up-to-date transportation and traveler information along the Lewis and Clark Trail. Project planners are concentrating on Internet dissemination systems, touch-screen kiosks and the delivery of content to hand-held devices.

This initial research and development project is intended to be the first phase of a five year concept designed to identify, develop and integrate existing ITS with other resources such as NOAA Weather information to disseminate transportation and traveler information to visitors along the Trail. The first year project will focus geographically on the portion of the Lewis and Clark trail in Montana.

The goal of Phase One is to identify the relevant technologies that will be necessary to build a "Trail wide" information delivery system that integrates a number of existing and evolving ITS systems with content that could assist travel planning and rural economic development through increased tourism activity. During the first phase, the project will explore a number of new technologies and delivery systems which aggregate traveler information from six different sources and distribute it to travelers via touch screen kiosks, hand held devices, Web sites and as public service announcements on local cable stations. The completion of the first phase will end in the installation and implementation of four state-of-the-art kiosk systems in Lewis & Clark (L&C) pilot sites in Montana. As additional funds become available the intention is to extend the concepts proven here first on a regional basis and finally along the entire Trail.

Project Location: Montana

Partner(s): FHWA, Montana DOT, Information Technology Resource Center- University of Montana, Western Transportation Institute-Montana State University, VIAs, Montana Lewis and Clark Bicentennial Commission, Polar Bear Productions, NCR, ESRI

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $496,009

Estimated Total Project Cost: $994,734

***Contacts*:**

Bob Seliskar	FHWA Montana Division, HDA-MT	(406) 449-5302	Ext. 244
Ross Tervo	Montana DOT	(406) 444-9248	
Lynn Churchill	Univ. of MT - Information Technology Resource Ctr.	(406) 243-5350	

MAINE STATEWIDE DEPLOYMENT AND INTEGRATION OF DYNAMIC MESSAGE SIGNS

Description: This project is the FY 2002 ITS Integration Program earmark for Maine. This project will deploy and integrate numerous dynamic message signs (DMS) across state and other jurisdictional boundaries. The project is a component of a Tri-State (Maine, New Hampshire, and Vermont) effort to provide travelers and tourists with accurate, real-time information about road conditions, lodging and recreational activities. Information feeding the DMS will be the Condition Acquisition Reporting System (CARS) and FORETELL - a Road and Weather Predicting System. CARS and FORETELL will provide a combination of core information on road and traffic conditions and a predictive component to road condition reporting.

Project Location: Maine

Partner(s): FHWA, Maine DOT, Maine Office of Tourism, Maine Turnpike Authority, New Hampshire DOT, New Hampshire Dept. of Resources & Economic Development, Vermont Agency of Transportation, Vermont Dept. of Tourism & Marketing, I-95 Corridor Coalition

Start Date: January 2003

***End Date*:** August 2005

Estimated Total ITS Funds: $413,659

Estimated Total Project Cost: $827,318

***Contacts*:**

John Perry	FHWA Maine Division, HPR-ME	(207) 622-8350	Ext. 103
Russell Charette	Maine DOT	(207) 624-3238	

MONROE COUNTY, NEW YORK INTEGRATION PROJECT

Description: This project will develop and construct the Airport/Transportation Operations Center (A/TOC) in support of objectives identified in the regional strategic plan, known as the Improved Mobility Areawide Guidance Evaluation (IMAGE). The project, initiated with FY 1999 earmarked funding, has been expanded to accommodate FY 2000 earmarked appropriations. The A/TOC will enable the integration of transportation operations, to include freeway management, arterial management as well as enforcement activities, and will serve as the centerpiece of the Rochester Advanced Transportation Management System. NY State DOT, Monroe County DOT, the NY State Police and the Greater Rochester International Airport have agreed on a shared facility. Additional integrations will be accommodated as determined through the updating of the existing regional ITS architecture.

Project Location: Monroe County, New York

Partner(s): FHWA, Monroe County DOT; Monroe County Department of Public Safety; New York State Police; Rochester-Genesee Regional Transportation Authority; New York State DOT

Start Date: September 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $1,103,008

Estimated Total Project Cost: $10,750,000

***Contacts*:**

Jerry Zell	FHWA New York Division, HTS-NY	(518) 431-4125	Ext. 228
Jim Willer	NYSDOT, Region 4	(716) 272-3450	

NEBRASKA 511 SYSTEM

Description:

This project is a component of the FY 2000 ITS Integration Program State of Nebraska earmark. The project objective is to implement an advanced traveler information system (ATIS) which integrates various existing sources of traveler information into one, easily accessible system. The system will incorporate locally derived weather information, as well as road closure and incident information. The system design will accommodate expansion to include additional elements such as tourist information and lodging availability.

The ATIS will emphasize route specific weather forecasts and road condition reports directly accessible by travelers. Nebraska plans to utilize the Meridian Environmental Technology model, which supports the #SAFE service, to deploy 511 service in the state.

Project Location: Nebraska

Partner(s): FHWA, Nebraska Dept. of Roads, Nebraska State Patrol

Start Date: May 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $62,152

Estimated Total Project Cost: $80,000

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977

PORT ANGELES, WASHINGTON

Description: This project will install a comprehensive traveler information system along the Washington State Route 101 corridor on the northern Olympic Peninsula. The system will be comprised of several technology components, each of which has been proved in other locations in the State. The overall value of the project will be realized through integration of these components into a sum providing more value than the sum of its parts. This project will become a natural extension of the Smart Trek traveler information effort underway in the greater Seattle and Tacoma areas. Key components include video imagery, highway advisory radio sites, and a roadway weather information system.

Project Location: Port Angeles, Washington

Partner(s): Washington State DOT, City of Port Angeles, North Olympic Peninsula Visitors and Convention Bureau, Olympic National Park, Greater Victoria Visitors and Convention Bureau

Start Date: September 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $395,735

Estimated Total Project Cost: $500,000

***Contacts*:**

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
John Nisbet	Washington State DOT	(360) 357-2670

ROADSIDE ANIMAL DETECTION SYSTEMS

Description:

This project is the FY 2002 ITS Integration Program earmark for Montana. The project will create the Roadside Animal Detection Systems Test-bed (RADS Test-bed). This system will: (1) provide accurate monitoring of animal presence through infrared cameras; (2) permit several animal detection vendors to contribute their systems into the test-bed; and (3) ultimately facilitate deployment of dynamic warning signs that will be activated when animals are detected on the roadside. Project objectives envision successful deployment of an animal detection/driver warning system, and provide baseline data on the accuracy/effectiveness of various detection systems.

The precursor to this project is an ongoing effort called the Animal Vehicle Crash Mitigation Using Advanced Technologies Pooled Fund Study. Initiated in January 2000 under the sponsorship of the Western Transportation Institute (WTI) and the Oregon Department of Transportation, the initiative seeks to quantify the effectiveness of potential solutions for animal-crash mitigation employing advanced technologies. The pooled fund study's goal is to demonstrate and evaluate animal detection systems that alert motorists with dynamic signing. This effort will deploy two roadside demonstration sites in Montana. Before the RADS test-bed effort is launched, an assessment of these two animal detection and sign activation sites on driver behavior will be completed. With this background, the purpose of the RADS Test-bed is to equip a typical roadside environment known to have high levels of animal movement with cameras, control modules and data collection equipment. Vendors with animal detection systems will be invited to set up their equipment on this test-bed for evaluation by WTI. WTI will synthesize results into a report for each detection technology to include development of a cost-benefit analysis for each system. This information will be provided to transportation professionals to support decision making for investments to protect drivers and animals against animal vehicle crashes.

Project Location: I-15 Montana

Partner(s): FHWA, Montana DOT, Western Transportation Institute-Montana State University, Humane Society, AAA Foundation

Start Date: September 2002

***End Date*:** February 2009

Estimated Total ITS Funds: $415,659

Estimated Total Project Cost: $827,318

***Contacts*:**

Bob Seliskar	FHWA Montana Division, HDA-MT	(406) 449-5302	Ext. 244
Ross Tervo	Montana DOT	(406) 444-9248	

RURAL DEPLOYMENT OF HIGHWAY ADVISORY RADIO

Description: This project is the FY 2001 ITS Integration Program earmark for San Antonio, TX. TransGuide is the ITS for the San Antonio metropolitan area. It has provided real-time traffic information to transportation officials, emergency services, transit operators and the local media since 1995. TransGuide information is available to the public through the Internet. Heavy truck traffic along I-35 between San Antonio, Texas and Laredo, Texas has increased dramatically with the passage and implementation of the North American Free Trade Agreement. I-35 is the only interstate highway approaching Laredo, the busiest land port in the nation. The implementation of a Highway Advisory Radio (HAR) system in rural areas approaching the San Antonio metropolitan area will allow the increasingly heavy truck and other commercial traffic to take advantage of available real-time traffic information. The use of the real-time traffic information by commercial vehicle operators will reduce time delays for the operators, and will help alleviate congestion in the metropolitan area. San Antonio currently has real-time traffic available for approximately 150 miles of freeways and major arterials, however this information is primarily available through the Internet, or through local television or radio traffic information. Traffic information broadcast by the media is intended primarily for local commuters, and is not geared to through traffic of heavy trucks. Implementation of a HAR program could alert truck drivers to major incidents in the San Antonio area while drivers are still in a rural area and have the opportunity to select alternate routes.

Project Location: San Antonio, Texas

Partner(s): FHWA, Texas DOT, ITS Steering Committee

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $79,361

Estimated Total Project Cost: $175,361

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Brian Fariello	Texas DOT	(210) 731-5247

RURAL NEBRASKA INTEGRATED DYNAMIC MESSAGE SIGN ELEMENT

Description:

This project is a component of the FY 2001 ITS Integration program earmark for Nebraska. Project objectives include:

- Installation, operation and maintenance of 4 to 6 dynamic message signs (DMS) to enhance traveler safety and transportation system efficiency.
- Integration of the DMS with the associated District Office and the State Joint Operations Center.
- Integration of existing portable DMS Sign Operations into the control system for Permanent Rural DMS Sign Installations.

Achieving these objectives will significantly contribute to delivery of effective traveler information along the I-80 corridor across Nebraska. This corridor, occasionally prone to unplanned road closures has severely stressed facilities in towns bordering the interstate. The need for rapid provision of traveler information on road closures at distances allowing sufficient reaction time for route diversion is a high priority not only for the portion of I-80 in Nebraska, but also for adjacent stretches in Wyoming and Colorado.

Project Location: I-80 Corridor, Nebraska

Partner(s): FHWA, Nebraska Department of Roads (NDOR), Nebraska Districts 4, 5, and 6

Start Date: February 2002

***End Date*:** February 2004

Estimated Total ITS Funds: $895,000

Estimated Total Project Cost: $1,790,000

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977
Jim McGee	NDOR	(402) 471-1811

SOUTH PUGET SOUND OPERATIONAL IMPROVEMENTS

Description: This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The setting for this project is I-5 in Thurston County, Washington. The area has experienced significant population growth in recent years. The combination of congestion and winter icing has heightened citizen concern over increased crash rates. This project will establish the basis for improved incident management and emergency management along the I-5 corridor in Thurston County. The initial phase of the project will install an ice warning system in I-5. This system will be comprised of a Road Weather Information System and Highway Advisory Radio. A follow-on phase will deploy three closed circuit TV devices with a digital microwave link to enable integration with the Regional WSDOT Traffic Management Center. The final phase of this project will deploy a Dynamic Message Sign that will inform motorists of traffic condition data collected with ITS elements deployed in phases I and II.

Project Location: Thurston County, Washington

Partner(s): FHWA, Washington State DOT, Washington State Patrol, Thurston County Planning Council, Thurston County Fire Dept., MIXX 96FM

Start Date: September 2002

***End Date*:** October 2003

Estimated Total ITS Funds: $206,825

Estimated Total Project Cost: $413,650

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
John Nisbet	WSDOT	(360) 357-2670

STATE OF IDAHO ITS INTEGRATION

Description:

This FY 1999 ITS Integration Program project seeks to implement Stage 2 of a Regional (Treasure Valley) ITS Plan with the following objectives:

- Development of a design for a real-time data collection, integration, and communications system that includes sensors strategically placed on the Treasure Valley freeway and arterial systems.
- Development of a decision support system and database that integrates real-time traffic data.
- Development of a virtual traffic management center to be used to monitor traffic flow in Treasure Valley and that can be used to train new engineers and technicians who will operate 21st century transportation systems.

Project Location: Treasure Valley, Idaho

Partner(s): Idaho DOT, Ada County Highway District, Ada Planning Association, University of Idaho, Boise State University

Start Date: September 1999

***End Date*:** October 2003

Estimated Total ITS Funds: $441,000

Estimated Total Project Cost: $837,204

***Contacts*:**

Ross Blanchard	FHWA Idaho Division, HDA-ID	(208) 334-9180	Ext. 112
Jim Larsen	Idaho DOT	(208) 387-6196	

STATE OF WASHINGTON ITS DEPLOYMENT AND INTEGRATION

Description:

The Washington State FY 99 ITS Integration effort is comprised of three projects: Ferry Terminal Traveler Information Improvements; State Routes 2 & 97 Traveler Information Project; and Columbia Gorge Traveler Information System Pilot Program, described separately below.

- Ferry Terminal Traveler Information Improvements (ITS Funding-$548K). Washington State Ferries (WSF), as part of the Washington State Department of Transportation (WSDOT), operates the largest ferry system within the United States. The ferry system serves 10 routes within Puget Sound, which connect the Olympic Peninsula to the I-5 corridor as well as providing vital links to the San Juan and many other islands within the Puget Sound. The objective of this project is to install comprehensive traveler information systems that will inform ferry system users about delays and congestion on ferry routes. Infrastructure to be installed includes: CCTV; vehicle detectors; traveler information dissemination via web page; highway advisory radio and Variable Message Signs (VMS) controlled from WSDOT's Seattle Travel Management Center (TMC). Total Cost-$1,236K

- The State Routes 2 & 97 Traveler Information Project (ITS Funding-$275K). Seeks to enhance the traveler information system along State Routes 2 & 97 in Chelan County. To be accomplished by installation of a roadway information system to communicate weather, road surface condition and road closure information to the public and maintenance crews. Components to be deployed include: CMS, HAR; Roadway Weather Information System (RWIS); web page linked to WSDOT home page; completion of a communication and power link from Stevens Pass to Blewett Pass. Total Cost-$555K

- Columbia Gorge Traveler Information System Pilot Program (ITS Funding-$150K). This project, initiated in December 2000, is substituted for FY 1999 ITS Integration Program earmarked project titled "I-5 Corridor Multimodal Traveler Information System Design and Pilot Implementation" which was cancelled by Washington State DOT on December 6, 2000. The objective of this project is to install a roadway information system which will communicate to the public and road maintenance crews information concerning current weather conditions, road surface conditions, flooding, slides, and other data elements needed to support users in making informed travel decisions. The system will incorporate ITS technologies, and will be integrated into the regional ITS system. Major components include: CCTV, a road weather information system site, an Internet web page linked to OR DOT's web page, highway advisory radio installed at key locations, and variable message signs. Total Cost-$330K

Project Location: State of Washington

Partner(s): Washington State DOT; Chelan County; Washington State Ferries

Start Date: September 1999

End Date: March 2003

Estimated Total ITS Funds: $973,000

Estimated Total Project Cost:

$2,121,000

Contacts:

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Pete Briglia	Washington State DOT	(206) 543-3331
Vinh Dang	WSDOT	(206) 440-4462
Chad Hancock	WSDOT	(360) 905-2240

STATE OF WISCONSIN ITS INTEGRATION

Description:

This activity seeks to develop a Statewide programmatic project development and budgeting approach over six years for Wisconsin ITS projects.

The State shall work to accomplish the following goals and objectives (where goals represent high-level descriptions of what the project will accomplish and objectives define specific actions that can be used as metrics for determining progress towards the goals).

Wisconsin proposes to accomplish deployment planning and begin implementation of rural incident, traffic management and traveler information systems along expanded parts of the rural Interstate corridors and major arterial networks in the State. This effort will concentrate on funding projects in the 1999, 2000 and 2001 State fiscal years.

The agreement will outline the State's commitment relating to the following projects and their integration into an overall Statewide system.

- High speed weigh-in-motion
- Statewide traveler information deployment
- Statewide ITS architecture
- Portable changeable message signs
- Interconnected signal systems for medium sized cities adjacent to interstate corridors

Project Location: State of Wisconsin

Partner(s): Wisconsin DOT, Wisconsin State Highway Patrol, Department of Motor Vehicles

Start Date: September 1999

***End Date*:** October 2003

Estimated Total ITS Funds: $837,204

Estimated Total Project Cost: $1,674,408

***Contacts*:**

John Berg	FHWA Wisconsin Division, HDA-WI	(608) 829-7515
Philip DeCabooter	State of Wisconsin DOT	(608) 267-0452

TRAVELER INFORMATION SYSTEM EXPANSION

Description:

This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. This project will expand and enhance existing Traveler Information Services in the greater Seattle, WA area. Existing Traveler Information infrastructure includes an extensive network of cameras and vehicle detection loops which continually collect and processes traffic data into information. This information is disseminated to users via dynamic message signs (DMS) and highway advisory radio (HAR), multiple phone lines, and the Internet. Increased volume has placed this system under heavy load.

The Traveler Information System Expansion project will deploy additional DMS and HAR at locations without coverage, and at major interchanges. Integration with TMCs and local agencies in the greater Puget Sound area will further expand desired capabilities such as posting HOV travel times on DMS and additional camera coverage to support the area's Web Traffic Flow map.

Project Location: Puget Sound Area, Washington

Partner(s): FHWA, Washington State DOT, King County, City of Seattle

Start Date: September 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $579,110

Estimated Total Project Cost: $1,158,220

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Vinh Dang	WSDOT	(206) 440-4462

US 195 RURAL TRAVELER INFORMATION SYSTEM

Description: This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The project expands coverage provided by a FY 2001 ITS Integration Program earmarked project (Spokane County, Washington) which initiated deployment of traveler information services in the region. This project will use the Spokane Regional Traffic Management Center as a communication hub to which additional software modules will be added for regional control of Highway Advisory Radio, data stations and center-to-center communications. This project will also establish the basis for Web-based traveler information complemented by a traffic, weather, and construction Web site.

Project Location: Spokane County, Washington

Partner(s): FHWA, Washington State DOT, Spokane Regional Transportation Council (SRTC), Spokane County, City of Spokane

Start Date: September 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $206,825

Estimated Total Project Cost: $413,650

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Kenneth Knutson	WSDOT	(509) 343-6383

VERMONT TECHNOLOGICAL ALLIANCE PROJECT: VERMONT RURAL ADVANCED TRAVELER INFORMATION SYSTEM (TRAV 2000)

Description:

This is a multi-year project which originated as the FY 2000 State of Vermont earmark. The project will develop and link database systems which will provide travelers and tourists in Vermont with accurate and real-time information about road conditions, way-finding, and destination information. This project fills the need for advanced traveler information to support the needs of an increasing number of travelers visiting the State. Through the development and linkage of a comprehensive database and the application of technology, travelers will be better able to make informed decisions before and during their trips using the Internet (home based, mobile lap-top or palm held), on-board digital appliances, signs, and a network of kiosks. The elements will consist of a technical infrastructure, a coordinated and sustainable relational traveler information database, a high quality visitor information center presentation at key sites, a web-based traveler information application linked to appropriate non-profit and regional travel information sites, a reservation booking system, and a teleservicing information and way-finding service. Once successfully implemented, the system will provide a basis for further efforts of Vermont, New Hampshire, and Maine to develop a Tri-State Rural Advanced Traveler Information System (RATIS). Vermont's advance work in this area holds the promise of providing a pilot for the tri-state project and it is Vermont's intention that any RATIS work product shall be made available to its tri-state neighbors for the benefit of the entire tri-state region. The first year of the project concentrated on data development, system design, and component procurement.

The FY 2001 ITS Integration Program earmark for Vermont is allocated to Phase II of this project. The core goals of Phase II of this project to be pursued by the FY 2001 earmark, are to ensure the system under development is complete, dynamic and sustainable. Additional elements include developing and documenting standards for integration with intra-state and interstate partners as well as future private sector applications. Phase II (FY 2001) highlights include:

- Statewide Database and Web Development
- Regional Application Standards and Policies Pilot
- Design and Integration of Mapping Applications
- Information System Integration with Tri-State Planning
- Web Site Presentation Integration
- Application Enhancement

Phase III (FY 2002)

The FY 2002 ITS Integration Program Vermont Statewide earmark provided an additional $1,240,977 to this project. This funding level was matched from non-federal sources with a like amount. These funds are allocated to Phase III of this project which focuses on the following activities:

- Electronic Touch-Screen Kiosks

  --Expanding the content of kiosks to integrate road conditions, traffic/construction updates, and weather information.

  --Conducting usability testing to assess customer response to kiosks.

  --Developing an approach for connecting kiosks to the Internet, and implementing most cost-effective approach.

- En-Route Traveler Information (formerly "Wayfinding")

  --Developing a feasible approach for delivering information from the ConnectVermont database to travelers en-route.

  --Enhance information content to support en-route traveler needs, and integration 511 service.

- Content/Application Management

  --Web site presentation and integration improvements.

- Software, Database, Program and Standards Development

  --Program management functions.

  --Exploring applicable standards.

  --Ensuring consistency with ITS Standards and the National ITS Architecture.

- Outreach/Training

- Sustainability and Data Population

- TRIO (Tri-State Integration)

  --Integrating Vermont systems into the TRIO Project undertaken jointly with New Hampshire and Maine.

Funding amounts depicted under "Estimated Total ITS Funds" reflect funding for FY 2000 through 2002.

Project Location: State of Vermont

Partner(s): FHWA, Vermont Agency of Transportation, Vermont Agency of Commerce-Department of Tourism and Marketing, Vermont Department of Buildings and General Services, Vermont Travel Information Council

Start Date: September 2000

***End Date*:** December 2004

Estimated Total ITS Funds: $3,217,820

Estimated Total Project Cost: $7,397,357

Contacts:

Jim Bush	FHWA Vermont Division, HDA-VT	(802) 828-4423
Bruce Bender	Vermont Agency of Transportation	(802) 828-3984
Andy Lowe	Vermont Agency of Commerce	(802) 828-0528

WARREN COUNTY, VIRGINIA

Description:

The three component projects in the Warren County, Virginia Northern Shenandoah Valley Rural Deployment Initiative result from the Lord Fairfax Planning District Commission's ITS Deployment Planning Study.

-- The "Travel Shenandoah Commercial Information Demonstration Project" ($75K) will evaluate the market feasibility of providing real-time travel advisories and related information/assistance to motor freight dispatchers. Information will be provided via media requested by participating clients; e.g., e-mail, telephone, pager, fax.

-- The "University of Virginia's Department of Emergency Medicine Pegasus EMS Video Project" ($40K) will provide portable video conferencing between local rescue squads and the Pegasus emergency medical helicopter. The project will enhance rural/interstate emergency medical service by upgrading the level/quality of patient information and medical consulting through real-time video conferencing from the incident scene/within the rescue squad transport vehicle and the Pegasus emergency medical transport helicopter.

-- The "Northern Shenandoah Valley Public Mobility Project" will develop a ridesharing, vehicle sharing demand responsive agency-based central dispatching system to enhance the efficient use of human service transportation resources in the Northern Shenandoah Valley.

Project Location: Warren County, Virginia

Partner(s): Virginia DOT; Frederick County, VA; University of Virginia; ShenTel

Start Date: September 1999

***End Date*:** March 2003

Estimated Total ITS Funds: $197,867

Estimated Total Project Cost: $336,000

***Contacts*:**

Tom Jennings	FHWA Virginia DIvision, HDA-VA	(804) 775-3357
Gregory Cross	No. Shenandoah Valley Deploy. Initiative	(540) 459-9761

WAUSAU/STEVENS POINT, WISCONSIN

Description:

To implement this FY 1999 ITS Integration Program project, Wisconsin will conduct a planning study, develop a regional architecture and deploy interoperable technologies in the I-39 Wausau/Stevens Point Corridor which will be integrated into an overall statewide system.

Specific projects selected for ITS deployment will fulfill I-39 Corridor needs in traveler information, incident management and commercial vehicle operations. The intent of this corridor-wide project programming effort is to develop an accepted, standardized approach to deployment in the corridor.

Project Location: I-39 Wausau/Stevens Point Corridor

Partner(s): Wisconsin DOT; Department of Motor Vehicles

Start Date: September 1999

***End Date*:** October 2004

Estimated Total ITS Funds: $791,470

Estimated Total Project Cost: $1,582,940

***Contacts*:**

John Berg	FHWA Wisconsin Division, HDA-WI	(608) 829-7515

Rural Transit Mobility

NORTH FLORIDA RURAL TRANSIT INTELLIGENT TRANSPORTATION SYSTEMS

Description: This project will assist in providing regional, multi-agency application of Intelligent Transportation Systems (ITS) technologies to three different countywide rural transit systems in Flagler, Putnam, and St. Johns counties in north Florida. The resulting electronic coordinated transit service provides transportation for the public for the purpose of job training, employment, medical service, nutrition trips, rehabilitation, and other life-sustaining functions. This project will be a national model in initiating regional, electronically coordinated transit service in rural areas involving several transit organizations. ITS technologies being considered include automatic vehicle location (AVL) systems using global positioning systems (GPS), and automated scheduling, dispatching, and billing software. A draft final evaluation report has been submitted. The final report is scheduled for release by March 2003.

Project Location: Florida

Partner(s): Flagler County Transport; ARC Transit of Putnam County, St. John's County Council on Aging; Florida Commission for the Transportation Disadvantaged

Start Date: September 1997

***End Date*:** March 2003

Estimated Total ITS Funds: $200,000

Estimated Total Project Cost: $240,000

***Contacts*:**

William Wiggins	FTA Headquarters, TRI-11	(202) 366-0255
Jennifer Bowers	Florida Comm. for the Transp. Disad.	(904) 488-6036

BUFFALO COUNTY RURAL TRANSIT PROJECT

Description:

The Buffalo County, Nebraska ITS Project is designed to start the first phases of ITS technology in Buffalo County. The goal of the project is to place in Buffalo County the necessary technological framework that will allow for the following three events:

- Deploy the technology needed to accommodate additional growth in transit usage throughout the county.
- Provide interoperability with technology being deployed by other state, local and federal agencies.
- Establish a cooperative effort to enable future implementation of transportation technologies across agency lines.

Project Location: Buffalo County, Nebraska

Partner(s): FHWA, Nebraska Dept. of Roads

Start Date: April 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $52,500

Estimated Total Project Cost: $80,000

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977

Rural Traffic Management

RURAL ITS SWISS ARMY KNIFE TRAILER

Description:

Many rural locations lack a core set of permanently installed transportation management equipment components. Variable message signs, highway advisory radio, traffic control devices, communications media and speed detection devices are examples of components needed under circumstances, but not permanently deployed, in rural areas. This project will develop a set of compatible Swiss Army Knife (SAK) trailers as multi-purpose devices capable of supporting a broad range of applications as required. The intent of the SAK trailer is to provide a full complement of core equipment components in a single package to support: work zone management; special event management; incident management; natural disaster management; and traffic data collection.

Components visualized on the self-contained trailer include: a variable message sign; highway advisory radio; a portable traffic signal; weather sensor; radar speed detection; video surveillance; wireless communications; flood lights; and a power source.

Project Location: New York State-Various Rural and Small Urban Areas

Partner(s): New York State DOT, Local Government and Public Safety Agencies in various communities

Start Date: September 1999

***End Date*:** July 2003

Estimated Total ITS Funds: $248,823

Estimated Total Project Cost: $500,000

***Contacts*:**

Jerry Zell	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 228
Nick Barr	NYSDOT ITS Group	(518) 457-1951	

STATE OF IDAHO - TREASURE VALLEY ITS INTEGRATION PROGRAM

Description:

This project is a component of the FY 2000 State of Idaho Earmark. The project activity continues the FY 1999 earmark whose objective is to deploy and integrate a communications, surveillance, and traffic control system for Treasure Valley. The FY 2000 funding will continue FY 1999 earmarked investments which include:

- Development of CCTV and detection plans for arterials parallel to I-84 in Ada County.
- Deployment of ITS devices on arterials parallel to I-84 and freeway ramps in Ada County.
- Enhancement of incident management software and integration of other software systems.
- Development of a Controller Interface Device to assist Treasure Valley agencies with traffic signal timing strategies during incidents.
- Project evaluation.

Project Location: Boise, Idaho

Partner(s): FHWA, Idaho DOT, Ada County Highway District, Community Planning Association of Southwest Idaho, University of Idaho, Boise State University

Start Date: September 2000

***End Date*:** July 2003

Estimated Total ITS Funds: $390,000

Estimated Total Project Cost: $630,000

***Contacts*:**

Ross Blanchard	FHWA Idaho Division, HDA-ID	(208) 334-9180	Ext. 112
Jim Larsen	Ada County Highway District	(208) 387-6196	

Highway Operations & Maintenance

AN AUTOMATED VEHICLE LOCATION PILOT SYSTEM IN A MAINTENANCE OPERATIONS SETTING

Description: This project will evaluate the use of an Automated Vehicle Location (AVL) system to aid in the administration of snow removal and ice control contract forces, and provide information concerning road conditions to the public and media and the management and performance of snow removal and ice control operations. The benefits anticipated from this system include: continuous location of snowplow fleet operations; ability to identify vehicles with abnormal behavior; increased safety for the vehicle operator; ability to detect and minimize waste and fraud; ability to capture statistical data; and improved communications efficiency. The evaluation will also focus on the benefits of incorporating snow and ice removal status received from the AVL system into traveler information programs in the Northern Virginia District.

Project Location: Northern Virginia District

Partner(s): Virginia DOT

Start Date: August 1997

***End Date*:** March 2003

Estimated Total ITS Funds: $50,000

Estimated Total Project Cost: $850,000

***Contacts*:**

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
Dan Roosevelt	Virginia DOT	(804) 293-1924

CONVERSION OF MEDORA GWEN TO NATIONWIDE DIFFERENTIAL GPS

Description: This project is the FY 2001 ITS Integration Program Congressionally-directed deployment for the State of North Dakota. The project will convert a decommissioned U.S. Air Force Ground Wave Emergency Network (GWEN) site into a Differential Global Positioning System (DGPS) site to provide complete coverage of North Dakota. Conversion of the Medora, ND site will provide North Dakota with an enabling technology to support navigation system applications requiring accuracies associated with route guidance, fleet management of specialty vehicles such as snowplows, emergency service vehicles, and maintenance equipment especially in poor visibility winter conditions. Converting the Medora, ND GWEN site to Nationwide DGPS will fill a coverage void in the western part of the state, and operate as an enabling technology required to allow other technologies to function at a higher level.

Project Location: Medora, North Dakota

Partner(s): FHWA, FRA, North Dakota DOT, U. S. Coast Guard, National Geodetic Survey

Start Date: February 2002

***End Date*:** March 2003

Estimated Total ITS Funds: $146,807

Estimated Total Project Cost: $420,000

***Contacts*:**

Steven Busek	FHWA North Dakota Division, HDA-ND	(701) 250-4348
Ed Ryen	North Dakota DOT	(701) 328-2545

LAND MOBILE RADIO SYSTEM

Description:

This project is the FY 2001 ITS Integration Program earmark for the Municipality of Anchorage, AK. Funding in the amount of $1,047,000 was approved in September 2002. The principal function of the Land Mobile Radio System (LMRS) is to support maintenance and operations particularly snow and ice control. Data and information sharing between ADOT & PF and the Department of Public Safety will enhance response and efficiency for both departments. LMRS employed as a wireless mechanism for transmitting data from a handheld computer for emergency management of avalanche rescue and recovery in mountain passes to the state's maintenance management system is an example of the uses to which this technology may be applied.

Phase I of LMRS project will focus on deploying mobile and portable data link radios. The mobile radios will be installed in Department of Public Safety vehicles. Phase II of the project will replace existing base stations with data link radios. Phase I deployments of mobile and portable radios will provide approximately 55% coverage of the state, and will support sharing of intermodal transportation information related to:

- Road closures.
- Railroad closures.
- Traffic routing.
- The need for air space closures (coordination with the FAA to ensure air traffic safety in areas where explosives are in use).
- Avalanche mitigation coordination.
- Natural disaster response.
- Maintenance activity, and
- Road and weather conditions.

Project Location: Alaska

Partner(s): FHWA; Alaska Department of Transportation and Public Facilities (ADOT & PF); Alaska State Troopers; AK Emergency Medical Services

Start Date: September 2002

***End Date*:** August 2003

Estimated Total ITS Funds: $1,047,000

Estimated Total Project Cost: $2,094,000

***Contacts*:**

Al Fletcher	FHWA Alaska Division, HDA-AK	(907) 586-7245
Ocie Adams	ADOT&PF	(907) 465-6940
Mark Johnson	Chief, EMS	(907) 465-3027

OAKLAND COUNTY, MICHIGAN - SOUTHEAST MICHIGAN SNOW AND ICE MANAGEMENT (SEMSIM)

Description:

The Southeastern Michigan Snow and Ice Management (SEMSIM) project is a collaboration between the Road Commission for Oakland County, Wayne County, The Road Commission for Macomb County, and the City of Detroit. Additionally, the Suburban Mobility Authority for Regional Transportation (SMART) is a partner in the project, and the University of Michigan Intelligent Transportation Systems Research Center of Excellence is the project facilitator. SEMSIM will enhance the management of winter road maintenance in Southeast Michigan through cross-jurisdictional cooperation and the application of state-of-the-art technology. The SEMSIM project will be a unique integration of automated vehicle location (AVL) using the global positioning system (GPS), geographic information systems (GIS), and communications technologies designed specifically to enhance the efficiency and effectiveness of winter maintenance operations in urban, suburban, and rural areas. The ultimate result will be minimizing the amount of time which roads are hazardous thereby improving roadway safety. Improved mobility and reduced congestion will be a result of roadways which return to maximum capacity quicker by including software displaying road network status, vehicle status, and meteorological data in real time.

The project will integrate existing, or soon to be deployed, ITS infrastructure components. The backbone of this project is the communications between the maintenance vehicles and the central computers. Maintenance trucks will be equipped with sensors that integrate data such as: plow position; salt on/off with spreading rate; pavement and air temperature; vehicle location and speed.

This project is phased. Phase I was begun in October 1998 and was completed in July 2001. Phase I was evaluated and a report issued in June 2000. Before beginning the next phase, the contractor met with the subcommittees established by the partner agencies to define future direction. After negotiations, a combined Phase II and III contract was signed in June 2001. In this phase, an additional 290 vehicles were outfitted by June 2002. A significant facet of the next phase is that vehicle data will be distributed to the partner agencies over the Internet, through a browser-based system. In-vehicle hardware and sensors will be improved, as well as the software. Currently the communications network is being upgraded, with the vehicle hardware installation scheduled to start in December of 2002.

Project Location: Oakland Co., Wayne Co., Macomb Co., City of Detroit, Michigan

Partner(s): Michigan DOT; Road Commission for Oakland County (RCOC); Wayne County, MI; Road Commission for Macomb County, MI; City of Detroit, MI; Suburban Mobility Authority for Regional Transportation; Univ. of Michigan ITS Research Center of Excellence

Start Date: September 1998

***End Date*:** March 2003

Estimated Total ITS Funds: $4,300,733

Estimated Total Project Cost:

$8,187,829

Contacts:

Larry Swartzlander	FHWA Headquarters, HOTM	(202) 366-6066
Morrie Hoevel	FHWA Michigan Division, HDA-MI	(517) 702-1834
Mark Bush	Michigan State DOT	(517) 335-2224
Dennis Kolar	Road Commission for Oakland County	(248) 858-4889

PHASE 2 - ROAD WEATHER INFORMATION SYSTEMS

Description:

This project is a component of the FY 2001 ITS Integration Program earmark for the State of Alaska. Federal funding was obligated in June 2002. This project builds on what was originally a FY 1999 earmark which was deferred to FY 2001, and deployed eight roadway information weather information system (RWIS) sites in the Central Region of the State. This project deploys up to twenty-five additional RWIS sites strategically located throughout Alaska's Northern, Central, and Southeast regions.

The Alaska RWIS extends beyond roadway infrastructure and encompasses rail, marine and aviation requirements. The particular focus on the RWIS deployed in this activity will be to provide weather and pavement information in support of maintenance and operations, with priority on snow and ice control. RWIS technology to be deployed includes specialized equipment and computer programs that monitor air and pavement temperatures and related factors impacting on highways in winter conditions. The expectation is that the application of de-icing chemicals, use of road treatment materials, and the implementation of anti-icing techniques will be significantly improved as a result of deploying the RWIS sites.

Project Location: Alaska Statewide

Partner(s): FHWA, Alaska Department of Transportation and Public Facilities

Start Date: June 2002

***End Date*:** June 2003

Estimated Total ITS Funds: $937,569

Estimated Total Project Cost: $1,875,137

***Contacts*:**

Al Fletcher	FHWA Alaska Division, HDA-AK	(907) 586-7245
Jeff Ottesen	ADOT&PF	(907) 465-6971

WASHINGTON STATEWIDE ADVANCED SNOWPLOW SYSTEMS

Description: This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The purpose of the project is to integrate radio data transfer and processing into the storm management program in the North Central Region of Washington State. In order to optimize storm management operations, significant amounts of data, such as snowplow locations, requirements for sand, anti-icing and solid de-icing materials, must be integrated. The project will deploy communications equipment on mountain top radio repeaters and on vehicles. Equipment to be deployed includes GPS location equipment, and on-vehicle electronic sensors, pavement temperature sensors, pre-set communications transmitting devices enabling drivers to report automatically roadway surface conditions and weather parameters. Data from all of these collection sources will be communicated via radio to a centally located server to support populating a database for storm managers.

Project Location: North Central Region, Washington

Partner(s): FHWA, Washington State DOT

Start Date: September 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $413,650

Estimated Total Project Cost: $827,300

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Dave Bierschbach	WSDOT	(509) 667-3066

Integrated Systems

ITS DEPLOYMENT AND INTEGRATION PROJECT, OXFORD, MISSISSIPPI

Description:

This project was initiated as the FY 2000 ITS Integration program earmark for Oxford, Mississippi. The project is categorized as a rural area deployment project, and is being managed by the University of Mississippi's Center for Advanced Infrastructure. The project was extended and expanded by FY 2002 ITS Integration Program earmark funding for Oxford in the amount of $413,659, which was matched from a variety of funding sources for a total FY 2002 allocation of $827,318.

This project presents the City of Oxford's vision for deployment and integration of ITS technology in a small urban/rural area with varied transportation-related activities associated with the University of Mississippi, a federal court, and a regional hospital, all of which contribute to the City's status as a business, commercial and education center for a large geographical area. The project examines the increased traffic congestion, and safety challenges. The project seeks to integrate advanced digital mapping, Geographical Information System (GIS), database management, the Internet, emergency response services, transit, and public safety components with real-time advanced traffic management to benefit all users of the transportation system.

The backbone of the project is the development of a digital terrain mapping database for Oxford and surrounding communities using airborne laser and photo technology which are then incorporated into a comprehensive GIS. The database will be integrated with advanced traffic surveillance equipment, and used for incident management by law enforcement agencies, emergency response services as well as online information access by travelers. Additionally, the project will implement a plan for a pilot public transit service, leveraging automatic vehicle location technology.

FY 2002 funding will implement plans to alleviate traffic congestion, and parking problems. A central focus will be on event management centered on the University of Mississippi. Key elements include:

- Activating a Traffic Operations Control Center (TOCC) with video monitoring capability.
- Development of a transit plan.
- Implementation of traffic control systems integrated with the TOCC to support event management and emergency response.
- Implementation of a parking management plan.

Project Location: Oxford, Mississippi

Partner(s): FHWA; FTA; Mississippi DOT; University of Mississippi Center for Advanced Infrastructure Technology; City of Oxford, Mississippi

Start Date: October 2001

***End Date*:** December 2003

Estimated Total ITS Funds: $1,593,291

Estimated Total Project Cost:

$3,186,582

Contacts:

Mike Cribb	FHWA Mississippi Division, HDA-MS	(601) 965-4228
Scott Carson	FHWA Mississippi Division, HDA-MS	(601) 965-4232
Jeff Altman	Mississippi DOT	(601) 359-7675
Dr. Hugh Sloan	UM School of Business Administration	(662) 915-7414

ITS INTEGRATION AMONG VDOT AND THE SHENANDOAH VALLEY

Description: This project is the FY 2000 Integration Program earmark for the Shenandoah Valley, Virginia. The project is a compendium of disparate initiatives designed to improve mobility, traveler information and safety. Earmarked funding complemented by matching increments are to be applied to a series of initiatives, some of which build on the FY 1999 earmark for Warren County, Virginia. Highlights include further development of the Travel Shenandoah Commercial Information Demonstration Project (FY 1999 Warren County Earmark), and support to Virginia Tech and George Mason Universities, which are involved in project evaluation and System Integration of all ITS initiatives. Specific infrastructure enhancements will focus on Signal System Enhancement (e.g., video and closed loop coordination) in Staunton District, and corridor enhancements targeting specific intersections in Frederick County in the corridor used for rapid access to the Winchester Medical Center. Continued development of the FY 1999 earmark "Public Mobility Project" will feature installation of a coordinated-network computer aided dispatching system and vehicle location to enhance and augment the provision of human service transportation activities. Finally, resources will be applied to staffing ITS Project Manager and ITS Technician positions to ensure appropriate administration, planning, budgeting, design and maintenance of ITS system applications.

Project Location: Staunton District of the Virginia Department of Transportation

Partner(s): Virginia Dept. of Transportation, Travel Shenandoah Telecommunications Company, Lord Fairfax Planning District Commission

Start Date: September 2000

***End Date*:** November 2003

Estimated Total ITS Funds: $1,966,053

Estimated Total Project Cost: $6,153,000

Contacts:

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
Robert Slocum	Virginia DOT	(540) 332-7720

REGIONAL GIS/ITS INITIATIVE

Description:

This project originated with the FY 2000 ITS Integration Program earmark for North Central Pennsylvania. The North Central Pennsylvania Regional Planning and Development Commission (NCPRPDC), partnering with the Area Transportation Authority (ATA), the emergency management agencies (EMAs) of Cameron, Clearfield, Elk and Jefferson counties and county planning and development offices, are coordinating a regional Geographical Information System (GIS)/Intelligent Transportation System (ITS) Initiative. The comprehensive regional technology plan has been underway since 1997 and is being conducted in four phases:

Phase I - Mapping, Rural Addressing and Intranet/Internet Availability

Phase II - Regional Wireless Data Network (FY 2000 ITS Funding)

Phase III - Mobile Voice/Data Radio Network

Phase IV - Automated Vehicle Location (AVL)

The FY 2000 earmark focused on Phase II, developing a reliable, multi-agency, communication network to facilitate sharing of regional information. The need for a backbone infrastructure component that will support real-time information sharing exists for regional public safety, incident management, emergency response, transportation planning and management, transit management, para-transit, and demand-responsive transit and traveler information. FY 2000 activities initiated the construction of a wide area network (WAN) using proven and cost-effective wireless (spread-spectrum) technology. The WAN will provide the infrastructure necessary to exchange data among multiple agencies and to serve as the backbone for Phase III and IV of the Regional GIS/ITS Initiative.

The FY 2001 ITS Integration Program earmark for Johnsonburg and North Central Pennsylvania is the continuation and completion of a comprehensive regional ITS initiative begun with FY2000 funding, and will incorporate the establishment of the Mobile Voice/Data (V/D) Radio communications network, associated mobile-data integrated systems and, ultimately, AVL capabilities (Phases III and IV). The Mobile V/D Radio will provide the link to integrate the data sharing WAN with the public service (transit) and public safety vehicles in the field. In addition to the Mobile V/D Radio, the project will provide the automated systems to schedule, manage and maintain the public service (transit) vehicles as well as provide the infrastructure for automated fare collection and reporting. A fully integrated AVL system will "close the loop" in the project, bringing location information back from public safety and transit vehicles in the field and providing the capability to track those vehicles during both routine operations and critical or emergency conditions.

Current Projected Estimated Cost figures include FY 2000 and FY 2001 allocations. FY 2001 ITS funding is $1,789,569.

Project Location: North Central Pennsylvania

Partner(s): FHWA, Pennsylvania DOT, NCPRPDC, ATA, Counties of Cameron, Clearfield, Elk, Jefferson

Start Date: September 2000

End Date: March 2004

Estimated Total ITS Funds: $2,575,990

Estimated Total Project Cost: $4,633,994

Contacts:

Jessie Yung	FHWA Pennsylvania Division, HIT-PA	(717) 221-4422
Amy Kessler	NCPRPDC	(814) 773-3162
Kathy Petras	ATA	(814) 965-2111

Completed Projects

ADVANCED RURAL TRANSPORTATION INFORMATION AND COORDINATION

Description: The Advanced Rural Transportation Information and Coordination (ARTIC) project is part of the Minnesota Statewide ITS program, Guidestar. ARTIC coordinates the communications systems of several public agencies (highway, state patrol, and transit) by establishing a centralized communication site. Improvements have been documented in response times to accident and road condition emergencies, and real-time vehicle status and schedule information is being provided through ARTIC. The primary objective of ARTIC was to evaluate the improvement in the transportation system and traveler safety by establishing a centralized communication site.

Project Location: Itasca and St. Louis Counties, Minnesota

Partner(s): Minnesota DOT, Minnesota State Patrol, Arrowhead Transit, City of Virginia Transit, Arrowhead Regional Development Commission, and U.S. West

Start Date: July 1994

***End Date*:** August 2000

Estimated Total ITS Funds: $903,000

Estimated Total Project Cost: $1,542,000

***Contacts*:**

Jim McCarthy	FHWA Minnesota Division, HDA-MN	(651) 291-6112	
Richard Maddern	Minnesota DOT	(218) 749-7793	Ext. 3804

ADVANCED TRANSPORTATION WEATHER INFORMATION SYSTEM

Description: This project provided an evaluation and demonstration of how current technologies in mesoscale meteorological analysis and forecasting can be effectively used to produce precise spatial and temporal weather information for integration into an Advanced Transportation Information System for safer and more efficient operations. Through this evaluation and demonstration, a prototype information and management center to support traffic weather analysis and forecasting in a responsive decision support environment was developed. This system is capable of providing immediate assessment of difficulties in travel arising from changing weather conditions. This project demonstrated a prototypical advanced weather information system which may be implemented on a larger national scale.

Project Location: North Dakota and South Dakota

Partner(s): North Dakota DOT, South Dakota DOT, University of North Dakota, U.S. West Communications, North Dakota Highway Patrol, South Dakota Highway Patrol, NOAA/Forecast Systems Lab, and Surface Systems Inc., and Meridian Environmental Technologies.

Start Date: May 1995

***End Date*:** November 2000

Estimated Total ITS Funds: $3,525,000

Estimated Total Project Cost: $4,536,971

***Contacts*:**

Steve Busek	FHWA North Dakota Division, HDA-ND	(701) 250-4348
Leon Osborne	University of North Dakota	(701) 777-2479

ALASKA COLD WEATHER ITS SENSING

Description: This project funded the initial development of a Roadway Weather Information System (RWIS) for the Alaska Department of Transportation and Public Facilities. This initial improvement included two small operational RWIS systems, centered in the Anchorage and Valdez areas, and also installed several data collection sites in Juneau. The system provided weather and pavement information to support maintenance and operations activities, particularly winter snow and ice control on highways.

Project Location: Anchorage and Valdez, Alaska

Partner(s): Alaska DOT and PF

Start Date: October 1998

***End Date*:** October 2001

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,250,000

***Contacts*:**

Al Fletcher	FHWA Alaska Division, HDA-AK	(907) 586-7245
Douglas Terhune	Alaska DOT and PF	(907) 269-0885

ARIZONA I-40 TRAVELER AND TOURIST INFORMATION SYSTEM

Description:

The I-40 Interstate Corridor is the only access to a number of National Parks and tourist centers in the region. The purpose of this project was to evaluate various means of providing traveler information to visitors traveling to and from the Grand Canyon National Park, Petrified Forest National Park, Navajo Nation, various welcome/tourist information centers, Arizona Department of Tourism's Painted Cliffs Welcome Center, Little America truck stop in Flagstaff, Kingman port-of-entry, and 25 other recreation areas. The project incorporates multimodal components such as commercial vehicle operations, transit, parking management and information systems.

Project Location:

Arizona I-40 Corridor

Partner(s):

Arizona DOT; Grand Canyon National Park; National Weather Bureau; Winslow Chamber of Commerce; Arizona Department of Public Safety; AZ Office of Tourism; Northern Arizona University; Arizona State University; City of Bullhead; Computran Systems Corp.; Kimley-Horn & Assoc.; Castle Rock Consultants, Inc.; Fastline; Smartroute Systems, Inc., Transmit Technologies, Inc.

Start Date:

October 1997

***End Date*:**

July 2000

Estimated Total ITS Funds:

$250,000

Estimated Total Project Cost:

$3,350,000

***Contacts*:**

Alan Hansen	FHWA Arizona Division, HPR1-AZ	(602) 379-3645	Ext. 108
Tim Wolfe	Arizona DOT	(602) 255-6622	

BLACKSBURG RURAL TRAVELER INFORMATION SYSTEM

Description: This project operationally tested a rural transit traveler information system that makes the transit system easier to use and more reliable for the user. Based upon a system-wide AVL, a real-time traveler information system was provided through kiosks, wayside stops, and an existing "electronic village". Blacksburg Transit (town of Blacksburg, VA) operates twenty-seven buses on eight fixed-routes. Daily ridership is 8,500 during the academic year. The transit system covers 642,000 miles annually, which includes a five-vehicle demand-responsive system.

Project Location: Blacksburg, Virginia

Partner(s): Town of Blacksburg, Virginia

Start Date: July 1996

***End Date*:** June 1999

Estimated Total ITS Funds: $240,000

Estimated Total Project Cost: $477,024

***Contacts*:**

Ron Boenau	FTA Headquarters, TRI-11	(202) 366-0195
Mike Connelly	Blacksburg Transit	(540) 961-1185

BRANSON, MISSOURI TRIP (TRAVEL AND RECREATIONAL INFORMATION PROJECT)

Description:

Branson, a rural community located in the heart of the Ozark Mountains, has become known as the live entertainment capital of the world. The pristine natural surroundings of Branson have always attracted large numbers of visitors. The Branson TRIP sought to provide Branson Tri-Lakes area tourists with comprehensive tourist attractions, weather, traffic and road construction information. This information was provided through technologies such as the World Wide Web, dial-in telephone services, changeable message signs, highway advisory radio, commercial radio, kiosks, and cable television. The project evaluated those means of conveying information.

Project Location:

Branson, Missouri

Partner(s):

Missouri DOT; City of Branson, MO; Missouri Division of Tourism; Stone County, Taney County, Southwest Missouri Advisory COG; Branson/Lakes Area Chamber of Commerce; Table Rock Lake Chamber of Commerce, Castle Rock/Black Veatch; Addco; Intuitive Solutions; The Branson Connection; The Vacation Channel

Start Date:

October 1997

***End Date*:**

July 2000

Estimated Total ITS Funds:

$600,000

Estimated Total Project Cost:

$1,325,000

***Contacts*:**

Bob Thomas	FHWA Missouri Division, HDA-MO	(573) 636-7104
Tom Ryan	Missouri DOT	(573) 526-0124

COLORADO MAYDAY SYSTEM

Description: This project evaluated the use of the Global Positioning System (GPS) for vehicle location and the impact of cellular infrastructure communications between the vehicle and Public Service Answering Points (PSAPs) providing emergency and non-emergency assistance in an area of over 12,000 square miles in north-central Colorado. The test involved vehicles equipped with a low-cost location device called TIDGET. The TIDGET sensor sends raw GPS satellite signals to the control center for processing to determine the location of the vehicle. The primary objective of this test was to evaluate the impact of an infrastructure-based GPS system and response network on emergency response activities, time and public safety. Additionally, this test identified the necessary structure, responsibilities and service levels of a traveler assistance center necessary to commercially operate such a system.

Project Location: Central - Northeast Colorado

Partner(s): NAVSYS Corporation, ESRI, AT&T Wireless Inc., Castle Rock Consultants, and members of the ENTERPRISE group (Departments of Transportation from the State of Arizona, Maricopa County , Colorado, Iowa, Michigan, Minnesota, North Carolina, Washington State, Dutch Ministry of Transport, Ministry of Transportation of Ontario, and Transport Canada)

Start Date: June 1995

***End Date*:** December 1998

Estimated Total ITS Funds: $2,439,654

Estimated Total Project Cost: $3,832,286

***Contacts*:**

Scott Sands	FHWA Colorado Division, HDA-CO	(303) 969-6730	Ext. 362
John Kiljan	Colorado DOT	(303) 512-5858	

EVALUATION OF RADIO AND MICROWAVE TECHNOLOGY FOR MOTOR VEHICLE SAFETY WARNING SYSTEMS

Description: This cooperative agreement had two (2) objectives:

(1) To assist the Federal Highway Administration (FHWA) in evaluating the utility of a prototype motor vehicle safety warning system that utilizes police radar frequency transmissions to alert drivers (in real-time) of hazardous road conditions;

(2) To characterize system technical requirements for an effective warning system, and to evaluate the performance of the prototype system.

Project Location: Georgia

Contractor(s): Georgia Technical Research Institute; Georgia Department of Transportation

Start Date: September 1996

***End Date*:** December 1997

Estimated Total ITS Funds: $200,000

Estimated Total Project Cost: $200,000

***Contacts*:**

Paul Pisano	FHWA Headquarters, HOTO	(202) 366-1301

HERALD EN-ROUTE DRIVER ADVISORY SYSTEM VIA AM SUBCARRIER

Description: The main concept of this project was to disseminate traveler information in difficult-to-reach, remote rural areas using a subcarrier on an AM broadcast station. The three basic components of Herald -- message generation, message transmission and message reception -- were developed under an effort by the multi-state organization called ENTERPRISE. This project assessed the performance of the system and analyzed the impacts on broadcasters, travelers and equipment manufacturers. The primary objective of this test was to assess real world impacts of the system related to transmission of traveler information in challenging terrain (Colorado), potentially interfering environmental conditions (Iowa), improvements to safety, and the overall marketability of the system.

Project Location: Colorado and Iowa

Partner(s): Modulation Sciences and members of the ENTERPRISE group (Departments of Transportation from the States of Arizona, Colorado, Iowa, Michigan, Minnesota, North Carolina and Washington State, and the Dutch Ministry of Transport, Ministry of Transportation of Ontario, and Transport Canada)

Start Date: January 1995

***End Date*:** September 2000

Estimated Total ITS Funds: $200,000

Estimated Total Project Cost: $380,000

***Contacts*:**

Scott Sands	FHWA Colorado Division, HFO-CO	(303) 969-6730	Ext. 362
John Whited	Iowa DOT	(515) 239-1411	

IDAHO STORM WARNING SYSTEM

Description: The purpose of the Idaho Storm Warning Operational Test was to investigate various sensor systems that could provide accurate and reliable visibility and weather data, and to use those 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.

Project Location: Interstate 84 in southeastern Idaho.

Partner(s): Idaho Transportation Department, CH2M Hill, Handar Incorporated, Santa Fe Technologies, and Surface Systems Incorporated

Start Date: June 1993

***End Date*:** January 2001

Estimated Total ITS Funds: $804,500

Estimated Total Project Cost: $1,231,900

***Contacts*:**

Ross Blanchard	FHWA Idaho Division, HDA-ID	(208) 334-9180	Ext. 112
Larry Vanover	Idaho Transportation Department	(208) 334-8558	

IDENTIFICATION OF SIMPLE SOLUTIONS FOR THE RURAL TRANSPORTATION SYSTEM

Description: There were four (4) tasks associated with this cooperative agreement:

(1) An information search to identify the successful, small-scale technology applications appropriate for rural areas;

(2) An assessment and evaluation of the most promising applications;

(3) The documentation of these solutions and other findings;

(4) The presentation of these findings at the appropriate venues.

Final report, Technology in Rural Transportation: Simple Solutions, has been published.

Project Location: Colorado

Contractor(s): Castle Rock Consultants; Colorado Department of Transportation; Enterprise

Start Date: September 1996

***End Date*:** July 1997

Estimated Total ITS Funds: $80,000

Estimated Total Project Cost: $80,000

***Contacts*:**

Paul Pisano	FHWA Headquarters, HOTO	(202) 366-1301

ROGUE VALLEY MOBILITY MANAGEMENT

Description: This project demonstrated the Mobility Manager concept to integrate transportation users, providers, and funding sources. Advanced electronic technology was used to record financial transactions and included magnetic-stripe farecards. It included transportation service to the elderly and disabled unable to use fixed route transit.

Project Location: Medford, Oregon

Partner(s): 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, and Oregon DOT

Start Date: September 1991

***End Date*:** June 1995

Estimated Total ITS Funds: $380,000

Estimated Total Project Cost: $775,900

***Contacts*:**

Ron Boenau	FTA Headquarters, TRI-11	(202) 366-0195
Mary Delamare-Schaefer	Rogue Valley Council of Governments	(503) 664-6674

RURAL APPLICATIONS OF ADVANCED TRAVELER INFORMATION SYSTEMS

Description:

This study examined Advanced Traveler Information Systems (ATIS) for rural applications. The research examined a broad range of rural environments, categories of travelers, ATIS applications, and advanced electronic and communication technologies. The study involved 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 were assessed. Based upon these analyses, priorities and plans for subsequent prototyping and operational field testing were developed. The most promising rural ATIS applications were developed and tested in a limited rural environment; including an evaluation of satellite communications for Mayday and a Surveillance and Delay Advisory System. A similar process to assess rural transit user and operator needs and system concept development was conducted. Several reports have been published.

Focus group discussions and telephone survey of rural travel needs and concerns have been completed. Some 20 preliminary concepts developed to meet rural travel needs were evaluated in terms of potential cost, benefits, implementation issues and trade-offs. A rural Action Plan was developed. Mayday satellite communications study, and preliminary testing of a Surveillance and Delay Advisory System (SDAS) have been completed. Further SDAS testing was completed in the summer of 1998. Test results have been evaluated.

Project Location: Virginia

Contractor(s): TransCore (formerly JHK & Associates) (lead), Hughes, Virginia Tech, and Bell-Atlantic

Start Date: January 1993

***End Date*:** March 2000

Estimated Total ITS Funds: $2,140,853

Estimated Total Project Cost: $2,153,353

***Contacts*:**

Paul Pisano	FHWA Headquarters, HOTO	(202) 366-1301

TRANSCAL

Description: This project was a comprehensive Inter-Regional Traveler Information System, integrating road, traffic, transit, weather, and value-added traveler services information sources from the entire geographic region. The location of the project is along the I-80/US 50 corridor between San Francisco, California and Lake Tahoe/Reno, Nevada. Land line and cellular telephone, and wireless FM subcarrier networks were used to transport information to and from travelers via telephones, personal digital assistants, in-vehicle devices and kiosks. Additionally, the test assessed the ability to integrate information from multiple sources (urban, rural, rough terrain, severe weather, etc.), and the ability to integrate traveler services and transit information with real-time regional congestion and incident content.

Project Location: California and Nevada

Partner(s): TRW/ESL, Shadow Broadcast, Cue Network Corporation, Ellen Williams and Associates, Geotechnology Development Inc., ETAK, Navigation Technologies, Sony Corporation, NET, Metropolitan Transportation Commission, Sacramento Area Council of Governments, The Tahoe Transportation District, Regional Transportation Commission of Washoe County (Nevada), California DOT (Caltrans), Nevada DOT, University of California at Davis, California Highway Patrol, Nevada Highway Patrol, Sierra Counties Consortium, and California Alliance for Advanced Transportation Systems

Start Date: July 1994

***End Date*:** June 1999

Estimated Total ITS Funds: $3,303,000

Estimated Total Project Cost: $7,355,000

***Contacts*:**

Frank Cechini	FHWA California Division, HTA-CA	(916) 498-5005
Elaine Houmani	CalTrans	(916) 657-3957

TRAVEL - AID

Description:

This project uses 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 were installed to monitor traffic, speeds, road and weather conditions. This information helps to determine a safe speed. Warnings about road conditions, accidents, or slow-moving equipment were broadcast via the various devices. The in-vehicle message device incorporates an alert signal to inform the motorist that a message is available. Up to 200 vehicles were equipped with devices to deliver information similar to that displayed from the roadway variable message sign system.

Project Location:

Snoqualmie Pass, Washington State

Partner(s):

Washington State DOT, Farradyne Systems Inc., Engineering Research Associates (ERA), General Logistics, Surface Systems Incorporated (SSI), University of Washington - Washington State Transportation Center (TRAC), and Traffic Master

Start Date:

November 1992

***End Date*:**

December 2001

Estimated Total ITS Funds:

$1,828,525

Estimated Total Project Cost:

$4,700,291

***Contacts*:**

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Larry Senn	Washington State DOT	(206) 543-6741

IV. PUBLIC SAFETY

IV. PUBLIC SAFETY

The ITS Public Safety Program is working with public safety stakeholders to demonstrate procedures and technologies to improve traffic safety and efficiency. Projects are underway or planned to address different aspects of incident response and management. These projects will develop and test procedures and technologies to improve incident detection and notification, to speed clearance by secondary responders, to facilitate on-site coordination among all responders, and to enhance the movement of emergency vehicles through traffic. The ITS Public Safety Program supports the U.S. DOT and the FHWA goals of improving safety, mobility and productivity by enabling more effective police, fire, and emergency medical operations.

Public safety and transportation officials recognize that despite great advances in emergency services over the past decades, significant improvements in efficiency and effectiveness can be realized by applying information technologies to incident prevention, detection, response, and management.

The core mission of the public safety community as a whole – on or off the highway – is protection of life, property, and environment. In the context of highway operations, this means rapid response to motor vehicle crashes or other incidents to prevent further loss of life, mitigate the consequences of injuries, minimize ancillary damage to vehicles, infrastructure, or the environment and restore normal operations. Enhanced detection and communications technologies such as wireless E9-1-1 and automatic crash notification will engage public safety resources sooner, provide more appropriate medical care to save lives and minimize injury consequences, and reduce transportation infrastructure disruption. Improved response technologies, such as green light priority for emergency vehicles, will speed the delivery of emergency resources to the scene. Developments in on-scene incident management and coordination will improve the safety of emergency responders and reduce delays in stabilizing, investigating and clearing the crash scene.

The potential is clear and the opportunities are compelling. Information technologies offer a rapidly expanding range of possibilities for coordinating community public safety and transportation systems. The challenge is to ensure public safety and transportation professionals generate, as well as share safety information, and coordinate in developing, testing, and implementing system enhancements.

This ITS Public Safety effort links the operations of a number of agencies with concerns in transportation and public safety. Within the U.S. DOT, the program is coordinated among the Federal Highway Administration, the National Highway Traffic Safety Administration, the Federal Transit Administration, the Federal Motor Carrier Safety Administration, the Federal Railroad Administration, and the Research and Special Programs Administration. Beyond the U.S. DOT, the program is coordinated closely with the Department of Justice and the Federal Emergency Management Administration.

The projects included in this section were in progress as of September 30, 2002

Public Safety Systems

EMERGENCY VEHICLE NETWORK DELAY (EVND) PHASE 2

Description:

Traffic signal preemption temporarily alters normal signal time allocations in some manner. It gives preference to the movement of the preempting emergency vehicle (EV) through intersections, with limited regard to the effect the preemption may have on other vehicles on the facility. The character and significance of the effect depends on the geometric characteristics, the size and complexity of the facility, the traffic loading and traffic mix, the number and characteristics of the emergency vehicles requesting preemption, and the signal control methodology and the signal timing patterns in use.

The objective of this project is to evaluate the impact that granting a signal preemption to an emergency vehicle has on subsequent emergency vehicle(s), when the vehicles are operating over a network of roads, where many or most of the intersections are signalized, and the signals are coordinated.

Project Location: McLean, Virginia

Contractor(s): ITT Industries, Inc.

Start Date: July 2002

***End Date*:** August 2003

Estimated Total ITS Funds: $211,715

Estimated Total Project Cost: $211,715

***Contacts*:**

John Halkias	FHWA Headquarters-HOTM	(202) 366-2183
Gene McHale	FHWA - TFHRC, NRDO-03	(202) 493-3275
Pete Holm	ITT	(719) 637-6405

WIRELESS E9-1-1 DEPLOYMENT ASSISTANCE

Description:

USDOT is sponsoring a WE9-1-1 Initiative to accelerate the availability of wireless emergency location service across the United States, and thereby enhance transportation safety and security. One goal of the WE9-1-1 Initiative is to work with public safety associations and leaders to provide technical assistance, guidance, and training to accelerate state and local readiness for wireless E9-1-1.

The objectives of this project are to support the WE9-1-1 Initiative by developing the necessary tools, technical guidance, and training and outreach materials to facilitate implementation of the wireless E9-1-1 services throughout the 50 states. A related objective is to foster coordination among the many players in this field to ensure efficient approaches to the implementation process.

Project Location: Columbus, Ohio

Contractor(s): National Emergency Number Association (NENA), Association of Public-Safety Communications Officials

Start Date: October 2001

***End Date*:** September 2003

Estimated Total ITS Funds: $849,877

Estimated Total Project Cost: $849,877

***Contacts*:**

K. Craig Allred	FHWA ITS JPO, HOIT	(202) 366-8034
Jim Goerke	NENA	(800) 332-3911

INTEGRATED INCIDENT MANAGEMENT SYSTEM FIELD OPERATIONAL TEST

Description:

Effective incident management achieves the ITS goals of improved safety, reduced congestion, improved mobility, and increased efficiency and productivity. The goal of this project is to improve incident management and emergency response by enhancing communication of incident data among first responders, and between first and secondary responders, both on-scene and at base facilities.

As part of the IIMS project, a number of first-response New York City Police Department (NYPD) and New York City Department of Transportation (NYCDOT) Office of Emergency Response (OER) vehicles will be equipped with mobile data terminals, GPS, digital cameras and links to a wide area network (WAN). These improvements will allow real-time transmission of accurate incident location, severity and impact to secondary responders with the NYC Department of Transportation. This in turn will assist NYCDOT in dispatching appropriate equipment without needing to first visit the incident site, all of which should lead to faster incident clearance times, reduced secondary crash risk and operational savings for the incident responders.

Incident responders will use a combination of handheld and palmtop computers to collect and transmit the incident information required to clear a particular incident type. An incident management system will aid operations center staff in managing the incident effectively. During a major incident, the incident management system will also be used at the incident scene equipping an on-scene incident command center.

Project Location: New York, New York

Partner(s): FHWA, New York State DOT, New York City DOT, NYPD, Calspan-University at Buffalo Research Center; Veridian Engineering, City University of New York, Polytechnic University

Start Date: February 2001

End Date: February 2004

Estimated Total ITS Funds: $900,000

Estimated Total Project Cost: $9,000,000

Contacts:

K. Craig Allred	FHWA ITS JPO, HOIT	(202) 366-5892
Art O'Connor	FHWA New York Division NYC Metro Office	(212) 668-2206
Ed Mark	New York State DOT	(914) 431-5723
Carol Thielman	Veridian Engineering	(716) 631-6929

HARRISON COUNTY PUBLIC SAFETY AUTOMATED SYSTEM PROJECT (ASP)

Description: This project is the FY 2002 ITS Integration Program earmark for Harrison County Mississippi. The project focuses on developing a reliable, multi-agency public safety communications network to facilitate regional information sharing. This phase of the project builds on previously initiated 800 MHz trunked radio system aimed at providing interoperable voice communications among law enforcement agencies in the Harrison County. Expanded project activity will provide tri-county (Harrison, Hancock and Jackson Counties) data transmission infrastructure facilitating both fixed site and mobile information sharing. Congressionally-directed funding will be used to acquire public safety support software required to exchange information and data between systems and laptop computers. Funding for this project is also provided by a $6 million U.S. Department of Justice federal appropriation.

Project Location: Harrison County, Mississippi

Partner(s): FHWA, Mississippi DOT; Harrison County; Harrison County, Jackson County and Hancock County Sheriffs' Departments, ASP Steering Committee

Start Date: October 2002

***End Date*:** September 2004

Estimated Total ITS Funds: $413,659

Estimated Total Project Cost: $826,000

***Contacts*:**

Mike Cribb	FHWA Mississippi Division, HDA-MS	(601) 965-4228
Scott Carson	FHWA Mississippi Division, HDA-MS	(601) 965-4232
Major Julian Allen	Harrison County Sheriff Department	(228) 865-4595

WISCONSIN COMMUNICATIONS NETWORK

Description:

This project is the FY 2002 ITS Integration Program earmark for the State of Wisconsin. The project objective is to expand the Wisconsin Statewide digital microwave backbone infrastructure used to carry voice and data communications information for 122 public safety agencies throughout the State. Expansion is necessary to provide coverage into some rural areas currently incapable of accessing public safety-related radio traffic. Most of the information transported on the backbone infrastructure is critical. Agencies not able to receive traffic pertinent to their activities are at risk as are those elements of the general public either directly or indirectly involved in incidents.

Particularly vulnerable are public safety personnel who frequently operate alone, and are entirely dependent on radio communications. The statewide microwave backbone infrastructure will enable public safety personnel to access mission critical information. Funding allocated for this project will be used to acquire radio communications equipment needed to create a microwave path to towers in areas lacking radio coverage. Equipment included is comprised of power backup generators, VHF base and repeater stations, microwave terminals and dishes, VHF antennae and security equipment.

Project Location: Wisconsin

Partner(s): FHWA, Wisconsin DOT, Wisconsin State Patrol

Start Date: September 2002

***End Date*:** May 2003

Estimated Total ITS Funds: $256,469

Estimated Total Project Cost: $512,938

***Contacts*:**

John Berg	FHWA Wisconsin Division, HDA-WI	(608) 829-7515
John Verhyen	Wisconsin State Patrol	(608) 267-3573

V. COMMERCIAL VEHICLE ITS INFRASTRUCTURE

V. COMMERCIAL VEHICLE ITS INFRASTRUCTURE

The Commercial Vehicle ITS Infrastructure component of the Federal ITS Deployment Program is defined in Section 5209 of the Transportation Equity Act for the 21st Century (TEA-21). It provides Federal ITS funding to deploy Commercial Vehicle Operations (CVO) ITS systems that improve the safety and productivity of commercial vehicles and drivers, and reduce CVO costs and regulatory requirements. A major element of this component is the Commercial Vehicle Information Systems and Networks (CVISN) deployment program. In TEA-21, Congress established a goal to complete CVISN deployment in a majority of states by September 30, 2003.

The Federal Motor Carrier Safety Administration (FMCSA) has adopted a safety goal of reducing the number of deaths and injuries resulting from truck and bus crashes 50 percent by 2010. The CVISN deployment program, managed by the FMCSA, supports the safety goal by providing: (1) State and Federal enforcement officials with electronic access to timely and accurate motor carrier safety and other information to target high-risk carriers for enforcement, and compliance actions and to identify high-risk and/or out-of-service commercial vehicles for further inspection; and (2) the architecture and standards for electronically collecting and exchanging data on motor carrier safety and commercial vehicle operations needed to identify high-risk carriers and vehicles for inspections.

Through CVISN deployment, Federal and State government agencies work together with the motor carrier industry to develop and deploy cost effective information systems and communication networks that provide electronic access to timely and accurate motor carrier safety and other information. CVISN is not a new information system, but connects existing and new information systems, and communication networks that provide a framework for States, the Federal government, and private stakeholders to electronically collect, process and exchange motor carrier safety information and commercial vehicle and driver data. In some cases, this requires only modifications to the existing information systems and communication networks; in other cases, new systems, networks, or applications must be added in order to support the capture, storage, and exchange of information. In either case, increased functionality and capability are the results.

CVISN deployment improves the quality, timeliness, and access to safety information by commercial motor vehicle inspectors that will improve the effectiveness of Federal and State motor carrier safety programs. It also provides more efficient movement for safe and legal carriers on the nation's highways, as Federal and State enforcement personnel have the safety and credentials information to target and focus their enforcement efforts on high-risk operators. CVISN deployment supports more efficient and responsive administrative processes between motor carriers and government agencies. As a result, Federal and State enforcement officials are targeting high-risk motor carriers for enforcement and compliance actions, and identifying high-risk and/or previously un-inspected commercial vehicles and drivers for further inspection. State government agencies are providing more efficient and responsive administrative processes for their motor carrier industry customers. Safe and legal carriers are moving freight more efficiently, as safety enforcement efforts are focused on high-risk carriers, commercial vehicles, and drivers.

A specific set of organizational and technical capabilities associated with CVO-related information systems and communications networks has been identified as CVISN Level 1 capabilities. Level 1 deployment supports:

- **Safety information exchange**, through using the ASPEN software, or its equivalent, to electronically collect and transmit commercial vehicle and driver inspection data at a majority of inspection sites; connecting to the Safety and Fitness Electronic Records (SAFER) system for access to interstate carrier and commercial vehicle data, summaries of past safety performance, and commercial vehicle credentials information; and implementing a State-owned Commercial Vehicle Information Exchange Window (CVIEW) system, or an equivalent system, to exchange intrastate carrier data and commercial vehicle safety and credentials information within the State and connect to SAFER for access to interstate carrier and commercial vehicle data.

- **Interstate credentials administration**, by performing end-to-end processing (i.e., carrier application, jurisdiction application processing, credential issuance) of at least the International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) credentials and be ready to extend to other credentials (e.g., intrastate, titling, oversize/overweight, carrier registration, hazardous materials); connecting to the IRP and IFTA Clearinghouses; handling at least 10 percent of the transaction volume electronically; and being ready to include more carriers and extend to branch offices where applicable.

- **Roadside electronic screening**, through implementing the capability to electronically screen transponder-equipped commercial vehicles implemented at a minimum of one fixed or mobile inspection sites; and being ready to replicate at other sites.

The benefits of deploying technologies that support CVISN Level 1 capabilities are: (1) having more accurate and timely safety and related credentialing information which will improve the effectiveness of Federal and state safety programs; (2) providing more efficient and responsive administrative processes for carriers and government agencies; and (3) promoting more efficient movement for safe and legal carriers as safety enforcement personnel have the safety and credentials information to focus its limited resources on high-risk operators. These activities will result in enhanced safety for drivers, trucks, and buses, and greater operating efficiencies for electronically linked government agencies and motor carriers. In turn, both the public and private sectors will realize savings in time, resources, and the cost of doing business.

The three-step process to deploy CVISN Level 1 capabilities is based on lessons learned from CVISN Prototype and Pilot State Model Deployments, and is outlined below.

- Step 1, Planning. It is expected that a State will complete this step within 15 months, and estimate this step to require a maximum $50,000 of Federal ITS funds. To complete this step, a State will:

  - prepare a Memorandum Of Agreement (MOA) to deploy CVISN Level 1 capabilities in the State that is signed by the major affected State agencies and the motor truck/motor coach associations;

- complete and maintain a current State ITS/CVO business plan that encompasses all ITS/CVO activities; and

- participate in the ITS/CVO technical training courses sponsored by the FMCSA and the FHWA.

- Step 2, Design. It is expected that a State will complete this step within 18 months, and estimate this step to require a maximum of $350,000 of Federal ITS funds. To complete this step, a State will:

  - establish a CVISN project team, including a CVISN project manager and a system architect;

  - participate in a series of CVISN deployment workshops designed to assure conformance with the architecture and interoperability of deployed systems;

  - consider joint uses of transponders and ensure integration among multiple applications, multiple uses of data collected under CVISN deployment, and outreach to motor carriers about other ITS initiatives within the state that could benefit them;

  - complete a CVISN program plan that encompasses all CVISN projects or efforts in the State; and

  - complete a top-level design that describes all planned changes or additions to the systems or products related to CVISN.

- Step 3, Deployment. It is expected that a State will complete this step within 36 months, if it receives full funding for this step. It is estimated that this step will require the use of $2,600,000 of Federal ITS funds. If only partial Federal or State funding is available, States are encouraged to deploy the CVISN Level 1 safety information exchange capabilities first, followed by either credentialing or electronic screening. States are encouraged to leverage other funding sources, as well as use public-private partnerships for CVISN deployment. To complete this step, a State will:

  - incorporate the FMCSA's comments on the CVISN program plan and top-level design;

  - develop a detailed work plan, with milestones, that tie directly to its approved CVISN program plan and submit it to the FMCSA Division and Headquarters office for review and approval;

  - develop and/or modify its systems to implement the design;

  - integrate its systems into a “system of systems” and test to ensure that they work;

- include the CVISN standard interoperability tests as part of the integration and test effort to verify architectural compatibility; and

- follow the ITS/CVO Architecture Conformance Assurance Process.

Deploying CVISN Level 1 capabilities is a major undertaking that may take at least three years. To reduce risk, States are encouraged to use an incremental approach to deployment. It is critical that the deployment project be broken into a series of phases with specific results or products defined for each phase. The use of phases allows taking a large task and breaking it into smaller, manageable pieces. If the first couple of phases are completed on time and meet the objectives, this will provide assurance that the plan is realistic. If not, a State can take corrective action prior to committing extensive resources to a project that is not properly structured for success. Incremental development and measurable milestones ensure stakeholder participation and feedback and provide visibility into the progress of the project.

All states are participating in one of the three steps—Deployment, Design, or Planning—of CVISN deployment. Kentucky, Maryland, Virginia, and Washington completed CVISN deployment, and the states of California and Minnesota are also deploying major CVISN components. Thirty additional states have developed CVISN program plans, and are in various stages of completing deployment. Seven new states completed a fourth round of CVISN deployment workshops in June 2002, and will complete their CVISN program plans and top-level system designs by December 2002. Eight states have developed an Intelligent Transportation Systems/Commercial Vehicle Operations Business Plan, and are ready to participate in future CVISN deployment workshops. Two states have participated in a training course to build awareness of and commitment to CVISN deployment, and are developing their business plans.

Infrastructure Safety Assurance

ROUTE 236/I-495 NORTHERN VIRGINIA INTELLIGENT TRANSPORTATION SYSTEM

Description: This project responds to a number of truck accidents at the Route 236/I-495 interchange. Virginia Department of Transportation will install a truck rollover system patterned on other systems in the National Capital Region which have performed successfully. Other ITS features will also be installed at this interchange.

Project Location: Annandale, Virginia

Partner(s): Virginia DOT

Start Date: October 1998

***End Date*:** February 2007

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $625,000

***Contacts*:**

Tom Jennings	FHWA Virginia Division, HDA-VA	(804) 775-3357
James Robinson	Virginia DOT	(804) 786-6677

Credentials Administration

INTERNET ENABLING OF MOTOR CARRIER REGISTRATION AND INSURANCE FILINGS AND INTERNET ENABLING OF APPORTIONED APPLICATIONS AND RENEWALS

Description: This project is the FY 2000 ITS Integration Program earmark for the Commercial Vehicle ITS Infrastructure Component of the ITS Deployment Program in Texas. In conjunction with the development of the State of Texas' ITS/CVO Business Plan, TxDOT intends to Internet enable motor carrier registration and insurance filings and apportioned International Registration Plan applications and renewals. Internet enabling these motor carrier credentialing processes are part of a larger strategy to develop a "Texas One Stop Shop" for obtaining Texas motor carrier credentials over the Internet.

Project Location: Texas

Partner(s): FHWA, FMCSA, Texas DOT

Start Date: October 2000

***End Date*:** December 2003

Estimated Total ITS Funds: $200,000

Estimated Total Project Cost: $400,000

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Leon Feazell	FMCSA Texas Division	(512) 536-5921
Carol Vinton	Texas DOT	(512) 465-3559
Roland Merz	Texas DOT	(512) 416-3305

Electronic Screening

ELECTRONIC SCREENING/ELECTRONIC TOLL COLLECTION INTEROPERABILITY

Description:

The purpose of this project is to establish regional interoperability of ETC and E-Screening systems using the Fusion transponder. Motor carrier participation in these programs would increase, with resultant cost and safety benefits. Regional interoperability would be a model for national interoperability of Dedicated Short Range Communications applications.

This project builds upon the work of the Intelligent Transportation Society of America's E-Commerce Blue Ribbon Panel advancing toward the same long-term goal along a complementary path. Since regional ETC interoperability already exists through the E-ZPass program, this project is focused on linking regional E-Screening programs to E-ZPass.

Build 1 is already underway as Maryland begins electronic screening operations at the Perryville weigh station on southbound I-95. Fifty Mark IV Fusion transponders have been procured by Maryland DOT and will be installed on MD-based interstate vehicles. These 50 transponder-equipped vehicles will be enrolled into the MD E-Screening and the E-ZPass ETC programs. E-ZPass enrollment is being handled through the Regional Consortium.

The primary objective of Build 2 is to expand ETC/E-Screening interoperability to a large vehicle population.

The Applied Physics Lab will be working with Maryland DOT and the New York State Thruway Authority to equip trucks with transponders that will operate with all toll authorities in the Northeast and with Maryland CVISN sites and also Connecticut CVISN sites. Kentucky may also participate in this test.

ITS funding depicted below is comprised of the following components:

$100,000 - ITS CVO R&D

$225,021 - Maryland FY 2001 Earmark

$580,000 - FY 2001 I-95 Corridor Coalition Funds

Project Location: Maryland, Connecticut, New York, New Jersey

Partner(s): FHWA, FMCSA, Maryland DOT, Maryland Motor Truck Association, Connecticut Department of Motor Vehicles, New York State Thruway Authority, New York State Motor Truck Association, New Jersey Turnpike Authority, New Jersey State Motor Truck Association, Inter-Agency Group, ITS America

Start Date: March 2001

***End Date*:** December 2003

Estimated Total ITS Funds: $905,021

Estimated Total Project Cost:

$3,450,000

Contacts:

Mike Onder	FHWA, Ofc. of Freight Mgt. & Ops.-HOFM	(202) 366-2639
Jeff Secrist	FMCSA, MC-RTT	(202) 358-5658
Joe Foster	Maryland DOT	(410) 856-1097
Eric Christensen	E-Z Pass	(518) 471-4227
Ron Char	JHU/APL	(443) 778-7037

Integrated Systems

CVISN - MODEL DEPLOYMENT (COMMERCIAL VEHICLE INFORMATION SYSTEMS & NETWORKS)

Description:

The model deployment of CVISN is focused on safety information exchange, roadside electronic screening, and credentials administration. Safety Information Exchange provides carrier, vehicle and driver safety information to roadside enforcement personnel and other authorized users. Roadside Electronic Screening provides for screening vehicles that pass a roadside check station, determining whether further inspection or verification of credentials is required, and taking appropriate actions. Vehicle-to-Roadside communications via transponders and readers/writers facilitate the screening functions at mainline speed. Weigh-in-Motion provides for high speed, mainline weighing. Credentials Administration provides for electronic application, processing, fee collection, issuance and distribution of CVO credentials, support of base State agreements, and provides for CVO tax filing/auditing.

Status - The model deployment states have completed their CVISN project plans design, and four states (MD, VA, KY, WA) completed CVISN level one deployment. We expect California and Minnesota to complete deployment by the end of FY 2002 and Colorado, Connecticut, and Michigan to complete deployment by the end of FY 2003.

Project Location: Kentucky, Connecticut, Michigan, Colorado, Minnesota, California, Washington, Oregon

Partner(s): Departments of Transportation and other agencies involved in CVO in participating states

Start Date: October 1996

***End Date*:** September 2003

Estimated Total ITS Funds: $21,100,000

Estimated Total Project Cost: $23,600,000

***Contacts*:**

Doug McKelvey	FMCSA, MC-RTT	(202) 358-5017
Jeff Secrist	FMCSA, MC-RTT	(202) 358-5658

Commercial Vehicle Operations

HAZARDOUS MATERIALS TRANSPORTATION SAFETY AND SECURITY OPERATIONAL TEST

Description:

The purpose of this field operational test (FOT) is to assess the effectiveness of different technologies and procedures and determine the costs and benefits of each to the safety and security of hazardous materials being transported by trucks. The test will independently assess which combination of technology and procedures is the safest and most cost-effective for protecting different types of hazardous cargo from being hijacked by terrorists.

The two-year effort will include 100 trucks equipped with a variety of existing technologies. The project will test capabilities such as biometric driver verification, off-route vehicle alerts, stolen vehicle alerts, cargo tampering alerts and remote vehicle disabling. There are nearly 800,000 daily shipments of hazardous materials on U.S. highways.

The FOT evaluation effort will determine if hazardous materials transportation technology applications selected for testing demonstrated the potential for ensuring the safety and security of the shipment from origin to destination.

The ITS funding figure depicted below includes $1 Million provided by FMCSA. The total funding figure depicted below includes some non cash resources (in kind) provided by various private sector commercial vehicle organizations.

Project Location: Various

Partner(s): Federal Motor Carrier Safety Administration, Federal Highway Administration, Research and Special Programs Administration, USDOT Office of Intermodalism, Battelle Memorial Institute, Commercial Vehicle Safety Alliance, American Transportation Research Institute, Qualcomm, Inc., Total Security Services International, Inc.

Start Date: September 2002

***End Date*:** September 2004

Estimated Total ITS Funds: $2,500,000

Estimated Total Project Cost: $5,000,000

***Contacts*:**

Jeff Loftus	FMCSA, MC-RTT	(202) 358-5651
Joe DeLorenzo	FMCSA, MC-EFM-FV	(708) 283-3572

CVISN LEVEL 1 DEPLOYMENT, STEP 1, PLANNING

Description:

The Commercial Vehicle Information Systems and Networks (CVISN) deployment program organizes commercial vehicle operations (CVO)-related information systems and communication networks owned and operated by federal and state governments, the motor carrier industry, and other stakeholders and enables them to operate in an integrated manner. A specific set of organizational and technical capabilities has been identified for CVISN Level 1 deployment. These capabilities focus on electronically exchanging safety and credentialing information, electronically processing interstate registration and fuel tax credentials, and implementing roadside electronic screening at one fixed or mobile site.

Deploying CVISN Level 1 capabilities is a major undertaking that may require three years. The FMCSA and the FHWA have determined that the estimated cost of CVISN Level 1 deployment is between $6 million and $10 million. This figure was determined through the analysis of the CVISN Project Plans submitted by the pilot states. Since the maximum ITS federal share is 50 percent, the total amount of ITS federal funds was determined to be $3 million per state. Participating states have demonstrated a willingness to contribute additional amounts needed to deploy CVISN Level 1 capabilities.

States are encouraged to use an incremental approach to deployment phased with specific results or products defined for each phase. As a result, three steps have been defined to assist states as they proceed with Level 1 deployment. In step 1, Planning, a state: (1) establishes an ITS/CVO working group; (2) prepares a Memorandum of Agreement to deploy CVISN Level 1 capabilities as funding is available; (3) participates in ITS/CVO technical training courses; and (4) completes and maintains an ITS/CVO Business Plan. It is expected that a state will complete this step in 15 months with a budget of $50,000 of federal ITS deployment funds.

The following states have used federal ITS deployment funds or other federal ITS program funds to complete this step. The cost described at the bottom of this display represents the total amount of federal funds used to support the activities for step 1 as described above.

FY 1999: North Dakota, $50,000; Texas, $50,000

FY 2000: Alabama, $40,000

FY 2001: Vermont, $20,000; New Hampshire, $21,119

FY 2002: Hawaii, $50,000; District of Columbia, $50,000

Project Location: DC, HI, ND, TX, AL, NH, VT

Partner(s): Federal Motor Carrier Safety Administration (FMCSA), North Dakota, Texas, Alabama, New Hampshire, Vermont, private sector trucking firms

Start Date: June 1998

End Date: September 2003

Estimated Total ITS Funds: $140,000

Estimated Total Project Cost:

$140,000

Contacts:

Jeff Secrist	FMCSA, MC-RTT	(202) 358-5658

CVISN LEVEL 1 DEPLOYMENT, STEP 2, DESIGN

Description:

The Commercial Vehicle Information Systems and Networks (CVISN) deployment program organizes commercial vehicle operations (CVO)-related information systems and communication networks owned and operated by federal and state governments, the motor carrier industry, and other stakeholders and enables them to operate in an integrated manner. A specific set of organizational and technical capabilities has been identified for CVISN Level 1 deployment. These capabilities focus on electronically exchanging safety and credentialing information, electronically processing interstate registration and fuel tax credentials, and implementing roadside electronic screening at one fixed or mobile site.

Deploying CVISN Level 1 capabilities is a major undertaking that may require three years. The FMCSA and the FHWA have determined that the estimated cost of CVISN Level 1 deployment is between $6 million and $10 million. This figure was determined through the analysis of the CVISN Project Plans submitted by the pilot states. Since the maximum ITS federal share is 50 percent, the total amount of ITS federal funds was determined to be $3 million per state. Participating states have demonstrated a willingness to contribute additional amounts needed to deploy CVISN Level 1 capabilities.

States are encouraged to use an incremental approach to deployment phased with specific results or products defined for each phase. As a result, three steps have been defined to assist states as they proceed with Level 1 deployment. In step 2, Design, a state: (1) establishes its CVISN project team and selects a CVISN project manager and a system architect; (2) participates in three CVISN deployment workshops; and (3) completes a CVISN Program Plan and Top-Level System Design. It is expected that a state will complete this step in 18 months with a budget of $350,000 of federal ITS deployment funds.

The following states have used federal ITS deployment funds to complete this step. The cost described at the bottom of this display represents the total amount of federal funds used to support the activities for step 2 as described above.

FY 1999:

Alaska, $350,000

Idaho, $350,000

Mississippi, $350,000

Missouri, $350,000

Nevada, $350,000

New Jersey, $350,000

New Mexico, $740,000

New York, $1,730,000

Pennsylvania, $350,000

Utah, $200,000

Wisconsin, $350,000

FY 2000:

Texas, $200,000

FY 2001:

North Dakota, $250,000

Oklahoma, $200,000

FY 2002:

No states received funds to complete Step 2

Project Location: AK, ID, MS, MO, NV, NJ, NM, NY, ND, OK, PA, UT, WI, TX

Partner(s): Federal Motor Carrier Safety Administration (FMCSA), Alaska, Idaho, Mississippi, Missouri, Nevada, New Jersey, New Mexico, New York, North Dakota, Oklahoma, Pennsylvania, Utah, Wisconsin, Texas, private sector trucking firms

Start Date: June 1998

***End Date*:** September 2003

Estimated Total ITS Funds: $5,670,000

Estimated Total Project Cost: $5,670,000

***Contacts*:**

Jeff Secrist	FMCSA, MC-RTT	(202) 358-5658

CVISN LEVEL 1 DEPLOYMENT, STEP 3, DEPLOYMENT

Description:

The Commercial Vehicle Information Systems and Networks (CVISN) deployment program organizes commercial vehicle operations (CVO)-related information systems and communication networks owned and operated by federal and state governments, the motor carrier industry, and other stakeholders and enables them to operate in an integrated manner. A specific set of organizational and technical capabilities has been identified for CVISN Level 1 deployment. These capabilities focus on electronically exchanging safety and credentialing information, electronically processing interstate registration and fuel tax credentials, and implementing roadside electronic screening at one fixed or mobile site.

Deploying CVISN Level 1 capabilities is a major undertaking that may require more than three years. The FMCSA and the FHWA have determined that the estimated cost of CVISN Level 1 deployment is between $6 million and $10 million. This figure was determined through the analysis of the CVISN Project Plans submitted by the pilot states. Since the maximum ITS federal share is 50 percent, the total amount of ITS federal funds was determined to be $3 million per state. Participating states have demonstrated a willingness to contribute additional amounts needed to deploy CVISN Level 1 capabilities.

States are encouraged to use an incremental approach to deployment phased with specific results or products defined for each phase. As a result, three steps have been defined to assist states as they proceed with Level 1 deployment. In step 3, Deployment, a state begins to implement CVISN Level 1 capabilities by: (1) incorporating the FMCSA's comments on its CVISN Program Plan; (2) developing a detailed workplan, with milestones, that tie directly to the Program Plan; (3) developing and/or modifying its information systems and communications networks to implement the design; (4) performing the CVISN standards interoperability tests to verify architectural compatibility; and (5) following the ITS/CVO architecture conformance process. If only partial funding is available for CVISN deployment, states are encouraged to deploy the Level 1 safety information exchange capabilities first, followed by either electronic credentialing or electronic screening. It is expected that a state will complete this step in 36 months with a budget of $2,600,000 of federal ITS deployment funds.

The following states have used federal ITS deployment funds to complete this step. The cost described at the bottom of this display represents the total amount of federal funds used to support the activities for step 3 as described above.

FY 1999:

Maryland, $1,980,000; Minnesota, $1,920,000; Washington, $610,000

FY 2000:

Alaska, $1,850,000; Arizona, $786,000; Colorado, $1,179,000; Idaho, $393,000; Maryland, $900,000; New Mexico, $786,000; Virginia, $2,425,000

FY 2001:

Alaska, $350,000; Connecticut, $2,380,844; Kentucky, $1,190,422; Maryland, $1,830,844; Michigan, $1,500,000; Missouri, $595,211; Nebraska, $650,000; New Mexico, $297,606; North Carolina, $1,190,422; Ohio, $1,587,229; South Carolina, $1,587,229; South Dakota, $992,018; Tennessee, $1,468,176; Texas, $396,807; Utah, $200,000; Virginia, $1,200,000; Wisconsin, $793,615

FY 2002:

Alaska, $494,000 (beyond CVISN-HazMat tracking); Hawaii, $827,000 (beyond CVISN-tracking cargo movement in intermodal terminals); Kentucky, $620,000 (beyond CVISN-develop, install & test vehicle location, automated collision notification, automated brake stroke measurement & engine monitoring technologies on CMVs); Maryland, $452,000 - CVISN deployment; New York, $353,000 - CVISN deployment; Oklahoma, $775,000 -

CVISN deployment; Texas, $275,000 - CVISN deployment; Utah, $25,000 - CVISN deployment; Washington, $207,000 - (beyond CVISN-collect data relevant to freight movement & freight location); Wisconsin, $827,000 - CVISN deployment

Project Location: MD, MN, WA, AK, AZ, CO, ID, NM, VA

Partner(s): Federal Motor Carrier Safety Administration (FMCSA), Maryland, Minnesota, Washington, Alaska, Arizona, Colorado, Idaho, New Mexico, Virginia, private sector trucking firms

Start Date: June 1998

***End Date*:** September 2003

Estimated Total ITS Funds: $12,829,000

Estimated Total Project Cost: $12,829,000

***Contacts*:**

Jeff Secrist	FMCSA, MC-RTT	(202) 358-5658

FMSIB BENCHMARK PROJECT

Description:

This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The setting for the project is the highly congested Washington State I-5 and I-90 corridor region. Commercial vehicle activity in this area suffers from recurring and extensive, congestion-related delays in movement of cargo. The project objective is to collect measurable data relevant to freight movement and freight locations along specified, preplanned freight movement corridors. The project will employ the existing national Commercial Vehicle Information Systems and Networks (CVISN) architecture. Two data collection means will be used: video cameras mounted at key locations to capture commercial vehicle freight movements, and portable automatic vehicle identification (AVI) readers to capture interstate freight movement.

Data collected by video cameras and AVI readers will be analyzed to ensure freight movements are consistent with planned activity and within authorized routes. Live data will be shared in a real-time mode with law enforcement agencies in support of anti-terrorist activities. The integration approach will use existing systems to transfer video data captured by CVISN cameras via AVI readers from roadside to the xCVIEW database whose existing functionality is capable of tracking a transponder-equipped truck between AVI checkpoints. Collection and transmission of data will focus on traffic conditions/collisions, hazards, delays, and information on freight movement route changes.

Project Location: Washington State

Partner(s): FHWA, Washington State DOT, Freight Mobility Strategic Investment Board (FMSIB), Washington State Patrol

Start Date: September 2002

***End Date*:** July 2003

Estimated Total ITS Funds: $206,825

Estimated Total Project Cost: $413,650

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Karen Schmidt	Freight Mobility Strategic Investment Board	(360) 586-9695

Completed Projects

ADVANTAGE CVO

Description:

Advantage CVO, formerly Advantage I-75, represents a multi-state partnership of public and private sector interests along the I-75 corridor. The project facilitated 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 were 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. Four thousand trucks participated in the project. Federal ITS funds ended in September 1997. The participating States are continuing and are proposing to expand to 20,000 trucks.

Project Location:

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

Partner(s):

Florida, Georgia, Tennessee, Kentucky, Ohio, Michigan, Ontario (Canada), Motor Carrier Industry, American Trucking Associations, National Private Truck Council, United Parcel Service, SAIC, Hughes, and University of Kentucky

Start Date:

January 1991

***End Date*:**

August 1998

Estimated Total ITS Funds:

$8,400,000

Estimated Total Project Cost:

$17,532,308

***Contacts*:**

Doug McKelvey	FMCSA, MC-RTT	(202) 358-5017
Joe Crabtree	Kentucky Transportation Center	(606) 257-4513

ASSESSMENT OF STATE BENEFITS AND COSTS FROM ITS/CVO SERVICES

Description: The purpose of this study was to assess the benefits and costs of Intelligent Transportation Systems/Commercial Vehicle Operations (ITS/CVO) technology applications for States nationwide. This project had two distinct phases. Phase 1 consisted of the development of an education tool for Governors that will provide a policy analysis of ITS activities at the Federal level and the implications on transportation systems in their States. Phase 2 consisted of an in-depth economic assessment of the costs and benefits of ITS/CVO technology applications from a State perspective. In addition to this economic assessment, State business plans for the deployment and operation and maintenance of the ITS/CVO applications were also developed. The Governors of the United States, Territories, and Commonwealths of America have worked through the National Governors' Association (NGA) to deal collectively with issues of public policy and governance. The NGA's ongoing mission is to support the work of the Governors by providing a bipartisan forum to help shape and implement national policy and to solve State problems. The Center for Policy Research is the research and development arm of the NGA. The center is a vehicle for sharing knowledge about innovative State activities, exploring the impact of Federal initiatives on State government, and providing technical assistance to States. The center works in a number of policy fields, including economic development, information management, and transportation. The priorities for the NGA's research are set by the Governors.

Project Location: Various

Contractor(s): Iowa DOT and Nevada DOT; Iowa DOT; Nevada DOT

Start Date: September 1995

***End Date*:** July 1997

Estimated Total ITS Funds: $519,859

Estimated Total Project Cost: $519,859

***Contacts*:**

Jeff Loftus	FMCSA, MC-RTT	(202) 358-5651
Thom Rubel	National Governor's Association	(202) 624-7740

AUTOMATED SAFETY ASSESSMENT PROGRAM

Description: The primary objective of the Automated Safety Assessment Program (ASAP) was to obtain data from the motor carrier that will enable the Office of Motor Carriers (OMC) to detect the motor carrier's safety performance without going to the carrier's place of business at a significant cost in time and money. The ASAP program allows motor carriers to present information, through an electronic means, to the OMC regarding their compliance with the Federal Motor Carrier Safety Regulations. The ASAP program consists of menu-driven software that will be provided to eligible motor carriers. The motor carriers would load the software into microcomputer systems and complete a data input process. The data would be downloaded to the Office of Motor Carriers for validation and analysis.

Project Location: Massachusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: May 1995

***End Date*:** October 1998

Estimated Total ITS Funds: $1,500,000

Estimated Total Project Cost: $1,500,000

***Contacts*:**

Ken Rodgers	FMCSA, MC-RTT	(202) 366-4016
Cynthia Mitchell	Volpe Center	(617) 494-2271

AUTOMATED SAFETY ASSESSMENT PROGRAM (ASAP) PILOT ON HAZARDOUS MATERIAL CARRIERS

Description:

Currently, Office of Motor Carriers (OMC) is researching new technology, known as the Automated Safety Assessment Program (ASAP), to allow electronic transmission of data from motor carriers. This technology helped to fill voids present in the Motor Carrier Management Information System (MCMIS), including additional carrier accident information not previously maintained. ASAP enables a motor carrier to submit information electronically to OMC on its compliance with the Federal Motor Carrier Safety Regulations (FMCSRs) and Hazardous Materials Regulations (HMRs).

The ASAP program also speeds the needed receipt of information about new motor carriers. OMC resources focus on carriers that pose the greatest risk on the highway. Studies show that new motor carriers are more likely to be involved in an accident. However, shortages in data relating to new carrier operations critically affect our ability to access these carriers' safety performance. Because OMC relies on MCMIS data to determine risk, the absence of new carrier safety data in MCMIS poses a significant problem.

The Associate Administrator for Motor Carriers requested this pilot study. It assessed the feasibility of ASAP software, as an option to the current Hazardous Materials (HM) permitting program, as an effective means to ascertain whether a HM permit carrier can be authorized to operate in interstate transportation. Congress has supported the development of this program.

Project Location: Cambridge, Massashusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: May 1998

***End Date*:** January 1999

Estimated Total ITS Funds: $1,800,000

Estimated Total Project Cost: $1,800,000

***Contacts*:**

Ken Rodgers	FMCSA, MC-RTT	(202) 366-4016
Dan Hartman	FMCSA, MC-RTT	(202) 366-9579

BLACK BOX DEVELOPMENT

Description: This project was designed to address the feasibility of placing a vehicle incident recorder on commercial vehicles for accident reconstruction. The contractor evaluated which vehicle functions need to be monitored and showed how these functions could be used in accident reconstruction.

Project Location: New Mexico

Contractor(s): Sandia National Laboratory

Start Date: August 1995

***End Date*:** March 1997

Estimated Total ITS Funds: $750,000

Estimated Total Project Cost: $750,000

***Contacts*:**

Kate Hartman	FHWA ITS JPO, HOIT	(202) 366-2742

COMMERCIAL VEHICLE CREDENTIAL SYSTEM ARCHITECTURE

Description:

This study designed a national CVO information system architecture that provides all authorized users on-line access to Registration, Fuel Tax and Safety Information. Further it coordinated numerous national information system development efforts underway in response to congressional legislation and user requirements. This project was an umbrella for the following projects:

1. Commercial Vehicle Fleet Management and Information Systems
2. Systems Planning for Automatic Commercial Vehicle Licensing and Permitting Systems

Project Location: Laurel, Maryland

Contractor(s): Johns Hopkins University's Applied Physics Laboratory

Start Date: February 1994

End Date: September 1995

Estimated Total ITS Funds: $2,660,000

Estimated Total Project Cost: $2,660,000

Contacts:

Mike Onder	FHWA ITS JPO, HOIT	(202) 366-2639
Michael Curtis	FMCSA, MC-RTT	(202) 366-4023

COMMERCIAL VEHICLE FLEET MANAGEMENT AND INFORMATION SYSTEMS

Description: Commercial and public fleet management problems and needs that might be addressed through advanced technologies were identified through case studies and in-depth interviews with fleet managers, dispatchers, and drivers. Phase II studied the application of ITS to intermodal freight movement.

Project Location: Cambridge, Massachusetts

Contractor(s): Cambridge Systematics, Inc.

Start Date: September 1993

***End Date*:** April 1999

Estimated Total ITS Funds: $405,461

Estimated Total Project Cost: $405,461

***Contacts*:**

Gene McHale	FHWA - TFHRC, HRDO-04	(202) 493-3275

COUTTS/SWEET GRASS AUTOMATED BORDER CROSSING PROPOSAL

Description:

This project pursued the development and deployment of ITS applications to expedite the movement of commercial motor carrier traffic back and forth across the U.S./Canadian border at the Coutts/Sweet Grass crossing. The Montana and Alberta jurisdictions involved in the project are pursuing the development and deployment of a "seamless" international border crossing. The resulting technology-based environment is intended to improve on the cooperation, operations and regulatory process which currently exists.

This project is just one of a number of other larger improvement projects which are also proceeding to address the entire border crossing facility. The overall objectives of this initial ITS project were (1) to develop weigh station criteria that are acceptable to both agencies in addressing safety, credential and fuel issues; (2) to establish a database of commercial carriers who agree voluntarily to abide by the developed criteria; (3) to install weigh-in-motion (WIM) systems that assure size and weight compliance among carriers; and (4) to evaluate the success of the system.

Project Location: Coutts, Alberta and Sweetgrass, Montana

Partner(s): Western Transportation Institute, Montana Department of Transportation, Alberta, Canada

Start Date: May 1997

***End Date*:** December 2000

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $625,000

***Contacts*:**

Bob Seliskar	FHWA Montana Division, HDA-MT	(406) 449-5302	Ext. 244
Dennis Hult	Montana DOT	(406) 444-9237	
Steve Albert	Western Transportation Institute	(406) 994-6114	

CVISN - DESIGN OF A COMMERCIAL VEHICLE INFORMATION SYSTEM NETWORK

Description:

FHWA has designed, tested, and evaluated ITS technology to provide automated clearance, electronic credential purchasing, and automated roadside safety information processing for interstate and intrastate Commercial Vehicle Operations (CVO). Currently commercial vehicles are stopped at state borders and checked for size and weight violations. While these are necessary checks, they cause millions of dollars in lost productivity.

An information system is required to allow commercial vehicles to be cleared as they pass at highway speeds. Also, commercial vehicle operators must spend time and effort gathering appropriate credentials (permits) from each state and agency they do business with. Electronic purchasing of credentials and permits would reduce the administrative burden on carriers significantly and help to streamline the states' process of issuing credentials. Additionally, to facilitate the decision process regarding high-risk carriers, the intent is to provide real-time safety data. A national information systems architecture is being designed to support various scenarios. Models of the system have been developed to evaluate those alternatives that best support user services. Subsequently, the system will provide the design for a national CVO information system network. Testing occurred in two (2) prototype states and eight (8) pilot states.

Project Location: Laurel, Maryland

Contractor(s): Johns Hopkins University's Applied Physics Laboratory/RSIS

Start Date: August 1995

***End Date*:** August 1998

Estimated Total ITS Funds: $10,500,000

Estimated Total Project Cost: $10,500,000

***Contacts*:**

Doug McKelvey	FMCSA, MC-RTT	(202) 358-5017
Michael Curtis	FMCSA, MC-RTT	(202) 366-4023

CVISN - PROTOTYPE OF A COMMERCIAL VEHICLE INFORMATION SYSTEM NETWORK

Description: The FHWA designed, tested, and evaluated Intelligent Transportation Systems 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 cause millions of dollars in lost productivity. An information system is required to allow commercial vehicles to be inspected as they pass at highway speeds. A national information system architecture is being designed to support this and other key National CVO information system needs. The national information system architecture was prototyped by this effort.

Project Location: Virginia

Contractor(s): RS Information Systems

Start Date: June 1995

***End Date*:** June 1998

Estimated Total ITS Funds: $3,000,000

Estimated Total Project Cost: $3,000,000

***Contacts*:**

Mike Onder	FHWA ITS JPO, HOIT	(202) 366-6519
Michael Curtis	FMCSA, MC-RTT	(202) 366-4023

DEVELOPMENT, EVALUATION, AND APPLICATION OF BRAKE TESTING DEVICES-BATTELLE MEMORIAL INSTITUTE

Description: The Office of Motor Carriers has contracted with Battelle Memorial Institute to evaluate and test devices that show substantial promise of increasing the efficiency of roadside inspections. Several State inspection/enforcement agencies have tested a variety of brake devices in conjunction with Commercial Vehicle Safety Alliance Level 1 brake inspections on commercial vehicles (heavy trucks and buses). These joint inspections, combined with daily use, training, and maintenance records, provide data from which an objective evaluation of the technologies can be made. The project assessed a variety of technologies including roller dynamometers, flat-plate testers, infra-red detectors, torsional devices, and decelerometers.

Project Location: Ohio, West Virginia, Colorado, Connecticut, Indiana, Oregon, Wisconsin, Nevada, Maryland, and Ontario, Canada

Contractor(s): Battelle Memorial Institute

Start Date: September 1993

***End Date*:** September 1998

Estimated Total ITS Funds: $1,076,264

Estimated Total Project Cost: $3,075,000

***Contacts*:**

Steve Keppler	FMCSA	(202) 366-2978
Dr. Steve Shaffer	Battelle Memorial Institute	(614) 424-4960

DYNAMIC TRUCK SPEED WARNING FOR LONG DOWNGRADES

Description: This project provided 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 for the installation of loops to determine vehicle speed. Using the weight and configuration of the vehicle, the safe descent speed is 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 are advised of the safe speed using variable message signs.

Project Location: Colorado

Partner(s): Colorado DOT, Colorado Motor Carriers Association, and International Road Dynamics

Start Date: June 1993

***End Date*:** January 2000

Estimated Total ITS Funds: $195,000

Estimated Total Project Cost: $243,000

***Contacts*:**

Scott Sands	FHWA Colorado Division, HDA-CO	(303) 969-6730	Ext. 362

ELECTRONIC CLEARANCE FOR INTERNATIONAL BORDERS

Description:

FHWA's Office of Motor Carrier Safety has overseen a coordinated set of operational tests whose purpose is to demonstrate commercial vehicle electronic clearance at international borders including proper identification of Mexican and Canadian motor carriers by using innovative Intelligent Transportation Systems technology. These projects comprised a comprehensive effort designed to support the development of a comprehensive North American system design and standard for international border crossings. The project sites are located at:

* Detroit, Michigan, and Buffalo, New York Crossings (Ambassador Bridge and Peace Bridge)

* Otay Mesa, California Crossing (IBEX)

* Nogales, Arizona Crossing (EPIC)

* Laredo and El Paso, Texas Crossings (TRIBEX)

A key element of these tests is integrating the North American Trade Automation Prototype (NATAP), an initiative of the U.S. Treasury Department.

In addition, while not part of the NATAP, two additional crossings at Blaine, Washington, and Sweetgrass, Montana, were Congressionally directed to be developed for electronic clearance.

All project activity at the border crossings has terminated except at the El Paso-Laredo site (TRIBEX). Activity at this site has transitioned to a demonstration/deployment and is not being evaluated. Final reports for the Buffalo, NY crossing site (Peace Bridge) and the Arizona site (EPIC) have been completed and are available on the JPO EDL. The final evaluation report for the Ambassador Bridge (Detroit, MI-Windsor, Ontario) site was released in June 2000.

Project Location:

The city and states enumerated above.

Partner(s):

Lockheed Martin IMS, HELP Inc., Hughes TMS, PERCEPTICS, Western Highway Institute, Michigan DOT, New York DOT, Arizona DOT, California DOT CalStart, Ontario Ministry of Transportation, Sandia National Laboratory, and JHK

Start Date:

September 1994

***End Date*:**

June 2000

Estimated Total ITS Funds:

$11,640,000

Estimated Total Project Cost:

$19,000,000

***Contacts*:**

Lee Jackson	FHWA, Ofc. of Freight Mgt. & Ops.-HOFM	(202) 366-4415

ELECTRONIC ONE-STOP SHOPPING OPERATIONAL TESTS

Description:

The HELP, Inc., Midwest States, and SW States Electronic One-Stop Shopping Operational Tests are comprised of 14 states. The projects tested different approaches to one-stop, multi-state electronic purchase of credentials from locations such as motor carrier facilities, permitting services, truck stops and state agencies. The carriers were able to purchase registration, fuel tax, authority, and over-dimensional permits from participating states through the systems. Credentials could be delivered electronically to the requesting location or to a location specified by the carrier. The carriers would electronically request and pay for credentials through their base state or individual states. The primary objective of these tests was to evaluate improvements in state and motor carrier productivity from a one-stop electronic system which will make it possible for a motor carrier to apply for, pay for, and receive all necessary credentials or permits electronically either from the base or individual states.

Project Location:

HELP Inc.: CA, AZ, NM; Midwest: IA, MN, NE, WI, KS, MO, IL, SD; Southwest: CO, NM, AR, TX

Partner(s):

Various, HELP Inc, State Agencies in participating states, Lockheed-Martin, In-Motion, RSIS; 50 private motor carriers

Start Date:

January 1995

***End Date*:**

September 1997

Estimated Total ITS Funds:

$4,525,937

Estimated Total Project Cost:

$7,874,856

***Contacts*:**

Jeff Loftus	FMCSA, MC-RTT	(202) 358-5651

INTER-REGIONAL INSTITUTIONAL STUDY PROJECT

Description: This study contributed to the establishment of uniformity in truck weights enforcement and the creation of a uniform, single registration form for all port reporting states.

Project Location: Georgia

Contractor(s): Georgia DOT

Start Date: September 1994

***End Date*:** December 1998

Estimated Total ITS Funds: $575,000

Estimated Total Project Cost: $1,150,000

***Contacts*:**

Jeff Loftus	FMCSA, MC-RTT	(202) 358-5651
Glennon Musial	FMCSA, MC-RTT-GA	(404) 347-4049

ITS/CVO COMMUNICATIONS-OUTREACH PLAN

Description:

The ITS/CVO Communications-Outreach Plan designed and oversaw development and production of the necessary communications tools to assure that the ITS/CVO program is fully communicated to selected audiences. Major areas of emphasis included:

I. Communications
- -- Product dissemination plan
- -- ITS/CVO promotional, educational and presentation materials
- -- Bi-lingual education, presentation materials
- -- Portable ITS/CVO exhibit displays
- -- National Listening Session
- -- Media Relations strategy and campaign
- -- National database for ITS/CVO technology information

II. Outreach
- -- National Focus Groups Meetings
- -- ITS/CVO Training Course

Additionally, the Coordinator planned, and oversaw development of a variety of outreach activities designed to educate and inform selected audiences while gaining support and participation in the ITS/CVO program.

Project Location: Various

Partner(s): DRI - Walcoff & Associates, Transportation Safety Institute, and CVSA

Start Date: September 1995

***End Date*:** September 1996

Estimated Total ITS Funds: $380,000

Estimated Total Project Cost: $380,000

***Contacts*:**

Zeborah English	FMCSA, MC-RTT	(202) 358-5671

ITS/CVO GREENLIGHT PROJECT

Description:

The Oregon ITS/CVO Green Light Project improves the safety and efficiency of commercial vehicle operations and increases the performance of the highway system. The project electronically verified safety and weight information of drivers, vehicles, and carriers from fixed and mobile roadside sites at highway speeds. The Green Light project is interoperable with the HELP, Inc. and ADVANTAGE CVO electronic clearance efforts to form the national deployment of an electronic information network for commercial vehicles and States.

The primary features of this effort were to:

* Deploy mainline electronic pre-clearance sites;
* Deploy integrated tactical enforcement sites;
* Create safety enhancements including electronic access to driver/vehicle/carrier safety status, downhill speed control notification systems, and road/weather conditions;
* Integrate vision technology for vehicles not equipped with transponders
* Provide hardware/software upgrades and database management and development to support the project; and
* Perform an independent objective evaluation of the project.

Project Location: Oregon

Partner(s): Oregon DOT and Oregon State University; Iowa State University; Walton & Associates

Start Date: March 1995

***End Date*:** August 2001

Estimated Total ITS Funds: $20,000,000

Estimated Total Project Cost: $25,500,000

***Contacts*:**

Jeff Loftus	FMCSA, MC-RTT	(202) 358-5651
Mike Nolan	FMCSA, MC-EFW-OR	(503) 399-5775

ITS/CVO LEGAL & PRIVACY STUDY

Description: This cooperative agreement initiated a literature review and contacted various members of the ITS/CVO community, industry representatives, transportation experts and legal/privacy act experts to identify key issues relating to ITS/CVO.

Project Location: Durham, North Carolina

Contractor(s): North Carolina Central University

Start Date: October 1996

***End Date*:** January 1998

Estimated Total ITS Funds: $77,000

Estimated Total Project Cost: $77,000

***Contacts*:**

Kate Hartman	FHWA ITS JPO, HOIT	(202) 366-2742
Dean Percy Luney, Jr.	North Carolina Central Univ. School of Law	(919) 560-6427

MODIFICATIONS TO SAFETYNET

Description: This project involved the reprogramming of existing SAFETYNET System enabling the application of the Volpe National Transportation Systems Center Safety Fitness rating process making intrastate carrier data available at 100 MCSAP sites.

Project Location: Rockville, Maryland

Contractor(s): Farradyne Systems, Inc.

Start Date: October 1994

***End Date*:** December 1999

Estimated Total ITS Funds: $1,249,513

Estimated Total Project Cost: $2,449,975

***Contacts*:**

Angeli Sebastian	FMCSA, MC-RTT	(202) 366-0071

NATIONAL INSTITUTE FOR ENVIRONMENTAL RENEWAL (NIER)

Description:

This project was designed to demonstrate the feasibility of utilizing computerized emergency response information, including telecommunications technologies, to provide hazardous materials information to emergency response units.

Phase I objectives were to:

- Identify contents of shipments of hazardous materials transported by motor carriers, and
- Link systems that identify, store and allow retrieval of data for emergency response to incidents and accidents involving transportation of hazardous materials by motor carriers either directly or through links with other systems.

Phase I was completed.

During Phase II, the project was expanded to include the OPERATION RESPOND System and intermodal movements at the Port of Los Angeles.

Before NIER could test a prototype commercial vehicle and hazardous materials tracking system, a more capable system became commercially available. NIER was in the process of reviewing/revising its system development approach to account for commercially available technologies when it went into receivership and the project was terminated. No final report will be delivered.

Project Location: Phase I, Mayfield, Pennsylvania: Phase II, Port of Los Angeles, California

Partner(s): NIER and various subcontractors

Start Date: September 1996

***End Date*:** March 2001

Estimated Total ITS Funds: $4,000,000

Estimated Total Project Cost: $4,000,000

***Contacts*:**

Lee Jackson	FHWA, Ofc. of Freight Mgt. & Ops.-HOFM	(202) 366-4415
Robert Ketenheim	FMCSA	(410) 962-0098

ON-BOARD BRAKE RESEARCH AND TESTING

Description: FHWA and NHTSA have entered into a reimbursable agreement to develop and evaluate prototype electronic braking systems. These systems potentially offer many advantages compared to pneumatically-controlled systems in terms of reliability, safety, efficiency, and productivity. This multi-year effort developed functional and performance specifications for electronic braking systems that will enable them to act as status monitors and recorders.

Project Location: Winston-Salem, North Carolina

Contractor(s): Various vehicle/electronic manufacturers

Start Date: October 1995

***End Date*:** September 1998

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Steve Keppler	FMCSA	(202) 366-2978

ON-BOARD DRIVER MONITORING/FITNESS-FOR-DUTY TESTING

Description: This pilot test evaluated the ability of a lane tracking device to monitor a driver's fitness-for-duty. Drivers using this device establish a "base" for their ability to keep a vehicle in its lane. If deviation is detected, the driver is notified. If it continues, both the driver and the carrier are notified. The driver then stops the vehicle at the closest safe location and takes a five minute test. Depending on the test results, the driver may continue driving or may be required to sleep before resuming driving responsibilities.

Project Location: San Diego, California

Contractor(s): Trucking Research Institution; Trucking Research Institute and Evaluation Systems, Inc.

Start Date: June 1995

***End Date*:** October 1998

Estimated Total ITS Funds: $628,000

Estimated Total Project Cost: $628,000

***Contacts*:**

Kate Hartman	FHWA ITS JPO, HOIT	(202) 366-2742
Bill Rogers	Trucking Research Institute	(703) 838-7912

OPERATION RESPOND

Description:

This project was designed to provide an electronic link with 911 operators and participating carriers during the initial response to hazardous materials accidents. The project is currently being expanded to establish computerized information systems for emergency responders and participating railroads and motor carriers serving Mexican and Canadian border crossings. The crucial information provided by this innovative system enabled emergency responders to have real-time access to hazardous materials information on the scene across North America to facilitate assessment of situations and to determine appropriate immediate action. This further ensures the safety of the public and emergency personnel.

Project Location:

Houston, Texas; Atlanta, Georgia; New Orleans, Louisiana Nuevo Laredo, Mexico; Laredo, Texas; Contra Costa County, California; Buffalo, New York; Niagara Falls, Detroit, Michigan; Canada and other locations to be determined.

Partner(s):

Operation Respond Institute, Inc.

Start Date:

January 1997

***End Date*:**

March 2000

Estimated Total ITS Funds:

$1,540,000

Estimated Total Project Cost:

$3,015,000

***Contacts*:**

Lee Jackson	FHWA, Ofc. of Freight Mgt. & Ops.-HOFM	(202) 366-4415

OUT-OF-SERVICE VERIFICATION OPERATIONAL TESTS

Description: Two operational tests were conducted that utilized technologies that provide automatic, real-time out-of-service verification at the roadside. The Wisconsin/Minnesota project utilized video identification equipment and a database which would be created containing key out-of-service data on specific vehicles. Subsequent downstream identification of vehicles determined whether or not a vehicle is in violation of an out-of-service order. The Idaho project utilized AVI tags, video imaging analysis and an inspection site alarm system that would be activated when an out-of-service vehicle attempts to leave. The Minnesota/Wisconsin test was completed in March 1999. The Idaho test report was completed in May 2000.

Project Location: Minnesota/Wisconsin and Idaho

Partner(s): Minnesota Department of Public Safety, Minnesota DOT, Wisconsin DOT, Wisconsin Division of State Patrol, Idaho Department of Law Enforcement, Idaho National Energy Laboratory, Hughes Missile Systems Company

Start Date: April 1994

***End Date*:** March 2000

Estimated Total ITS Funds: $1,016,000

Estimated Total Project Cost: $1,400,000

***Contacts*:**

Steve Keppler	FMCSA, MC-RTT	(202) 366-2978
Lt. Tim Carnahan	Wisconsin State Patrol	(608) 266-0264
Saundra DeClotz	Idaho State Police	(208) 884-7220

PASS

Description: PASS (Port-of-Entry Advanced Sorting System) was a test of mainline sorting at Oregon's Ashland Port-of-Entry on northbound I-5. The project examined integrating Automatic Vehicle Identification (AVI), Weigh In Motion (WIM) and Automated Vehicle Classifications (AVC) 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 were 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.

Project Location: Ashland Port of Entry, Northbound I-5

Partner(s): Oregon DOT and Motor Carrier Industry

Start Date: July 1992

***End Date*:** December 1996

Estimated Total ITS Funds: $350,000

Estimated Total Project Cost: $552,000

***Contacts*:**

Mike Nolan	FMCSA, MC-EFW-OR	(503) 399-5775	Ext. 325
Milan Krukar	Oregon DOT	(503) 378-4082	
Ken Everet	Oregon DOT	(503) 378-6054	

ROADSIDE MCSAP COMPUTER SYSTEM (200 SITES)

Description:

This Congressionally mandated project had the goal of providing by December 31, 1995, carrier safety data and driver license status to the roadside for at least 100 MCSAP inspection sites; and by mid-1997, the additional capability to access this data electronically via communications from at least 200 MCSAP sites. This project uses information systems technology to better target inspections, improve driver license checks, and provide for electronic recording and uploading of inspection data via portable computers.

The project encompasses the following projects:

* Development of a functional vehicle driver inspection system (ASPEN),
* Evolution of roadside data communications options (SAFER),
* Development of Inspection Selection System (ISS).

Status - A first generation ASPEN inspection system (for DOS) was deployed in 1995 in 25 States. It was replaced in 1996 by a second generation ASPEN written for Windows. This version currently is deployed in 45 States and is in use by approximately 2,000 law enforcement officers. The pen-computer strategy has given way to a laptop computer strategy because of limitations in pen-computer hardware technology. Widespread use of ASPEN greatly has improved inspection accuracy, inspection report readability, and timeliness of data transfer into the National information system. A third generation rebuild of ASPEN into a 32-bit system for WindowsNT is slated for 1998.

The Inspection Selection System (ISS) was developed and deployed in 45 States with great success. Societal benefits have been calculated to exceed $60 million per year (see final ISS report). A version of ISS for voice input has been developed and is being tested. To tie ISS closely with OMC's SAFESTAT carrier prioritization algorithm, a second generation ISS, based closely on SAFESTAT, currently is under development.

The SAFER communications system is a many-faceted project and is still under development. Currently, functional parts include:

* Inspection transfer via a data mailbox system,
* Unknown carrier name & address and "snapshot" lookup,
* Weekly refresh of local ISS carrier snapshot databases.
* Carrier information availability via the Internet

The next major addition to SAFER was implementation of a 30-day past inspection database, and query retrieval system. This was expected to be operational by Summer 1998 with release of ASPEN version 1.4.

Widespread deployment of SAFER to State users has proved to be more complex than originally anticipated. As of January 1998, SAFER use was limited to beta testing with about 30 users in three States (CT, DE, NY).

Project Location:

45 States

Partner(s):

45 States, MCSAP Funds

Start Date: September 1995

***End Date*:** January 1998

Estimated Total ITS Funds: $2,000,000

Estimated Total Project Cost: $3,600,000

Contacts:

Pat Savage	FMCSA, MC-RIS	(202) 366-0077

SAFETY AND FITNESS ELECTRONIC RECORDS SYSTEM (SAFER)

Description: SAFER system provides electronic records of carrier safety fitness to ITS/CVO and enables carrier safety fitness data to be accessed by roadside inspectors at 100 MCSAP sites.

Project Location: Baltimore, Maryland

Contractor(s): Johns Hopkins University's Applied Physics Laboratory

Start Date: January 1994

***End Date*:** June 1998

Estimated Total ITS Funds: $5,850,000

Estimated Total Project Cost: $5,850,000

***Contacts*:**

Pat Savage	FMCSA, MC-RIS	(202) 366-0077

SMART CARD DEVELOPMENT

Description: The smart card project developed three smart card prototypes: 1.) Smart CDL, 2.) Smart Cargo Manifest, and 3.) Smart Vehicle Card. These cards were developed and tested to determine what type or combination of types (i.e., bar code, magnetic stripe, computer chip) of technology these cards should employ in order to provide real-time safety data and reduce the paperwork burden for the carrier(s) and driver(s).

Project Location: Woodbridge, Virginia

Contractor(s): 3-G International

Start Date: September 1995

***End Date*:** December 1996

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,000,000

***Contacts*:**

Kate Hartman	FHWA ITS JPO, HOIT	(202) 366-2742

SYSTEMS PLANNING FOR AUTOMATED COMMERCIAL VEHICLE LICENSING AND PERMITTING SYSTEMS

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

Project Location: Cambridge, Massachussettes

Contractor(s): Cambridge Systematics, Inc.

Start Date: June 1992

***End Date*:** February 1997

Estimated Total ITS Funds: $618,000

Estimated Total Project Cost: $625,000

***Contacts*:**

Michael Freitas	FHWA ITS JPO, HOIT	(202) 366-9292

VI. INTERMODAL FREIGHT

VI. INTERMODAL FREIGHT

To maximize the capacity of the nation's transportation infrastructure, it is important to plan and manage transportation assets as a single intermodal system. This is especially vital given the rapid growth of the intermodal freight business. Between 1985 and 1995, the number of intermodal containers moving through ports worldwide doubled. In the next two decades, the volume of marine trade is expected to triple. Intermodal freight moved by truck has grown comparably with the increase in volumes via maritime, air, and rail modes, and is expected to keep pace. These increased volumes of intermodal freight movement will have a severe impact on the nation's highways, rail lines, waterways, and ports of entry.

Advanced information and communications technologies applied across the intermodal system offer important opportunities to strengthen the links between the separate modal systems, which are currently run as competing options with minimal cooperation between one another. U.S. DOT's Intermodal Freight Program is laying the groundwork to utilize ITS technology to help both the public and private sectors bridge the modal interfaces in the Nation, and at the borders with Canada and Mexico. The end goal of the Intermodal Freight Program is to provide safer, more reliable, and more efficient intermodal freight mobility over the Nation's surface and maritime infrastructure. Better mobility will benefit both metropolitan communities and the freight community, while also contributing to U.S. DOT's strategic goals of mitigating congestion, enhancing economic performance, and ensuring national security.

In support of the Intermodal Freight Program's goal to facilitate goods movements across our borders, FHWA's International Border Clearance program is providing an important link to trading partners in the North and South. In 1997 and 1998, FHWA conducted field operational tests at seven sites – five on the Northern border and two on the Southern border. The purpose of these tests was to examine the feasibility of using ITS technology to expedite the processing of safety information at international border crossings. These tests were carried out in cooperation with the U.S. Department of the Treasury, U.S. Customs Service, the Immigration and Naturalization Service, and our Canadian and Mexican partners.

Under TEA-21, intermodal freight research will be advanced by applying the technology and lessons learned from ITS operational tests and the metropolitan and Commercial Vehicle Information Systems and Networks (CVISN) model deployments. The hallmark of the ITS Program is linking "stove piped" legacy information systems together to benefit the community at large. Linking information systems between the modes to provide an end-to-end information flow is expected to enhance and make more efficient the movement of freight through highly congested areas.

U. S. DOT believes that sharing information through systems linked by Electronic Data Interchange (EDI) standards can facilitate movements of intermodal freight by identifying and bypassing transportation bottlenecks at ports and on highways and eliminating stops for vehicle and cargo documentation that increase operating costs and contribute to congestion. This belief has been substantiated by input from the intermodal freight community. Over the past several years, U.S. DOT has sponsored numerous studies, conferences, and outreach initiatives on

intermodal issues. A consistent message has been that a transportation system's physical infrastructure must effectively be complemented by a data communications infrastructure if the system is to operate at its highest potential. Whether for transportation movements in general, or intermodal movements in particular, real-time data communications gives transportation managers and vehicle drivers a chance to quickly respond to system delays or new demands.

During fiscal years 1999 and 2000, FHWA conducted two field operational tests in cooperation with the U.S. Customs Service to expedite the processing of U.S. DOT safety clearance concurrent with Customs' clearance through the National Customs Automation Program. The tests took place at the Ambassador Bridge in Detroit, Michigan, and the Columbia-Solidarity Bridge in Laredo, Texas. Further, the Corridor and Borders Program, established by TEA-21, is providing the opportunity to further deploy ITS applications to borders and corridors to expedite freight flows.

FHWA also is participating in border and corridor activities with the North American Free Trade Agreement (NAFTA) Land Transportation Standards Subcommittee and the Transportation Consultative Group on Science and Technology to conduct joint technology tests at border crossings. The objective is to develop technological standards that facilitate transportation and trade, and that are interoperable throughout North America.

In addition during fiscal years 1999 through 2003, FHWA is conducting two intermodal freight operational tests. The first test, based in Chicago, includes the development of a secured multimodal electronic cargo manifest, allowing for the automated transfer of comprehensive cargo data across transportation modes and political jurisdictions. The primary objective of the test is to enhance operational efficiency for freight shippers and operators, while ensuring cargo safety and security for the public good. It involves biometric smart card technologies to ensure system integrity and security. The system also utilizes an internet-based electronic manifest. Lastly, the project is being installed and beta-tested in Chicago's O'Hare Airport using approximately 10 manufacturers, 10-15 trucking companies, and 5-10 air cargo carriers and receivers recruited by SecurCom and the American Trucking Associations (ATA) Foundation. After the beta-test is successfully completed, a second airport and supply chain will be added at Newark, New Jersey.

The second test, based in Seattle Washington, provides the opportunity to integrate ITS/EDI initiatives of transportation agencies and the intermodal freight industry in vehicle tracking, electronic clearance, traveler information, pick-up and delivery scheduling, incident management, and HAZMAT monitoring. The main objective of the test is to allow freight information to flow in advance of the physical movement of freight, and for this information to arrive at every checkpoint along the way in advance of the truck conveyance.

The Intermodal Freight Program will work to mitigate current congestion problems caused by intermodal freight demands upon the transportation system, while meeting the challenge of expected increased future traffic volumes. In 2003, additional operational tests will be conducted. Two of these new initiatives evaluate technologies applied to terminal dray operations, cargo visibility operations, and freight security using electronic container seals.

Intermodal Freight

AN INTEGRATED CARGO INFORMATION & SECURITY SYSTEM FOR INTERMODAL DISTRIBUTION CHANNELS

Description: The American Trucking Associations (ATA) Foundation's test builds upon a recently completed pilot study that evaluated the use of biometric identifiers in expediting security clearances for truck-air cargo transfers at Chicago O'Hare International Airport. This test will augment the biometric identifiers with electronic manifests to facilitate gate processing and security checks in a longer segment of the logistics chain that extends from the manufacturer/distributer, through surface/air carriers, to consignees.

Project Location: Chicago, Illinois

Partner(s): ATA Foundation, O'Hare International Airport

Start Date: September 1999

***End Date*:** January 2003

Estimated Total ITS Funds: $698,805

Estimated Total Project Cost: $1,328,805

***Contacts*:**

Lee Jackson	FHWA, Ofc. of Freight Mgt. & Ops.-HOFM	(202) 366-4415

ASSET AND CARGO VISIBILITY & FREIGHT INFORMATION HIGHWAY

Description:

The asset and cargo visibility test expects to improve the productivity of container and chassis usage by monitoring their movement between freight terminals and customers, to improve the staging of both assets to have them available when needed, and to provide immediate maintenance information to motor carriers to reduce movements of unsafe chassis.

The freight information highway test expects to provide freight asset and cargo information in a standard format to ocean carriers, railroads, motor carriers (dray and over the road), and ports and terminals through an open architecture backbone information system. This test will also support the asset and cargo visibility test and the terminal dray operations test. American Presidents Line will lead this test, and Union Pacfic and Transcentric will focus on the freight information highway.

Project Location: Oakland, CA; Chicago, IL

Partner(s): FHWA, American Presidents Line, Union Pacific, PAR Government Systems, Transcentric, Inc.

Start Date: October 2001

***End Date*:** April 2003

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $2,000,000

***Contacts*:**

Lee Jackson	FHWA, Ofc. of Freight Mgt. & Ops.-HOFM	(202) 366-4415

CARGO*MATE LOGISTICS INFORMATION MANAGEMENT SYSTEM (LIMS) ITS DEPLOYMENT PROGRAM

Description:

This project is a component of the States of New Jersey and New York FY 2000 Earmark. The objective of this project is to migrate and deploy an enhanced Cargo*Mate Logistics Information Management System which tracks intermodal assets at tenant facilities and port terminals in the Port of New York and New Jersey. The system will interface directly with infrastructure elements managing freight, providing traveler information and emergency information. The project was extended and accelerated by the FY 2001 ITS Integration Program earmark for the Port Authority of New York and New Jersey. Activities initated under the first earmark resulted in deployment of 250 Cargo*Mate Chassis Tracking Systems, 200 on over-the-road chassis and 50 on rail chassis. The system obtains location and status data from sensors affixed to intermodal chassis, fuses the data at Cargo*Mate Operations Center and translates these data into useful business information provided to customers over the Internet. The FY 01 earmark extends the operational concept by providing interfaces between Cargo*Mate and the PA NY/NJ's Freight Information Real-time System for Transport and the Operation Respond Emergency Information System to ensure ITS program benefits in both the private and public sector.

The project has been subsequently expanded and extended by FY 2002 ITS Integration Program earmarked funding. FY 2002 funding will support enhancement of Cargo*Mate to provide container and cargo security through the addition of RF energy ID tags, and readers/signposts that will provide container identification and seal security, as well as highly accurate position information for Hazmat cargo and high value cargo. The enhanced Cargo*Mate will have the capability of providing accurate location data enabling first responders to improve incident management. The enhanced Cargo*Mate will have the capability of providing accurate location data enabling first responders to improve incident management. The enhanced Cargo*Mate system will function as an off-the-shelf communications platform to track intermodal chassis, and enable real-time communications with and reading of in-transit containers that will be deployed and demonstrated from port terminals and facilities in and around the Port of New York and New Jersey; Oakland, CA; Houston, TX; New Orleans, LA; Long Beach, CT; Seattle, WA; Memphis, TN; and Chicago, IL.

Project Location: Port of New York and New Jersey

Partner(s): TRANSCOM, Port Authority of New York and New Jersey, PAR Logistics Management Systems, Operation Respond Institute

Start Date: September 2000

End Date: February 2004

Estimated Total ITS Funds: $3,202,692

Estimated Total Project Cost:

$6,438,994

Contacts:

Lee Jackson	FHWA, Ofc. of Freight Mgt. & Ops.- HOFM	(202) 366-4415	
Keith Sinclair	FHWA New Jersey Division, HTC-NJ	(609) 637-4204	
Brian Bluff	PAR Logistics Mgmnt. Sys.	(315) 738-6000	Ext. 213
John Mohler	PAR Logistics Mgmnt. Sys.	(703) 567-5103	
Greg Talomie	PAR Logistics Mgmnt. Sys.	(315) 738-0600	Ext. 269

DEPLOYMENT OF ITS TECHNOLOGY TO FACILITATE MOVEMENTS OF INTERMODAL FREIGHT

Description: The Washington State test will tag 10,000 intermodal containers and trailers with disposable electronic seals which will contain manifest information, gate release/arrival times, route plans, and other information that will allow the container/trailer to be used as a traffic probe for freight planning purposes. This test element will also be augmented with real-time, Internet and radio-based traffic updates from existing ITS traveler information systems, and video cameras at port gates will report on queueing situations.

Project Location: Washington State

Partner(s): Sea-Land, Port of Tacoma, Washington Trucking Association, Puget Sound Regional Council

Start Date: September 1999

***End Date*:** January 2003

Estimated Total ITS Funds: $1,032,500

Estimated Total Project Cost: $1,381,500

***Contacts*:**

Chip Wood	OST, S-3	(202) 366-5911

TERMINAL DRAY OPERATIONS

Description: The terminal dray operations test expects to improve cross-town movements of freight in Chicago. Current cross-town moves can take from 3 to 5 days. Container data will be forwarded through standard message sets from a marine terminal on the West Coast to freight terminals in Chicago. As trains are loaded at the Port of Tacoma (Washington State), the information will be shared with terminal and drayage operations in Chicago. Commercial vehicles will be staged to pick up containers as soon as they are grounded and move them to another rail line or to an end destination customer.

Project Location: Chicago, Illinois

Partner(s): American Trucking Associations Foundation, Port of Tacoma, WA; Chicago Area Transportation Studies (CATS); Union Pacific

Start Date: October 2001

***End Date*:** January 2003

Estimated Total ITS Funds: $85,000

Estimated Total Project Cost: $175,000

***Contacts*:**

Michael Onder	FHWA, Ofc. of Freight Mgt. & Ops.-HOFM	(202) 366-2639

VII. INTELLIGENT VEHICLE INITIATIVE (IVI)

VII. INTELLIGENT VEHICLE INITIATIVE (IVI)

The Intelligent Vehicle Initiative's (IVI) primary focus is in support of the U.S. Department of Transportation (U.S. DOT) and Federal Highway Administration (FHWA) goals of improving safety. This program will increase traffic safety by expediting the commercial availability of advanced vehicle control and safety systems, which may be augmented by interaction with the infrastructure. Secondarily, the program will seek to support the goals of improving mobility and productivity.

Over the last several decades, safety equipment in the vehicle such as seatbelts and airbags, improved highway design, and anti-drinking-and-driving campaigns have led to major improvements in protecting people and improving overall safety. However, more than 6.4 million motor vehicle crashes continue to occur on our highways every year, causing approximately 5.2 million injuries and more than 41,000 fatalities, and costing more than $150 billion per year. Driver error is cited as the primary cause in about 90 percent of all police-reported crashes involving passenger vehicles, trucks and buses. U.S. DOT analysis shows that the widespread deployment of advanced driver assistance systems will significantly reduce the annual number of motor vehicle crashes.

Four of U. S. DOT's agencies (Federal Highway Administration, Federal Motor Carrier Safety Administration, Federal Transit Administration, and National Highway Traffic Safety Administration) have partnered with other public and private organizations under the ITS program to conduct the Intelligent Vehicle Initiative. Through the IVI, U.S. DOT aims to reduce the number of crashes caused by driver error.

In order to achieve this, U.S. DOT has a two-part role. The first is to ensure that safety is not compromised by the introduction of in-vehicle systems. A particular interest for the IVI is the safety impacts of combining multiple systems, such as route guidance and navigation, adaptive cruise control, cellular telephones, and in-vehicle computers. We are investigating the impact that these systems may have on driver behavior by measuring any changes in the level of driver workload and distraction.

The second part of the Federal role in IVI addresses our responsibility for reducing deaths, injuries and economic losses resulting from motor vehicle crashes. This role, which is a cornerstone of U.S. DOT's mission, is being carried out by facilitating the development, deployment, and evaluation of driver-assistance safety products and systems.

Human factors and how they relate to driver performance are fundamental underpinnings of the IVI program. Human factors studies are integrated with other types of studies, such as sensor performance, to create the systems approach to vehicle-based safety improvements. The importance of the human factors studies is due in large measure to the fact that the IVI program is charged with helping to find human-centered solutions to the human-centered problem of highway crashes, and the resulting deaths and injuries.

The IVI is a problem-based program. An analysis of crash statistics and causal factors resulted in the selection of problem areas of high potential payoff in safety. The solution to these problems will help drivers in three types of situations:

- Normal Driving – The first problem area addressed is to design in-vehicle information systems (navigation, cellular phones, in-vehicle computers) that can be operated safely under normal driving conditions.

- Degraded Conditions – The second area is to assist drivers in conditions where the risk of crash is increased. These include conditions where the environment is degraded, such as reduced visibility or inclement weather or where the driver's condition is reduced by drowsiness.

- Imminent Crash Situations – The third area is to intervene in situations where a crash will occur unless the system provides specific advice or assumes partial control of the vehicle.

NORMAL DRIVING

In this situation our primary objective is to ensure that safety is not compromised by the introduction of in-vehicle systems. The underlying concept is that crashes may occur if the system encourages dangerous driving behavior. This dangerous behavior can take the form of driver distraction, driver inattention or recognition error. Thus, IVI research seeks to determine if there are changes in driving behavior, and addresses a research question asking, "would this change cause a crash in certain driving environments, and would the driver choose to use the system and exhibit this behavior in a situation that would produce a crash?"

When practiced in a protected environment, each behavior may have no effect on the safety of driving; however, when these behaviors occur in inappropriate driving environments, crashes can occur. IVI research activities on the implications of in-vehicle technologies on driver behavior are designed to:

- Improve understanding of the nature and extent of the safety problem.
- Develop and apply methods to assess the effects of technology and driver characteristics on driving performance.
- Develop human factors guidelines to aid in equipment design.
- Develop integrated approaches to reduce distraction from in-vehicle devices.

DEGRADED CONDITIONS

The analysis of the factors that cause crashes identifies a category of IVI systems that enhance driver performance under degraded conditions. Conditions in the environment may be weather-related such as icy roads or related to roadway design such as tight curves. The driver's own physical condition may be degraded by fatigue. The underlying concept is that a crash may occur if the system does not intervene with timely and effective advice. In effect, the system is improving the driver's understanding of the driving environment and the driver's own physical condition. Within this area U.S. DOT is working on Driver Condition Monitoring (driver fatigue is a factor in 3 to 6 percent of fatal crashes involving large trucks; fatigue is a factor in 18 percent of single-vehicle, large truck fatal crashes); Vision Enhancement (a significant factor in 42 percent of all vehicle crashes and additional pedestrian collisions); and Vehicle Stability (50 percent of large truck driver fatalities occur in trucks that rolled over). Future IVI activities will also identify performance capabilities of special driver populations that include older drivers, younger drivers and disabled drivers. This will link crash experiences with apparent deficiencies, and identify countermeasures that may meet the special needs of these drivers for assistance in crash avoidance.

IMMINENT CRASH SITUATION

Systems that are effective in this situation work in the final moments before an impending crash. The underlying concept is that a crash will occur if the system does not intervene with timely and effective advice or control of the vehicle. The IVI Program has analyzed data regarding causal factors contributing to crashes; performed case studies and other research to develop a statistical view of these factors, and identified promising approaches for preventing these crashes. The four crash type prevention approaches that were identified in this process are: rear-end collision avoidance (approx. 1.7 million police-reported light vehicle crashes/year); road departure crash avoidance (approx. 1.2 million police-reported crashes/year); intersection collision avoidance (approx. 1.9 million police-reported crashes/year); lane change, merge collision avoidance (approx. 250,000 police-reported crashes/year). The research activities under the IVI program are focused on finding effective solutions to the problem of motor vehicle crashes. The process for finding these solutions follows these general steps:

1. Identify promising opportunities to help drivers avoid crashes.
2. Demonstrate that solutions are feasible.
3. Validate practical solutions on real roads with real drivers.

Benefit estimates are refined at each step as our understanding of the system effectiveness improves.

The program will address problem areas in four classes, or "platforms," of vehicles. These are light, commercial, transit, and specialty vehicles. Light vehicles are passenger vehicles, light trucks, vans, and sport utility vehicles. Commercial vehicles are heavy trucks and interstate buses. Transit vehicles include all non-rail vehicles operated by transit agencies, and specialty vehicles include emergency response, enforcement, and highway maintenance vehicles. Vehicles have been categorized into the four platforms to improve safety by focusing on the unique problems encountered in their respective environments. The inclusion of the four individual platforms will allow the program to expedite the commercial availability of driver assistance systems across all platform types. Although the largest problem area is in light vehicles, IVI researchers will be able to conduct field tests, and quantify the benefits of some systems in the other platform areas before they are ready to be tested on light vehicles. This will provide a better understanding of the benefits, and enable the program to provide guidance on where best to conduct future research.

Driver Assistance – All Platforms - Safety Systems

ADVANCED DRIVER-VEHICLE INTERFACES AND REVALIDATION OF DROWSY DRIVER DETECTION

Description:

The purpose of this project is to develop advanced driver-vehicle interfaces (DVI), and revalidate a second generation drowsy driver detection system in preparation for subsequent field operational testing in FY 2003. The project is a component of an ongoing scientific and engineering development of a drowsy driver detection and warning system for commercial vehicle drivers. Project products include:

- Design selection criteria for drowsy driver detection and warning system DVI.
- Implementation of an optimal user interface for field operational testing.
- Laboratory revalidation of drowsy driver detection metrics.
- Examination of alternative drowsiness detection sensors.

University of Pennsylvania (UPenn) is conducting the validation study of the PERCLOS camera, Carnegie Mellon University (CMU) is evaluating during over-the-road conditions the driver-vehicle interface conditions which interprets the time the eyes are closed (PERCLOS camera) to the distance traveled, and the Virginia Tech Transportation Institute (VTTI) will complete the analysis of the PERCLOS camera under an array of conditions using their SmartRoad.

Project Location: Blacksburg, Virginia; Pittsburgh, Pennsylvania; Philadelphia, Pennsylvania

Contractor(s): Virginia Polytechnic and State University VTTI; CMU, University of Pennsylvania (UPenn)

Start Date: September 2001

***End Date*:** February 2003

Estimated Total ITS Funds: $1,287,024

Estimated Total Project Cost: $1,287,024

***Contacts*:**

Paul Rau	NHTSA Headquarters, NRD-13	(202) 366-0418
Tim Johnson	FMCSA, MC-RTT	(202) 358-5649

DRIVER WORKLOAD METRICS

Description: The purpose of this project is to develop measurable, repeatable driver workload metrics for both visual and cognitive demand that can effectively assess which types of driver interface tasks are appropriate to perform when the vehicle is in motion. Researchers will then identify appropriate design approaches for driver interfaces to guide emerging collision warning and comfort-and-convenience information systems in order to provide acceptable workload performance ratings.

Project Location: Detroit, Michigan

Contractor(s): Crash Avoidance Metrics Partnership (CAMP), Ford, General Motors, Toyota, Nissan

Start Date: April 2001

***End Date*:** April 2004

Estimated Total ITS Funds: $1,700,000

Estimated Total Project Cost: $3,800,000

***Contacts*:**

Mike Perel	NHTSA Headquarters, NRD-13	(202) 366-5675

ENABLING RESEARCH CONSORTIUM-ENHANCED DIGITAL MAPS

Description: The purpose of this project is to develop map database specifications which will enable and/or improve driver safety assistance systems. Enhanced Digital Maps for Safety (EdMap), will develop a variety of digital map data base enhancements that enable or improve the performance of various driver assistance safety systems presently under development or consideration. It is now widely believed that digital map navigation may be able to act as an additional sensor for various driver assistance systems, providing information about the vehicle's relationship to the roadway infrastructure that is not feasible to obtain with other sensors such as radar or computer vision. This will not obviate the need for other sensors, but may add a necessary component to be fused with other data sources for successful implementation of future systems. The results of this effort will provide direction to map suppliers regarding enhancements needed to enable future driver assistance systems, and establish the preliminary feasibility of generating and maintaining these enhancements.

Project Location: Detroit, Michigan

Contractor(s): Crash Avoidance Metrics Partnership, Ford, General Motors, Daimler-Chrysler, Nissan, Toyota, Navigation Technologies

Start Date: April 2001

***End Date*:** April 2004

Estimated Total ITS Funds: $8,200,000

Estimated Total Project Cost: $8,200,000

***Contacts*:**

Toni Wilbur	FHWA - TFHRC, HRDO-02	(202) 493-3269
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

ENABLING RESEARCH CONSORTIUM-FORWARD COLLISION WARNING

Description: This project is an extension of the preliminary alert timing and alert requirements development effort in the previous cooperative agreement between USDOT and CAMP. The current project involves three major lines of research. One focus is to obtain additional "normative", baseline data in order to better define crash alert timing requirements under a wider range of conditions than were examined in the previous CAMP program (e.g., lead vehicle moving at a constant speed, lead vehicle decelerating at non-constant levels, nighttime conditions, wet road conditions). A second focus attempts to better understand what levels of nuisance alerts are acceptable to drivers. This effort will also build upon work conducted in the earlier CAMP forward collision warning (FCW) system program in which a set of "operational scenarios" were defined which may cause FCW systems to issue inappropriate crash alerts (e.g., when approaching a guardrail on a curve, overhead signs, or bridges). A third focus is to better understand the relationship between data obtained employing the CAMP surrogate target methodology under closed-course conditions and data obtained with the National Advanced Driving Simulator (NADS). More specifically, this effort would examine the relationship between last-second braking maneuvers and lane-change maneuvers with the CAMP closed-course versus NADS approach. Assuming there is a reasonable correspondence between these closed-course and driving simulator findings, further work would be conducted to examine crash alert timing and crash alert modality.

Project Location: Detroit, Michigan

Contractor(s): Crash Avoidance Metrics Partnership (CAMP), Ford, General Motors

Start Date: April 2001

***End Date*:** October 2003

Estimated Total ITS Funds: $2,300,000

Estimated Total Project Cost: $3,000,000

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

ENABLING RESEARCH CONSORTIUM-VISUAL/COGNITIVE WORKLOAD

Description: The purpose of this project is to develop an objective test to determine and define device operations that should not be operable by the driver while the vehicle is in motion.

Project Location: Detroit, Michigan

Contractor(s): Crash Avoidance Metrics Partnership, Ford, General Motors, Toyota, Nissan

Start Date: April 2001

***End Date*:** April 2004

Estimated Total ITS Funds: $3,800,000

Estimated Total Project Cost: $3,800,000

***Contacts*:**

Michael Perel	NHTSA Headquarters, NRD-13	(202) 366-5675
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

EVALUATION OF LANE CHANGE COLLISION AVOIDANCE SYSTEMS USING NADS

Description:

This project will evaluate the conditions under which the use of a Lane Change Collision Avoidance System (LC/CAS) with only a proximity warning system, i.e., blind spot detector, can lead to unsafe driver behavior. The specific area of concern is situations that could potentially expose drivers to collisions in certain traffic scenarios due to inherent limitations of proximity-only warnings.

This study will examine and compare five CAS types, namely a representative commercially available proximity warning system; the TRW proximity only CAS system; the TRW comprehensive system; convex mirrors on the left side of the vehicle; and a baseline with standard passenger vehicle mirrors. An experimental plan to evaluate the different CAS using the NADS will be developed. Once the plan is approved by NHTSA, the simulator study will proceed.

Project Location: Detroit, Michigan and Iowa City, Iowa

Contractor(s): Virginia Polytechnic and State University, Veridian

Start Date: September 2001

***End Date*:** June 2003

Estimated Total ITS Funds: $379,718

Estimated Total Project Cost: $379,718

***Contacts*:**

Alrik Svenson	NHTSA Headquarters, NRD-13	(202) 366-0436
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

INFRASTRUCTURE CONSORTIUM

Description:

Under this cooperative agreement, the Infrastructure Consortium, a Regional Pooled Fund led by the California Department of Transportation, is conducting research and development of innovative intersection collision avoidance systems. Within this agreement, the Consortium will develop prototype intersection collision avoidance systems, based on infrastructure-based concepts, that might be considered for future field operational tests. The following goals have been identified for the Infrastructure Consortium:

- Sponsor and support innovative research in IVI and related ITS technologies and services.
- Serve as stakeholders in ITS infrastructure by representing state and local governments, partnering with the vehicle manufacturing industry, and partnering with the transportation infrastructure industry to develop innovative technologies.
- Improve safety by deploying infrastructure.

Project Location: Sacramento, California and Various Locations

Partner(s): California, Minnesota, and Virginia Departments of Transportation; California PATH; University of Minnesota; Virginia Polytechnic and State University

Start Date: February 2002

***End Date*:** January 2005

Estimated Total ITS Funds: $3,700,000

Estimated Total Project Cost: $5,500,000

***Contacts*:**

Robert Ferlis	FHWA - TFHRC, HRDO-4	(202) 493-3268

LATERAL AND LONGITUDINAL ROAD DEPARTURE RESEARCH, PART II

Description: The purpose of this project is to develop an understanding of driver performance in road departure scenarios. The experimental activities conducted in this research initiative are intended to provide evidence for mediating the response characteristic of a kinematic road departure warning algorithm based on human performance.

Project Location: East Liberty, Ohio

Contractor(s): Vehicle Research and Test Center

Start Date: March 2002

***End Date*:** March 2003

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $1,600,000

***Contacts*:**

Paul Rau	NHTSA Headquarters, NRD-13	(202) 366-0418

LIGHT VEHICLE ROAD DEPARTURE FIELD OPERATIONAL TEST EVALUATION

Description: This project will conduct an independent evaluation of the Light Vehicle Road Departure Crash Warning Field Operational Test (FOT). The evaluation of the road departure crash warning system (RDCW) will involve assessing safety benefits, measuring driver acceptance, measuring system performance, and estimating the deployment potential of the RDCW system. Driver and RDCW system performance data will be collected throughout an FOT environment with test vehicles and drivers operating on real roads under realistic conditions.

Project Location: Detroit, Michigan

Contractor(s): Volpe National Transportation Systems Center

Start Date: April 2001

***End Date*:** December 2004

Estimated Total ITS Funds: $2,030,500

Estimated Total Project Cost: $2,030,500

***Contacts*:**

Lloyd Emery	NHTSA Headquarters, NRD-12	(202) 366-5673
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

LIGHT VEHICLE INTERSECTION CONTROL VIOLATION COUNTERMEASURES

Description: The purpose of this project is to prepare performance specifications, objective tests and develop a test bed vehicle in support of a planned field operational test of traffic control violation countermeasures. Project deliverables will include complete performance specifications and objective test development for deployment versions.

Project Location: Blacksburg, Virginia

Contractor(s): Virginia Polytechnic and State University

Start Date: May 2002

***End Date*:** September 2004

Estimated Total ITS Funds: $1,300,000

Estimated Total Project Cost: $1,800,000

***Contacts*:**

David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

LIGHT VEHICLE, URBAN NATURALISTIC DRIVING DATA COLLECTION PROGRAM

Description: The purpose of this project is to collect naturalistic driving data, in light vehicles, in an urban environment. The data collection activity will also serve as a pilot program for large-scale data collection methods. These measures will prepare for large-scale data collection activities designed to capture pre-crash data.

Project Location: Various University Sites

Contractor(s): Virginia Polytechnic and State University, Veridian, University of Michigan Transportation Research Institute

Start Date: April 2001

***End Date*:** September 2004

Estimated Total ITS Funds: $2,200,000

Estimated Total Project Cost: $2,200,000

***Contacts*:**

David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

PAVEMENT CONDITION SENSOR

Description: The purpose of this project is to develop the capability to measure the coefficient of friction on a road automatically. The research effort will result in the development of loss of traction countermeasure capabilities comprised of hardware and software.

Project Location: Waltham, Massachusetts

Contractor(s): Foster-Miller, Inc.

Start Date: March 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $300,000

Estimated Total Project Cost: $300,000

***Contacts*:**

Lloyd Emery	NHTSA Headquarters, NRD-12	(202) 366-5673
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

REAR-END COLLISION AVOIDANCE SYSTEM (RECAS) EVALUATION

Description: This project will conduct an independent evaluation of the rear-end collision warning system which is a radar-based device that provides both visual and audible warnings to the driver. The driver is warned of objects that are close in front, or in the same lane such as a stopped or slower moving vehicle. Other goals include: achieving an in-depth understanding of system benefits; obtaining measures of driver performance and comprehensive ratings of user acceptance; determining the performance and capability potential of these systems; assessing product maturity for deployment; and addressing institutional and legal issues that might impact deployment.

Project Location: Boston, Massachusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: August 1999

***End Date*:** May 2004

Estimated Total ITS Funds: $1,400,000

Estimated Total Project Cost: $4,548,000

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

ROAD DEPARTURE CRASH WARNING ALGORITHM DEVELOPMENT PROGRAM

Description: The purpose of this project is to develop a Road Departure Crash Warning (RDCW) algorithm to process situational awareness, and determine if warnings should be issued to alert drivers of potential imminent crashes due to road departure. The algorithm will incorporate two warning functions - Lane Drift Warning (LDW) and Curve Speed Warning (CSW). This algorithm will be used to support evaluation of the Road Departure Crash Warning Field Operational Test.

Project Location: Laurel, Maryland

Contractor(s): Johns Hopkins-Applied Physics Laboratory

Start Date: October 2002

***End Date*:** July 2003

Estimated Total ITS Funds: $921,096

Estimated Total Project Cost: $921,096

***Contacts*:**

Lloyd Emery	NHTSA Headquarters, NRD-12	(202) 366-5673

VEHICLE SAFETY COMMUNICATIONS PROJECT

Description: The purpose of this project is to facilitate and expedite the deployment of Advanced Driver Assistance Safety Systems. This project's focus will be on ensuring that the developing Dedicated Short-Range Communications (DSRC) standards are fully supportive of vehicle safety applications, and that they define common DSRC requirements.

Project Location: Michigan and California

Contractor(s): Crash Avoidance Metrics Partnership (CAMP)

Start Date: September 2002

***End Date*:** September 2003

Estimated Total ITS Funds: $1,600,000

Estimated Total Project Cost: $1,600,000

***Contacts*:**

David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674
James Arnold	FHWA - TFHRC, HRDO-04	(202) 493-3265

AUTOMOTIVE COLLISION AVOIDANCE SYSTEM FIELD OPERATIONAL TEST

Description: The purpose of this project is to assess the performance of rear-end collision warning systems in operational environments. The conduct of a field operational test employing state-of-the art rear-end collision warning systems will provide the basis for documenting system performance and effectiveness and potential safety benefits.

Project Location: Detroit, MI; Ann Arbor, MI; Malibu, CA; Kokomo, IN

Partner(s): Delphi-Delco Electronics, Raytheon, University of Michigan Transportation Research Institute (UMTRI)

Start Date: June 1999

***End Date*:** May 2004

Estimated Total ITS Funds: $21,500,556

Estimated Total Project Cost: $35,126,975

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	202 366-0168

LIGHT VEHICLE ROAD DEPARTURE FOT

Description: The purpose of this field operational test (FOT) is to assess the effectiveness of a driver warning system capable of alerting drivers when the vehicles they are operating are on the verge of drifting off the road or when vehicle speed is too high to safely negotiate an upcoming curve. The crash avoidance systems under evaluation will be fully integrated into the FOT vehicles so that the test vehicles will have the appearance and feel of new production cars, but are instrumented to collect data for the system evaluation.

Project Location: Detroit, Michigan

Partner(s): NHTSA, Assistware, Navigation Technologies, Visteon

Start Date: November 2001

***End Date*:** December 2004

Estimated Total ITS Funds: $10,476,650

Estimated Total Project Cost: $16,274,800

***Contacts*:**

Lloyd Emery	NHTSA Headquarters, NRD-12	(202) 366-5673
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

Driver Assistance - Transit

FORWARD AND SIDE COLLISION WARNING INTEGRATION

Description: This project is a joint initiative between Pennsylvania DOT (PennDOT) and California DOT (Caltrans). The purpose of the project is to develop specifications, and test prototypes to integrate lane change/merge and forward/side collision warning systems on transit buses operated by San Mateo, CA and Allegheny, PA counties. The allocation of project responsibilities designates PennDOT as the lead for side sensors and Caltrans for LIDAR sensors. These sensors are designed to alert the bus operator to surrounding vehicle traffic movement (Caltrans with LIDAR), and enable detection of small objects (PennDOT with side sensors). The objective of the application of these technologies is to reduce bus accidents and passenger injury.

Project Location: San Mateo, CA and Allegheny, PA

Partner(s): FTA; Pennsylvania Department of Transportation (PennDOT); California Department of Transportation (Caltrans); San Mateo County, CA; Allegheny County, PA

Start Date: June 2002

***End Date*:** October 2004

Estimated Total ITS Funds: $2,300,000

Estimated Total Project Cost: $2,500,000

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841

TRANSIT BUS RAPID TRANSIT (BRT)/IVI LANE ASSIST

Description: The purpose of this project is to develop specifications for bus rapid transit (BRT) type applications of intelligent vehicle technology that can be used for lane assist systems. Lane assist systems will aid transit authorities to implement guidance and/or assistance systems on transit buses to allow buses to safely operate in narrow lanes. The project's first phase includes a requirements analysis among the industry transit agencies expressing a commitment to implementing lane assist systems, and a comparison of the technologies available to satisfy the desired requirements. A human factors study of the impact on operators of lane assist systems will be conducted. The final product will be a specification for lane assist systems.

Project Location: Minneapolis, Minnesota

Contractor(s): Metro Transit

Start Date: October 2001

***End Date*:** February 2003

Estimated Total ITS Funds: $400,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841

TRANSIT REAR IMPACT PERFORMANCE SPECIFICATION

Description: This project will develop the performance specification for a transit rear impact collision warning system. Countermeasures resulting from this activity will reduce the occurrence and severity of rear impact collisions. Concepts being explored include warning following drivers of collision risk, impact mitigation, and crash event data recording. Since this project initiates work in a previously unexplored area, initial focus will be directed at clarifying the problem's characteristics and scale. As problem definition evolves, key system concepts will be developed, and potential technology solutions will be analyzed. Project products will include performance specifications, driver-vehicle interface design guidelines, and development of and evaluation of objective test procedures.

Project Location: Ann Arbor, Michigan

Contractor(s): Ann Arbor Transportation Authority

Start Date: August 2000

***End Date*:** August 2003

Estimated Total ITS Funds: $930,000

Estimated Total Project Cost: $1,162,500

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841

EVALUATION OF INTEGRATION OF FORWARD AND LANE CHANGE FIELD OPERATIONAL TEST

Description: The purpose of this project is to conduct an evaluation of a field operational test (FOT) of integrated forward and side collision warning systems designed to alert bus drivers of vehicle movements at the front and sides of a bus. Pennsylvania DOT (PennDOT) and California DOT (Caltrans) provided the operational test vehicles. The PennDOT buses are equipped with five proximity sensors on each side to detect small obstacles and provide anticipatory warnings. Caltrans buses use three LIDAR sensor systems and three warning light displays to alert drivers of the presence of vehicle traffic movement on either, or on both sides as well as at the front of their vehicles. The evaluation will assess the effectiveness of each system in reducing bus crashes and passenger injuries.

Project Location: Columbus, Ohio

Contractor(s): Battelle

Start Date: September 2001

***End Date*:** December 2004

Estimated Total ITS Funds: $400,000

Estimated Total Project Cost: $400,000

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841

SMALL BUSINESS INNOVATIVE RESEARCH (SBIR) INTEGRATED DISPLAY SUPPORT

Description: The purpose of this project is to coordinate the Federal Transit Administration Small Business Innovative Research Integrated Forward and Side Collision Warning Display project with Intelligent Vehicle Initiative program's transit integrated forward and side collision warning project.

Project Location: Waltham, Massachusetts

Contractor(s): Foster Miller

Start Date: June 2002

***End Date*:** March 2003

Estimated Total ITS Funds: $40,000

Estimated Total Project Cost: $40,000

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841

Platform Specific - Commercial Vehicles

DEVELOPMENT OF REQUIREMENTS AND FUNCTIONAL SPECIFICATIONS FOR EVENT DATA RECORDERS

Description: Event Data Recorders (EDRs) record vehicle data at the time of a crash. The purpose of this project is to use the work products of the NHTSA EDR working group and additional EDR reference materials to define specific EDR requirements and functional specifications for the reconstruction of crashes involving large trucks and buses (>10,000 lbs Gross Vehicle Weight). EDR functional specifications will be developed for both complete crash reconstruction and less detailed analyses of crashes. Requirements will be developed for the EDR components, hardware, software, sensors, and databases. The resulting EDR will record data at a sampling rate that is sufficient to define vehicle dynamics, and preserve data in the event of a vehicle crash or an electrical power loss. A cost effectiveness analysis and summary of the issue of data ownership will also be completed for this project.

Project Location: Buffalo, New York

Contractor(s): Veridian Engineering, Battelle Memorial Institute

Start Date: October 2002

***End Date*:** December 2003

Estimated Total ITS Funds: $299,989

Estimated Total Project Cost: $299,989

***Contacts*:**

Amy Houser	FMCSA, MC-RTT	(202) 358-5680

INTEGRATION AND FLEET TEST OF SAFETY CRITICAL SYSTEMS

Description:

This project is performing a Congressionally-mandated pilot test to demonstrate the use of fatigue-related technologies to enhance commercial motor vehicle driver fatigue management within the current hours-of-service rules. The project is a cooperative research initiative between U.S. DOT's Federal Motor Carrier Safety Administration and Transport Canada with involvement of the Intelligent Vehicle Initiative (IVI) Commercial Vehicle Platform.

This pilot test combines driver alertness monitoring (using the eyelid droop measure known as PERCLOS), already a major technological component of the ITS IVI, with a sleep history monitoring device (Actigraph) with an embedded sleep-wakefulness model, a lane tracking device (SafeTRAC), and the Howard Powered Center Steering System. Numerous research studies sponsored by the U.S. DOT, and others, have provided proof-of-concept for the validity of the various alertness/performance measurements employed. These technologies are now ready to progress from laboratory/experimental use to employment as fatigue management aids in an operational "beta test."

The principal benefits of this effort will be an examination of the most promising technological intervention, and of other countermeasures, identified in the Truck Driver Fatigue and Alertness Study followed up by field tests in controlled environments and/or trucking operations.

The final report will document evaluation of the drowsy driver interventions and countermeasures.

Project Location: Various Locations in U.S. and Canada

Contractor(s): American Trucking Associations, Transportation Research Institute

Start Date: October 1998

***End Date*:** September 2003

Estimated Total ITS Funds: $700,000

Estimated Total Project Cost: $1,912,594

***Contacts*:**

Bob Carroll	FMCSA, MC-RTT	(202) 358-5685
Tim Johnson	FMCSA, MC-RTT	(202) 358-5649

EVALUATION OF GENERATION 0 FIELD OPERATIONAL TEST - MINNESOTA DEPARTMENT OF TRANSPORTATION

Description: The purpose of this project is to perform an independent evaluation of the MnDOT Intelligent Vehicle Initiative Field Operational Test. The evaluation will determine the benefits and deployment potential of intelligent vehicle safety systems for specialty vehicle applications. Evaluators prepared an evaluation plan including analytical methods for estimating safety benefits (i.e., number of crashes avoided at full deployment), surveys and interviews for assessing driver acceptance and opinions, and a benefits cost analysis for comparing the value of benefits with the costs of deploying and maintaining these systems.

Project Location: Columbus, Ohio

Contractor(s): Battelle Memorial Institute

Start Date: April 2000

***End Date*:** January 2003

Estimated Total ITS Funds: $806,981

Estimated Total Project Cost: $806,981

***Contacts*:**

Randall VanGorder	FHWA - TFHRC, HRDO-03	(202) 493-3266

EVALUATION OF GENERATION 0 FIELD OPERATIONAL TEST - FREIGHTLINER CORPORATION

Description:

The purpose of this project is to perform an independent evaluation of the Freightliner field operational test. The evaluation will answer the following questions:

1. Do drivers drive more safely with the system than without?
2. Do vehicles equipped with the system have fewer crashes than vehicles without the system?
3. How many crashes, injuries and fatalities could be avoided if all large trucks operating in the United States were equipped with the system?

Rollovers account for about half of driver fatalities in large truck crashes. Freightliner, Praxair and the University of Michigan are partnered with USDOT to conduct the FOT of Rollover Stability Advisor/Control System with a Lane Tracker device. This system warned drivers if they were approaching the threshold for their vehicle. Road testing began in September 2000 and was completed in September 2001.

Project Location: East Liberty, Ohio

Contractor(s): Battelle Memorial Institute

Start Date: December 2001

***End Date*:** January 2003

Estimated Total ITS Funds: $701,422

Estimated Total Project Cost: $701,422

***Contacts*:**

Carolyn Temperine	FMCSA, MC-EFE-CT	(518) 431-4145	Ext. 270

EVALUATION OF GENERATION 0 FIELD OPERATIONAL TEST - MACK TRUCKS, INC.

Description:

The Mack Field Operational Test will evaluate three systems: A trucker advisory system, an automatic collision notification system and a lane departure system. The trucker advisory system uses a satellite-based location system and a map database to warn drivers when they are approaching a geographical location that has a high frequency of commercial vehicle crashes.

The automatic collision notification system sends an emergency signal by satellite to the fleet operators' emergency control center and allows the company to notify the appropriate local authorities with all the pertinent information.

The purpose of the evaluation is to assess, in a commercial, operational environment, the effectiveness of the lane departure warning system which alerts drivers when their trucks inadvertently drift out of their lanes.

Project Location: Battelle Memorial Institute - Ohio

Contractor(s): Battelle

Start Date: September 2000

***End Date*:** December 2004

Estimated Total ITS Funds: $1,313,946

Estimated Total Project Cost: $1,313,946

***Contacts*:**

Tim Johnson	FMCSA, MC-RTT	(202) 358-5649

EVALUATION OF GENERATION 0 VOLVO TRUCKS OF NORTH AMERICA FIELD OPERATIONAL TEST

Description: The purpose of this project is to conduct an evaluation of the Generation 0 Field Operational Test (FOT) - Volvo Trucks North America, Inc. The evaluation will assess the effectiveness of the advanced safety package employed on the Volvo test trucks. The advanced safety bundle consists of the Electronically Controlled Brake System, the Collision Warning System and Adaptive Cruise Control. Effectiveness will be evaluated in terms of the advanced safety package's capability to reduce the number and severity of tractor trailer crashes specifically associated with rear-end collisions (forward crash), and lane change collisions. A secondary analysis will assess the effectiveness of the Electronically Controlled Brake System in reducing braking distances from high speeds, and therefore its technological potential for replacing drum brakes.

Project Location: Columbus, Ohio

Contractor(s): Battelle Memorial Institute

Start Date: September 2000

***End Date*:** December 2003

Estimated Total ITS Funds: $1,407,193

Estimated Total Project Cost: $1,407,193

***Contacts*:**

Tim Johnson	FMCSA, MC-RTT	(202) 358-5649

GENERATION 0 FIELD OPERATIONAL TEST - MACK TRUCKS, INC.

Description:

This was one of four field operational tests conducted under the Intelligent Vehicle Initiative program involving the use of crash avoidance technologies.

The Mack Field Operational Test will evaluate three systems: A trucker advisory system, an automatic collision notification system and a lane departure system. The trucker advisory system uses a satellite-based location system and a map database to warn drivers when they are approaching a geographical location that has a high frequency of commercial vehicle crashes.

The automatic collision notification system sends an emergency signal by satellite to the fleet operators' emergency control center, and allows the company to notify the appropriate local authorities with all the pertinent information.

The purpose of the Field Operational Test is to test in a commercial, revenue generation environment, the effectiveness of the lane departure warning system's alerts to the driver when the truck inadvertently drifts out of its lane.

Project Location: Alabama, Florida, Georgia, Kentucky, Mississippi, New York, North Carolina, South Carolina, Tennessee, Texas and Virginia,

Partner(s): McKenzie Tank Lines; Vehicle Enhancement Systems, Inc.; Xata Corporation; Assistware Technologies; Richard Bishop Consulting

Start Date: November 1999

***End Date*:** October 2004

Estimated Total ITS Funds: $1,156,000

Estimated Total Project Cost: $1,979,642

***Contacts*:**

Tim Johnson	FMCSA, MC-RTT	(202) 358-5649

GENERATION 0 FIELD OPERATIONAL TEST - VOLVO TRUCKS NORTH AMERICA, INC.

Description:

This project is one of four field operational tests conducted under the Intelligent Vehicle Initiative program involving the use of crash avoidance technologies.

The project involves one hundred new Volvo tractors. Fifty of them will be equipped with the bundled advanced safety systems, and the remaining 50 (control vehicles) will be equipped with standard drum brakes, equipped with WABCO anti-lock brake controls, and the current generation Eaton-Vorad Collision Warning System. The equipped tractors will be used with various trailers from the US Xpress fleet.

Systems whose effectiveness will be tested include the Electronically Controlled Brake System (EBS), the Collision Warning System (CWS) and Adaptive Cruise Control (ACC).

The advanced safety system bundle is expected to reduce the number and severity of tractor-trailer accidents specifically associated with rear-end collisions (forward crash) and lane change collisions. The EBS is also anticipated to improve effectiveness of braking from high speeds through improved control of thermal degradation, and the maintenance of stability during braking.

Once road testing and data collection on 100 test tractors are completed for the FOT, a collision warning system (advanced Eaton-Vorad) including closing distance warning, blind spot objective warning, electronic braking, disk brakes and adaptive cruise control will be tested.

Project Location:

US Xpress, Inc. will integrate the 100 test tractors into their fleet for normal revenue generating service. They will operate on public roads throughout the U.S.

Partner(s):

US Xpress Leasing, Inc. (fleet operator)

Start Date:

November 1999

***End Date*:**

December 2003

Estimated Total ITS Funds:

$3,490,000

Estimated Total Project Cost:

$5,336,000

***Contacts*:**

Jim Britell	NHTSA Headquarters, NRD-13	(202)366-5678

Completed Projects

ADVANCED VEHICLE CONTROL SYSTEMS INFRASTRUCTURE AND TRAFFIC IMPACTS

Description:

Several types of Advanced Vehicle Control Systems (AVCS) were studied by NHTSA, including run-off-the-road warning/avoidance and intersection collision warning/avoidance systems. This major research effort was expected to raise numerous issues concerning infrastructure interactions with these types of systems. In many cases, system concept feasibility is dependent on the affected infrastructure elements. This project addressed infrastructure-related issues in close coordination with NHTSA. Concurrently, these control systems were conceptualized and existing concepts evaluated to optimize traffic flow. The contracts were structured to conduct work on a task order basis; individual tasks were generated based on the status of ongoing AVCS efforts. A key focus was applications development for off-highway vehicle operations areas, such as intermodal terminals and busways. Another focus was highway maintenance vehicles. This project also prototyped and tested infrastructure-based safety systems with a focus on hazardous intersections.

Project Location: Falls Church, Virginia

Contractor(s): E-Systems

Start Date: May 1994

***End Date*:** February 2000

Estimated Total ITS Funds: $742,634

Estimated Total Project Cost: $1,207,685

***Contacts*:**

Robert Ferlis	FHWA - TFHRC, HRDO-04	(202) 493-3268

ANALYTICAL SUPPORT/ANALYSIS OF ACCIDENT AND DRIVER PERFORMANCE DATABASES

Description: This project addressed target crash problem size assessment and statistical descriptions. The goals of this project were 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 ITS crash avoidance countermeasures, and (2) assess the effects of existing vehicle design features on the incidence and severity of crashes in the "real world."

Project Location: Washington, DC

Contractor(s): Information Management Consultants, Inc. (IMC)

Start Date: May 1990

***End Date*:** September 1999

Estimated Total ITS Funds: $75,000

Estimated Total Project Cost: $75,000

***Contacts*:**

Duane Perrin	NHTSA Headquarters, NRD-13	(202) 366-5664

ASSESSMENT OF POTENTIAL BIOLOGICAL EFFECTS FROM ELECTROMAGNETIC RADIATION IN MICROWAVE AND INFRARED REGIONS

Description: This project conducted an evaluation of potential health hazards that might result from widespread usage of collision avoidance systems using active sensors.

Project Location: Pittsburgh, Pennsylvania

Contractor(s): Carnegie Mellon Research Institute

Start Date: July 1994

***End Date*:** May 1995

Estimated Total ITS Funds: $53,474

Estimated Total Project Cost: $53,474

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

AUTOMATED COLLISION NOTIFICATION (ACN) OPERATIONAL FIELD TEST

Description: This project was an operational field test of an advanced in-vehicle system that determines that a serious collision has occurred and automatically summons Emergency Medical Services (EMS) response. The project team designed, built and deployed an automated collision notification system (ACN), using 1000 privately owned cars in a large area covering the western portion of New York State.

Project Location: Erie County, New York

Partner(s): CALSPAN Advanced Technology Center, the New York DOT, General Motors, Cellular One, Rockwell, Erie County Emergency Management Service

Start Date: September 1995

***End Date*:** December 2001

Estimated Total ITS Funds: $3,472,358

Estimated Total Project Cost: $4,335,453

***Contacts*:**

Arthur Carter	NHTSA Headquarters, NRD-12	(202) 366-5669

AUTOMOTIVE COLLISION AVOIDANCE SYSTEM DEVELOPMENT

Description: The purpose of this project was to provide a highly focused effort to accelerate the deployment of near-term collision warning systems. Secondary goals were to advance the development of promising, but immature technologies and to reduce manufacturing costs of key system components. This project was funded by The Defense Advanced Research Projects Agency and administered by NHTSA as a cooperative agreement with several leading automotive industry and academic research organizations.

Project Location: Kokomo, Indiana

Contractor(s): Delco Electronics

Start Date: January 1995

***End Date*:** May 1998

Estimated Total ITS Funds: $6,116,000

Estimated Total Project Cost: $13,034,000

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

AUTONAV/DOT

Description: The U. S. Department of Transportation's National Highway Traffic Safety Administration and the Department of Defense seek to collectively develop dual use emerging collision avoidance technologies to improve surface transportation safety. The U.S. Army Research Laboratory conducted tests and evaluations of each product technology element of the Autonomous Vehicle Navigation Control System (AUTONAV) project to determine the potential for contribution to the collision avoidance capability of motor vehicles and their drivers.

Project Location: Aberdeen and Gaithersburg, Maryland

Contractor(s): The U. S. Army Research Laboratory (ARL)

Start Date: October 1996

***End Date*:** June 1998

Estimated Total ITS Funds: $300,000

Estimated Total Project Cost: $300,000

***Contacts*:**

August Burgett	NHTSA Headquarters, NRD-12	(202) 366-5672

BENEFIT ASSESSMENT OF INTELLIGENT VEHICLE SYSTEMS

Description: This project developed needed tools and methodologies to assess the safety and other benefits of intelligent vehicle services.

Project Location: Boston, Massachusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: October 1998

***End Date*:** September 2002

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,000,000

***Contacts*:**

Robert Ferlis	FHWA - TFHRC, HRDO-04	(202) 493-3268

BRAKING ANALYSIS FOR COLLISION AVOIDANCE: HEAVY COMMERCIAL VEHICLES

Description: This project studied the feasibility of adding automatic braking to heavy commercial vehicles. The project included braking performance modeling, development of design requirements and fabrication and testing of prototype hardware. This 18-month program concluded with extensive test track work and a demonstration of the prototype system.

Project Location: Southfield, Michigan

Contractor(s): Eaton Corporation

Start Date: March 1994

***End Date*:** December 1996

Estimated Total ITS Funds: $451,138

Estimated Total Project Cost: $559,290

***Contacts*:**

Jim Britell	NHTSA Headquarters, NRD-13	(202) 366-5678

CHARACTERIZATION OF A FORWARD-LOOKING AUTOMOTIVE RADAR SENSOR

Description: This project was a cooperative agreement to develop a knowledge base of radar cross-section data from measurements taken in the laboratory, and a variety of freeway settings, using a 94GHZ forward looking automotive radar sensor.

Project Location: Ann Arbor, Michigan

Contractor(s): Environmental Research Institute of Michigan (ERIM) and TRW, Inc.

Start Date: March 1994

***End Date*:** December 1997

Estimated Total ITS Funds: $880,376

Estimated Total Project Cost: $1,139,487

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

COMMERCIAL VEHICLE COMMUNICATION AND POWERING ENHANCEMENT SYSTEMS - I

Description: This is one of two cooperative agreements that assessed alternative means of providing power and communications on multi-unit combination heavy commercial tractor/trailers. The functional capabilities, limitations, reliability, and practicality were evaluated. The contractor assessed a standard seven-pin connector with multiplexing.

Project Location: Southfield, Michigan

Contractor(s): EATON Corporation

Start Date: April 1995

***End Date*:** March 1998

Estimated Total ITS Funds: $476,169

Estimated Total Project Cost: $828,506

***Contacts*:**

Jim Britell	NHTSA Headquarters, NRD-13	(202) 366-5678

COMMERCIAL VEHICLE COMMUNICATION AND POWERING ENHANCEMENT SYSTEMS - II

Description: This is one of two cooperative agreements that assessed alternative means of providing power and communications on multi-unit combination heavy commercial tractor/trailers. The functional capabilities, limitations, reliability and practicality were evaluated. The contractor assessed a standard 13-pin connector with multiplexing, in conjunction with a fiber optic link, and a bi-directional data bus imposed on a power supply circuit.

Project Location: Kokomo, Indiana

Contractor(s): DELCO Electronics Corporation

Start Date: November 1995

***End Date*:** September 1998

Estimated Total ITS Funds: $575,000

Estimated Total Project Cost: $1,211,884

***Contacts*:**

Jim Britell	NHTSA Headquarters, NRD-13	(202) 366-5678

CRASH AVOIDANCE AND THE OLDER DRIVER

Description: The objective of this project was to conduct an assessment of older driver crash avoidance research needs. The purpose of this initiative was 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.

Project Location: Seattle, Washington

Contractor(s): Battelle Memorial Institute

Start Date: March 1994

***End Date*:** March 1995

Estimated Total ITS Funds: $90,000

Estimated Total Project Cost: $90,000

***Contacts*:**

Mike Perel	NHTSA Headquarters, NRD-13	(202) 366-5675

CRASH AVOIDANCE METRICS PARTNERSHIP (CAMP) - REAR-END COLLISION WARNING RESEARCH, TEST METRICS AND TEST METHODOLOGY DEVELOPMENT PROGRAM

Description: The focus of this effort was to conduct research activities jointly with industry to investigate vehicle-borne systems which address rear-end collisions. The goal of this project was to define and develop pre-competitive enabling elements of rear-end collision warning systems by establishing common analytical methods, performance metrics, test procedures, databases, function definitions, and minimum performance specifications for these systems.

Project Location: Michigan

Contractor(s): General Motors and Ford Motor Company

Start Date: February 1996

***End Date*:** August 1999

Estimated Total ITS Funds: $1,797,757

Estimated Total Project Cost: $3,595,569

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

CRASH AVOIDANCE RESEARCH TECHNOLOGY SUPPORT FOR COMMUNICATIONS, ELECTRONIC CONTROLS AND COMPUTERS - TASK ORDER 1

Description: This was the first task of a 5-year Indefinite Quantity Contract (IQC) designed to support the research needs of NHTSA in the crash avoidance areas pertaining to communications, electronic controls, and computers. The result of this task was identification and assessment of the main features of automotive computer and electronic interface architectures that may affect the deployment of advanced technology crash systems.

Project Location: Virginia

Contractor(s): Stanford Telecommunications, Inc.

Start Date: September 1994

***End Date*:** April 1995

Estimated Total ITS Funds: $104,842

Estimated Total Project Cost: $104,842

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

CRASH AVOIDANCE RESEARCH TECHNOLOGY SUPPORT FOR COMMUNICATIONS, ELECTRONIC CONTROLS AND COMPUTERS - TASK ORDER 2

Description: This was the second task in a 5-year Indefinite Quantity Contract (IQC) designed to support the research needs of NHTSA in the crash avoidance areas pertaining to communications, electronic controls, and computers. The objective of this task was to determine the architectures, interfaces, and data flows needed to support the safety related ITS user services, as defined in the ITS National Program Plan, within the framework of the National ITS Architecture.

Project Location: Virginia

Contractor(s): Stanford Telecommunications, Inc.

Start Date: June 1995

***End Date*:** May 1996

Estimated Total ITS Funds: $175,651

Estimated Total Project Cost: $175,651

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

CRASH AVOIDANCE RESEARCH TECHNOLOGY SUPPORT FOR COMMUNICATIONS, ELECTRONIC CONTROLS, AND COMPUTERS - TASK ORDER 3

Description: This is the third task in a five-year Indefinite Quantity Contract (IQC) designed to support the research needs of NHTSA in the crash avoidance areas pertaining to communications, electronic controls, and computers. The objective of this task was to predict the performance of electronic busses for in-vehicle communication requirements for ITS safety-related user services.

Project Location: Virginia

Contractor(s): Stanford Telecommunications, Inc.

Start Date: July 1996

***End Date*:** May 1997

Estimated Total ITS Funds: $260,377

Estimated Total Project Cost: $260,377

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

CRASH AVOIDANCE RESEARCH TECHNOLOGY SUPPORT FOR COMMUNICATIONS, ELECTRONIC CONTROLS, AND COMPUTERS - TASK ORDER 4

Description: This is the fourth task in a five-year Indefinite Quantity Contract (IQC) designed to support the research needs of NHTSA in the crash avoidance areas pertaining to communications, electronic controls, and computers. The objective of this task was to conduct an extensive analysis of the performance of current and developing in-vehicle data busses to support a variety of automotive safety systems using discrete event simulation software tools and to study and report on the current development of infrastructure and inter-vehicular communications protocols and implementations that affect performance of future safety systems.

Project Location: Virginia

Contractor(s): Stanford Telecommunications, Inc.

Start Date: November 1997

***End Date*:** November 1998

Estimated Total ITS Funds: $424,868

Estimated Total Project Cost: $424,868

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

DATA COLLECTION AND ANALYSIS IN SUPPORT OF REAR-END COLLISION AVOIDANCE SYSTEMS ALGORITHM DEVELOPMENT

Description: The purpose of this project was to develop a database of driver braking behavior when confronted by stopped vehicles. These data can be used to develop and evaluate timing requirements for crash warning algorithms. An instrumented test vehicle was used to record braking characteristics of following vehicles for a large sample of the driving population. Project products include braking characteristics of a large sample of drivers that brake in response to a stopped lead vehicle ahead.

Project Location: Columbus, Ohio

Contractor(s): VRTC

Start Date: August 1999

***End Date*:** June 2002

Estimated Total ITS Funds: $250,000

Estimated Total Project Cost: $250,000

***Contacts*:**

Michael Perel	NHTSA Headquarters, NRD-13	(202) 366-5675
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

DEVELOP AN ANALYTICAL MODELING FRAMEWORK/COLLISION AVOIDANCE SYSTEM

Description: This project is the first task of an Indefinite Quantity Contract (IQC) titled "Crash Avoidance Research Technology Support - Simulation Models." The objective of this task was the development of an analytical framework that can be used to combine a number of ITS program features. The framework provided a means for assessing the safety impact of collision avoidance concepts and systems.

Project Location: Michigan

Contractor(s): University of Michigan Transportation Research Institute (UMTRI)

Start Date: July 1994

***End Date*:** November 1995

Estimated Total ITS Funds: $199,940

Estimated Total Project Cost: $199,940

***Contacts*:**

Lloyd Emery	NHTSA Headquarters, NRD-12	(202) 366-5673

DEVELOPMENT AND EVALUATION OF THE DRIVER INTERFACE FOR A REAR OBJECT WARNING SYSTEM

Description: This project developed and evaluated a prototype back-up warning system driver interface based on the preliminary recommendations of recent COMSIS, Inc. research. The prototype was used to evaluate the usability of recommended warning criteria and interface displays.

Project Location: Silver Spring, Maryland

Contractor(s): WESTAT

Start Date: September 1996

***End Date*:** February 2000

Estimated Total ITS Funds: $261,800

Estimated Total Project Cost: $261,800

***Contacts*:**

Michael Perel	NHTSA Headquarters, NRD-13	(202) 366-5675

DEVELOPMENT OF COLLISION AVOIDANCE DATA FOR INTELLIGENT LIGHT VEHICLES

Description: This project achieved the following objectives:

- Analyzed lane change crashes using 1999 statistics.
- Recomputed the crash pie chart using updated methods and data.
- Developed a methodology for primal causal factor analysis.
- Completed analyses of pedestrian and pedacyclist crashes.
- Prepared preliminary analyses to support the Traffic Control Device violation field operational test.

Project Location: Cambridge, Massachusetts

Contractor(s): Volpe National Transportation Center

Start Date: May 2001

***End Date*:** April 2002

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $500,000

***Contacts*:**

David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

DEVELOPMENT, EVALUATION, AND DEPLOYMENT OF FORWARD CRASH AVOIDANCE SYSTEMS (FOCAS)

Description: This project investigated how the functions provided by an Automatic Intelligent Cruise Control (AICC) system can be extended to produce a rear-end collision avoidance system. A prototype AICC system developed by Leica to demonstrate its infrared sensor technology has been installed in a Saab 9000, which will serve as the development testbed.

Project Location: Michigan

Contractor(s): University of Michigan Transportation Research Institute (UMTRI)

Start Date: May 1994

***End Date*:** August 2000

Estimated Total ITS Funds: $1,499,741

Estimated Total Project Cost: $2,550,288

***Contacts*:**

Art Carter	NHTSA Headquarters, NRD-12	(202) 366-5669

DIRECT PSYCHOPHYSIOLOGICAL MONITORING OF DRIVER ALERTNESS

Description: This Small Business Innovative Research (SBIR) project developed a low cost device for direct monitoring of eye activity as an indicator of driver alertness. The device, Personal Alertness Monitor (PAM), is able to function as a stand alone alertness monitor. PAM also has the capability to work cooperatively with driver performance monitoring systems, as a component of a more complex system that includes continuous measure of driver performance, and with an integrated protocol for the presentation of warning signals. Phase I of the project is complete and resulted in a working prototype.

Project Location: Chelmsford, Massachusetts

Contractor(s): MTI Research, Inc.

Start Date: October 1993

***End Date*:** June 1997

Estimated Total ITS Funds: $243,964

Estimated Total Project Cost: $243,964

***Contacts*:**

Paul Rau	NHTSA Headquarters, NRD-13	(202) 366-0418

DRIVER PERFORMANCE, OLDER DRIVER - THE EFFECT OF FALSE ALARMS ON OLDER DRIVER RESPONSE TO FORWARD COLLISION WARNINGS

Description: This project performed a field experiment designed to investigate how drivers respond to rear-end collision warnings (RECW). The primary impetus for the proposed field experiment was the need to understand how false warnings, defined as warnings presented in the absence of operationally defined threats, will influence driver responses to correct warnings of potential rear-end collisions. The study addressed key issues with respect to exposure of drivers to false warnings. The factors having the highest association with driver performance and behavior with RECW include driver age, warning type (correct warnings, false warnings, correct rejections, false rejections), the time intervals between warnings (short vs. long), and distraction (road vs. in-vehicle glance location).

Project Location: Pennsylvania

Contractor(s): Scientex

Start Date: August 1998

***End Date*:** December 2000

Estimated Total ITS Funds: $199,000

Estimated Total Project Cost: $199,000

***Contacts*:**

Mike Perel	NHTSA Headquarters, NRD-13	(202) 366-5675

DRIVER STATUS/PERFORMANCE MONITORING

Description: This cooperative agreement led to the development of detection algorithms and alerting mechanisms for a vehicle-based drowsy driver detection/warning system and countermeasures that will monitor driver status/performance and detect degraded performance to provide a warning signal or other countermeasure to prevent its continuance. The program developed vehicle-based detection algorithms for reduced driver performance (e.g., symptomatic of drowsiness/fatigue) and tested candidate driver interfaces (i.e., advisories and alerting stimuli). These results provide the basis for the development of an on-road prototype.

Project Location: Blacksburg, Virginia

Contractor(s): Virginia Polytechnic Institute and State University

Start Date: September 1991

***End Date*:** December 1996

Estimated Total ITS Funds: $660,000

Estimated Total Project Cost: $835,000

***Contacts*:**

Paul Rau	NHTSA Headquarters, NRD-13	(202) 366-0418

DRIVER WORKLOAD AND DISTRACTION - VOICE INTERFACES

Description: The purpose of this project was to examine several vehicle communications architectures from the perspective of safety. The study emphasis was on benefits and disbenefits of hands-free architectures relative to hand-held architectures including voice command systems (e.g., AutoPC) that allow control of system functions using exclusively voice. The study effort examined changes in behavior that may occur when using hands-free systems either more frequently or for longer periods of time. Thirty-six cell phone-equipped drivers drove instrumented vehicles on normal discretionary routes, and were provided communications systems with differing interface architectures. Driver workload was assessed using a variety of safety relevant measures.

Project Location: East Liberty, Ohio

Contractor(s): Vehicle Research and Test Center

Start Date: December 2000

***End Date*:** June 2002

Estimated Total ITS Funds: $300,000

Estimated Total Project Cost: $300,000

***Contacts*:**

Mike Goodman	NHTSA Headquarters, NRD-52	(202) 366-5677

EVALUATION OF ASSESSING POTENTIAL HEALTH HAZARDS FROM WIDE-SPREAD USAGE OF ANTI-COLLISION DEVICES USING ITS TECHNOLOGIES

Description: Evaluation of potential health hazards that might result from widespread use of collision avoidance systems using active sensors. This project conducted an evaluation of potential health hazards that might result from widespread usage of anti-collision devices using ITS technologies.

Project Location: S. Deerfield, Massachusetts

Contractor(s): Millitech Corporation

Start Date: October 1993

***End Date*:** December 1995

Estimated Total ITS Funds: $100,000

Estimated Total Project Cost: $124,000

***Contacts*:**

August Burgett	NHTSA Headquarters, NRD-12	(202) 366-5672

EVALUATION OF AUTOMATED COLLISION NOTIFICATION OPERATIONAL FIELD TEST

Description: The objective of this project was to conduct an independent safety evaluation of an operational field test of an in-vehicle system which automatically determines that a serious crash has occurred and then summons an Emergency Medical Services (EMS) response, especially in rural areas.

Project Location: Laurel, Maryland

Contractor(s): Applied Physics Laboratory of the Johns Hopkins University

Start Date: September 1995

***End Date*:** December 2001

Estimated Total ITS Funds: $797,213

Estimated Total Project Cost: $797,213

***Contacts*:**

Art Carter	NHTSA Headquarters, NRD-12	(202) 366-5669

FEASIBILITY OF SENSOR-FRIENDLY VEHICLES AND ROADWAYS TO SUPPORT INTELLIGENT VEHICLE SERVICES

Description: This project identified candidate passive devices and methods to mark vehicles and roadway features to facilitate their reliable identification by sensing systems used by intelligent vehicle systems. The candidate methods were field tested and evaluated. Incremental costs and benefits of deployment served as the basis for a strategic national deployment plan.

Project Location: San Francisco, California

Contractor(s): Bechtel National, Inc.

Start Date: October 1998

***End Date*:** November 2000

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Robert Ferlis	FHWA - TFHRC, HRDO-04	(202) 493-3268

GENERATION 0 FIELD OPERATIONAL TEST - FREIGHTLINER CORPORATION

Description:

This was one of four field operational tests conducted under the Intelligent Vehicle Initiative program involving the use of crash avoidance technologies.

This project was to assess the operational effectiveness of the Roll Stability Advisor (RSA), the Rollover Stability Controller (RSC) and the Lane Tracker (LT). The RSA, an in-cab device, is expected to provide feedback to truck drivers on conditions approaching the threshold of a rollover situation, thus modifying driver behavior and reducing truck rollover fatalities significantly. Six new Freightliner tractors coupled to tanker semi-trailers were equipped with RSA, RSC and LT, and used in the operational test. Initially, baseline data was collected for three months. This was followed by a data collection interval in which all systems were actively employed.

Project Location: La Porte, Indiana

Partner(s): Praxair, Inc.; Road User Research International; Ply (consultant), University of Michigan Transportation Research Institute; Meritor Wabco; Aurora Exhibits

Start Date: November 1999

***End Date*:** December 2002

Estimated Total ITS Funds: $3,933,000

Estimated Total Project Cost: $6,506,000

***Contacts*:**

Carolyn Temperine	FMCSA, MC-EFE-CT	(518) 431-4145	Ext. 270

GENERATION 0 FIELD OPERATIONAL TEST - MINNESOTA DEPARTMENT OF TRANSPORTATION

Description: MnDOT, Navistar, UMn, 3M and the USDOT conducted an FOT of driver assistance technologies to reduce the number and severity of snowplow crashes involving other vehicles and roadside obstacles. Plows equipped with driver assistance technologies such as magnetic roadway tape with on-board sensors, collision warning systems, GIS mapping, 360-degree radar obstruction detection devices, auditory warnings and external light warning systems were tested on state and county highways under low visibility conditions. Data collection took place from November 2001 through July 2002.

Project Location: McLeod County, Minnesota; City of Hutchinson, and Human Factors Laboratories

Partner(s): NHTSA, MnDOT, Altra Technologies, Navistar International, University of Minnesota, 3M, Minnesota State Patrol

Start Date: November 1999

***End Date*:** December 2002

Estimated Total ITS Funds: $3,886,000

Estimated Total Project Cost: $6,550,000

***Contacts*:**

Randy VanGorder	FHWA - TFHRC, HRDO-03	(202) 493-3266

HAPTIC DISPLAYS FOR FORWARD COLLISION WARNING SYSTEMS

Description: This project is a human factors study to evaluate haptic display characteristics that would make them effective in warning drivers of imminent crashes. Haptic displays are ones that are felt by the driver rather than heard or seen. Examples include steering wheel vibration and brief brake pulses. An experiment was conducted to assess drivers' acceptance of alternative haptic displays and the manner in which drivers take control of the vehicle to avoid a collision with a vehicle or obstacle ahead. Drivers' behavior and reactions to forward collision avoidance systems (FCAS) in general, and the haptic feedback specifically, were recorded using an instrumented vehicle. Questions such as whether haptic feedback is beneficial and elicits appropriate driver responses in terms of crash avoidance and whether drivers are comfortable with the manner in which the FCAS takes control of the vehicle were assessed.

Project Location: East Liberty, Ohio

Contractor(s): Vehicle Research and Test Center

Start Date: July 1999

***End Date*:** April 2000

Estimated Total ITS Funds: $150,000

Estimated Total Project Cost: $150,000

***Contacts*:**

Michael Perel	NHTSA Headquarters, NRD-13	(202)366-5675

HEAD UP DISPLAY (HUD): DRIVER AGE AND VISUAL INTERFERENCE CONCERNS

Description: This project investigated experimental data on the ability of younger and older drivers to respond to safety-relevant roadway objects when using HUDs.

Project Location: Lansdale, Pennsylvania

Contractor(s): Scientex Corp.

Start Date: August 1994

***End Date*:** September 1998

Estimated Total ITS Funds: $290,000

Estimated Total Project Cost: $290,000

***Contacts*:**

Michael Perel	NHTSA Headquarters, NRD-13	(202) 366-5675

HEAVY VEHICLE INTELLIGENT DYNAMIC STABILITY ENHANCEMENT SYSTEMS

Description: The purpose of this project was to develop stability-enhancing systems for heavy trucks to reduce the incidence of vehicle rollover. The first product was a rollover warning system to be developed for a typical tractor-trailer, and will display to the driver how close to the rollover threshold the vehicle is being operated. The second product was a rearward amplification suppression system for multiple-trailer trucks. This system applied individual brakes on the vehicle to improve the stability and prevent trailer rollovers during vehicle maneuvers that typically excite the trailers in lateral acceleration.

Project Location: Ann Arbor, Michigan

Contractor(s): University of Michigan Transportation Research Institute (UMTRI)

Start Date: June 1995

***End Date*:** September 1998

Estimated Total ITS Funds: $895,000

Estimated Total Project Cost: $1,321,876

***Contacts*:**

Jim Britell	NHTSA Headquarters, NRD-13	(202) 366-5678

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 provided 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 provided the foundation for the future advancement of AHS objectives.

This project included 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, were developed. These scenarios were used as the basis for analytic and empirical research investigations addressing broad AHS human factors issues. In an iterative process, data from these efforts was used to refine and revise the scenarios. The refined scenarios formed the basis for a second set of empirical research investigations, addressing more detailed, system-specific AHS human factors issues. The culmination of these efforts was an AHS Human Factors Handbook for AHS Designers and Driver-based AHS Human Factors System and Development Guidelines.

Project Location: Minnesota and Iowa

Contractor(s): Honeywell, Inc.

Start Date: October 1992

***End Date*:** May 1998

Estimated Total ITS Funds: $5,266,140

Estimated Total Project Cost: $5,266,140

***Contacts*:**

Elizabeth Alicandri	FHWA - TFHRC, HRDS-07	(202) 493-3367

HUMAN FACTORS IN ATIS AND CVO DESIGN EVOLUTION

Description:

The objective of this contract was to develop precise and detailed human factors guidelines for in-vehicle Advanced Traveler Information Systems (ATIS) for both private and commercial ITS applications. The effort consisted of three phases: analytic, empirical, and integrative. The analytic phase was accomplished by examining in-vehicle driver and CVO operator requirements and human factors issues within the context of in-vehicle routing and navigation systems, motorist information services, safety advisory and warning systems, and in-vehicle signing systems. Results were documented in publications that addressed current literature, ATIS/CVO performance requirement, ATIS and CVO functional descriptions and task analysis, and comparable systems analysis and alternative systems. The empirical phase used a systematic approach to select 11 issues to study from a list of 91 candidates issues developed from the analytic phase. Research issues considered to be most important and studied include: driver acceptance; the effects of inaccurate traffic information; transitioning between ATIS functions; fatigue; driver workload; the benefits of multimodal displays; driver response to unexpected situations; the effects of reduced visibility conditions and the effects of safety and warning systems on driver behavior. These experiments are being described in FHWA publications. The product of the integrative phase consists of the final version of the guideline document containing 75 guidelines. This guideline document represents the culmination of the work accomplished in all three phases.

Project Location: Washington State

Contractor(s): Battelle Human Affairs Research Center

Start Date: October 1992

***End Date*:** May 1999

Estimated Total ITS Funds: $5,738,525

Estimated Total Project Cost: $5,738,525

***Contacts*:**

Joseph Moyer	FHWA - TFHRC, HRDS-07	(202) 493-3370

HUMAN FACTORS REQUIREMENTS FOR SIDE OBJECT DETECTION WARNING SYSTEMS

Description: This program collected human factors data to support the development of recommendations for the information display characteristics of side object detection/warning systems.

Project Location: Seattle, Washington

Contractor(s): Battelle Memorial Institute

Start Date: January 1995

***End Date*:** December 1996

Estimated Total ITS Funds: $450,000

Estimated Total Project Cost: $450,000

***Contacts*:**

Michael Perel	NHTSA Headquarters, NRD-13	(202) 366-5675

HUMAN FACTORS STUDIES FOR THE EVALUATION, ANALYSIS, AND OPERATIONAL ASSESSMENT OF AN INTELLIGENT CRUISE CONTROL SYSTEM

Description: This program addressed a range of human factors issues associated with implementation of Intelligent Cruise Control (ICC) systems. These issues included: (1) driver usability in terms of ease of learning ICC operation; (2) driver reaction to the ICC limits, for maximum deceleration and acceleration and minimum headway; (3) driver attention and response to braking situations.

Project Location: Dearborn, Michigan

Contractor(s): Ford Motor Company

Start Date: September 1994

***End Date*:** June 1999

Estimated Total ITS Funds: $900,000

Estimated Total Project Cost: $1,744,057

***Contacts*:**

Michael Perel	NHTSA Headquarters, NRD-13	(202) 366-5675

IN-VEHICLE CRASH AVOIDANCE WARNING SYSTEM - HUMAN FACTORS CONSIDERATIONS

Description: This project addressed the development of human factors guidelines for in-vehicle warning systems. The focus of this project was on the development of human factors guidelines to ensure that the design of in-vehicle crash avoidance warning systems is compatible with driver capabilities, limitations and needs. Human factors data were collected to determine desirable human interface requirements for rear object crash warning systems.

Project Location: Silver Spring, Maryland

Contractor(s): COMSIS, Inc.

Start Date: September 1991

***End Date*:** September 1996

Estimated Total ITS Funds: $953,000

Estimated Total Project Cost: $953,000

***Contacts*:**

Michael Perel	NHTSA Headquarters, NRD-13	(202) 366-5675

IN-VEHICLE DISPLAY ICONS AND OTHER INFORMATION ELEMENTS

Description: The objective of this study was to develop analytically and empirically based design guidelines for in-vehicle icons. An extensive literature review of previous research related to icons was conducted as well as a preliminary assessment of visual symbols for in-vehicle systems. The preliminary design guidelines have been completed and the empirical phase is nearing completion. The preliminary design guidelines have been developed. This effort included the input of a working group consisting of automotive and electronic designers, human factors professionals, and researchers. The resulting design guidelines from this work fed directly into In-Vehicle Information Systems display guidelines such as FHWA's ATIS/CVO Design Guidelines. Funding was added to develop an interactive software-based tool that can be used by icon developers to: evaluate basic characteristics of an icon; access the collection of approximately 400 icons with associated ratings/evaluations; and access comprehensive evaluations for approximately 100 selected icons.

Project Location: Seattle, Washington

Contractor(s): Battelle, Transportation Research Center

Start Date: October 1997

***End Date*:** June 2002

Estimated Total ITS Funds: $1,147,403

Estimated Total Project Cost: $1,147,403

***Contacts*:**

Tom Granda	FHWA - TFHRC, HRDS-07	(202) 493-3365

IN-VEHICLE INFORMATION SYSTEMS BEHAVIORAL MODEL AND DESIGN SUPPORT

Description: The In-Vehicle Information System (IVIS) Behavioral Model and Design Support System included a set of design tools to assist in the design of an IVIS and a driver behavioral model to assess candidate IVIS. The behavioral model is capable of taking IVIS design specifications and producing a prediction of driving behavior while using them. The design support system is comprised of a set of human factors tools to be used in the design of in-vehicle information systems. The development of the IVIS Behavioral Model and Design Support System required empirical research, analysis, and documentation of the design process for in-vehicle information systems. The behavioral model and the design support system were implemented as a prototype software program and are viewed as a demonstration of the feasibility of the concept. The systems specification and Human Computer Interface Specification were submitted to FHWA for review shortly prior to the end date listed below.

Project Location: Blacksburg, Virginia

Contractor(s): Virginia Tech Transportation Institute

Start Date: September 1996

***End Date*:** March 2000

Estimated Total ITS Funds: $963,537

Estimated Total Project Cost: $963,537

***Contacts*:**

Joseph Moyer	FHWA - TFHRC, HRDS-07	(202) 493-3370

IN-VEHICLE SAFETY ADVISORY AND WARNING SYSTEMS (IVSAWS)

Description:

The In-Vehicle Safety Advisory and Warning System is a Federal Highway Administration program to develop a nationwide vehicle information system that provides drivers with advance, supplemental notification of dangerous road conditions using electronic warning zones with precise areas of coverage. Extensive market investigation with the public and safety professionals revealed that while they both liked the IVSAWS concept, safety professionals wanted maximum compatibility with existing procedures, and motorists were concerned with avoiding false alarms. The operational concept selected uses centralized broadcasts from a regional IVSAWS operations center. Systems design analysis showed that an electronic warning zone with a specific area of coverage is the proper means to guarantee relevant alerts. Furthermore, a geolocation capability is the cost-effective means for implementing these electronic warning zones. Two candidates were selected which are compatible with centralized broadcasts and available geolocation systems.

Project Location: Fullerton, California

Contractor(s): Hughes Ground Systems Group

Start Date: September 1990

***End Date*:** March 1995

Estimated Total ITS Funds: $750,000

Estimated Total Project Cost: $987,500

***Contacts*:**

Pete Mills	FHWA - TFHRC, HRDS-06	(202) 285-2974

INTELLIGENT CRUISE CONTROL FIELD OPERATIONAL TEST

Description: The field operational test serves as a bridge between research and development and deployment. The performance and user acceptance of a system that permits a vehicle to maintain automatically a safe level of speed and distance between it and preceding vehicles were tested and evaluated on a fleet of vehicles.

Project Location: Michigan

Partner(s): The Regents of the University of Michigan Transportation Research Institute (UMTRI), Michigan DOT, Leica AG (now A.D.C. GmbH), and Haugen Associates

Start Date: September 1995

***End Date*:** September 1999

Estimated Total ITS Funds: $3,010,498

Estimated Total Project Cost: $3,874,121

***Contacts*:**

August Burgett	NHTSA Headquarters, NRD-12	(202) 366-5672

INTERSECTION COLLISION AVOIDANCE USING ITS COUNTERMEASURES

Description: Performance requirements (both hardware and human factors) for advanced technology systems to assist drivers in avoiding intersection crashes. This project led to the development of performance specifications (both hardware and human factors) for advanced technologies to improve crash avoidance of vehicles negotiating intersections. This project addressed autonomous vehicle-based systems, vehicle-vehicle communication systems, and/or cooperative highway-vehicle systems requiring instrumentation of intersections.

Project Location: New York and Ohio

Contractor(s): CALSPAN Corporation

Start Date: October 1993

***End Date*:** September 1999

Estimated Total ITS Funds: $4,676,000

Estimated Total Project Cost: $4,825,585

***Contacts*:**

Arthur Carter	NHTSA Headquarters, NRD-12	(202) 366-5669

IVI DRIVER DISTRACTION RESEARCH

Description: This research project was aimed at quantifying and managing device attention demands through real-time adaptive interfaces. NHTSA is developing evaluative metrics that are closely tied to the distraction causality leading to crash and near-crash situations. These metrics will be developed using instrumented vehicles and simulator experiments to measure the additional demands of information system interfaces and of various driving tasks. This research effort was used to determine how to use this data to determine specifications to adapt driver interfaces in real-time to minimize distraction demands.

Project Location: East Liberty, Ohio

Contractor(s): Vehicle Research and Test Center

Start Date: June 2001

***End Date*:** June 2002

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Mike Perel	NHTSA Headquarters, NRD-13	(202) 366-5675

LANE CHANGE/MERGE NATURALISTIC PILOT STUDY

Description: The purpose of this project was to collect data that captures specific driver behavior and performance related to lane changes involving vehicle conflict conditions. Project participants drove to and from work in instrumented vehicles over a period of four weeks. The project environment included interstate highways and divided highways with lower speed limits. Project vehicles were Ford Tauruses and Ford Explorers. Collected data include signaling, braking, lane positioning, lane change measures, headways, tailways (including adjacent lane vehicle range and range rate) and driver glance behavior.

Project Location: Blacksburg, Virginia

Contractor(s): Virginia Polytechnic Institute and State University, Virginia Tech Transportation Institute

Start Date: October 2000

***End Date*:** October 2002

Estimated Total ITS Funds: $1,000,000

Estimated Total Project Cost: $1,000,000

***Contacts*:**

Mike Goodman	NHTSA Headquarters, NRD-52	(202) 366-5677

LANE KEEPING AND ROAD DEPARTURE ALERTING

Description: The purpose of this project was to develop the means and methods for specifying an alerting system responsive to conditions ranging from lane keeping awareness through imminent road departure warning. Subsequent to a literature and technology review, the project developed measures of effectiveness and performance, and quantitative models capable of extending the limitations of current systems in order to specify an optimal system. The project worked in concert with parallel efforts underway at the National Institute of Standards and Technology and the Volpe National Transportation Systems Center.

Project Location: Ames, Iowa

Contractor(s): University of Iowa

Start Date: January 2001

***End Date*:** June 2002

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Paul Rau	NHTSA Headquarters, NRD-13	(202) 366-0418
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

NATIONAL AUTOMATED HIGHWAY SYSTEM CONSORTIUM

Description: The National AHS Consortium successfully demonstrated the feasibility of both partially and fully automated vehicle-highway systems at Demo '97, on I-15 in San Diego. Building on this, the consortium worked within the framework of the new USDOT Intelligent Vehicle Initiative (IVI), to provide guidance on the potential contribution of cooperative (vehicle-vehicle and vehicle-infrastructure) concepts for providing IVI services vs. autonomous vehicle concepts. The research results, and recommendations for future research were presented in a workshop in April 1998.

Project Location: Troy, Michigan (NAHSC Program Office)

Contractor(s): The NAHSC Consortium

Start Date: November 1994

***End Date*:** September 1998

Estimated Total ITS Funds: $58,200,000

Estimated Total Project Cost: $58,200,000

***Contacts*:**

Robert Ferlis	FHWA - TFHRC, HRDO-04	(202) 493-3268

NHTSA ALERT ALGORITHM DEVELOPMENT

Description: The purpose of this project was to translate the NHTSA automotive rear-end collision avoidance algorithm from PC-based software simulations and analytical models to tested, debugged and documented C++ source code. The code is to be delivered to General Motors for simulation testing, integration with other executable software for use in vehicle-level testing, and for use in a field operational test.

Project Location: Laurel, Maryland

Contractor(s): Johns Hopkins University Applied Physics Laboratory

Start Date: September 1999

***End Date*:** December 2001

Estimated Total ITS Funds: $450,000

Estimated Total Project Cost: $450,000

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

NIGHT DRIVER THERMAL IMAGING CAMERA AND HEAD UP DISPLAY DEVELOPMENT PROGRAM FOR CRASH AVOIDANCE

Description: The focus of this cooperative agreement was to investigate new methods and technologies related to the development of automotive head-up-displays (HUD), and to develop an improved, production-realistic prototype HUD capable of supporting night driving applications, and operating reliably in the automotive environment.

Project Location: Dallas, Texas

Contractor(s): Raytheon, Texas Instruments Systems (RTIS)

Start Date: September 1997

***End Date*:** June 2000

Estimated Total ITS Funds: $346,340

Estimated Total Project Cost: $698,680

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

OPERATIONAL REVIEW OF SPECIALTY VEHICLE

Description: The objectives of this study were to:

- Perform a preliminary needs assessment for Specialty Vehicles.
- Perform a baseline comparison of the ALERT system with conventional police vehicles.
- Develop a set of potential enhancement to the ALERT system with the goal of making the performance of the driver-vehicle unit safer and more efficient.
- To develop interface recommendations and lessons learned for law enforcement in-vehicle information systems.

The draft final design recommendations and lessons learned for the ALERT System and for law enforcement in-vehicle information systems have been completed.

Project Location: Virginia

Contractor(s): Virginia Tech Transportation Institute

Start Date: October 1998

***End Date*:** February 2002

Estimated Total ITS Funds: $431,871

Estimated Total Project Cost: $431,871

***Contacts*:**

Joseph Moyer	FHWA - TFHRC, HRDS-07	(202) 493-3370

PATH COOPERATIVE AVCSS RESEARCH PROGRAM

Description: This program was a cooperative agreement between FHWA, CalTrans, and PATH for the research of vehicle-follower longitudinal control technologies. The program was divided into three major work areas: (1) sensor technologies, (2) vehicle-to-vehicle communications, and (3) vehicle-follower longitudinal control. The vehicle-follower work area was further researched in the following areas: system performance and test specifications, braking actuators technology, hardware computing platforms, operating system, control software development, and testing of vehicle-follower longitudinal control systems.

Project Location: Richmond, California

Partner(s): Partners for Advanced Transit and Highway (PATH)

Start Date: October 1994

***End Date*:** March 1997

Estimated Total ITS Funds: $1,275,000

Estimated Total Project Cost: $2,500,000

***Contacts*:**

Robert Ferlis	FHWA - TFHRC, HRDO-04	(202) 493-3268

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

Description: This project resulted in the development of performance requirements (both hardware and human factors) for advanced technologies to improve crash avoidance during lane change, merging and backing maneuvers. This project was designed for countermeasure systems that will be self-contained within the vehicle. However, the project design 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.

Project Location: California and Texas

Contractor(s): Interagency agreement with Defense Microelectronics Activity; work conducted by TRW

Start Date: September 1997

***End Date*:** June 2000

Estimated Total ITS Funds: $2,312,000

Estimated Total Project Cost: $2,312,000

***Contacts*:**

Dave Smith	NHTSA Headquarters, NRD-51	(202) 366-5674

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

Description: This project led 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. This project was designed for countermeasure systems that will be self-contained within the vehicle. However, it did 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.

Project Location: California and Texas

Contractor(s): Interagency agreement with U.S. Air Force; work conducted by TRW.

Start Date: July 1993

***End Date*:** December 1999

Estimated Total ITS Funds: $2,378,000

Estimated Total Project Cost: $2,378,000

***Contacts*:**

Dave Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

PERFORMANCE SPECIFICATIONS: COUNTERMEASURES AGAINST REAR-END COLLISIONS

Description: This project led to the development of performance requirements (both hardware and human factors) for advanced technologies to prevent or decrease the severity of rear-end crashes. This project was 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.

Project Location: Arizona and Iowa

Contractor(s): Sensor Technologies & Systems, Inc. (formerly Frontier Engineering, Inc.)

Start Date: May 1993

***End Date*:** October 1998

Estimated Total ITS Funds: $4,430,773

Estimated Total Project Cost: $4,430,773

***Contacts*:**

Art Carter	NHTSA Headquarters, NRD-12	(202) 366-5669

PERFORMANCE SPECIFICATIONS: COUNTERMEASURES AGAINST ROADWAY DEPARTURE COLLISIONS

Description: This project led 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 was designed for countermeasure systems that will be self-contained within the vehicle. However, it did 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.

Project Location: Pittsburgh, Pennsylvania; Columbus, Ohio; and Buffalo, New York

Contractor(s): Carnegie Mellon University

Start Date: September 1993

***End Date*:** November 1999

Estimated Total ITS Funds: $4,678,325

Estimated Total Project Cost: $4,678,325

***Contacts*:**

Lloyd Emery	NHTSA Headquarters, NRD-12	(202) 366-5673

PORTABLE HUMAN FACTORS DATA ACQUISITION SYSTEM FOR CRASH AVOIDANCE RESEARCH (DASCAR)

Description: The objectives of this project were 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 covered Phase I, which recommended system design and software specifications.

Project Location: Oak Ridge, Tennessee

Contractor(s): Oak Ridge National Laboratory

Start Date: September 1992

***End Date*:** December 1995

Estimated Total ITS Funds: $1,198,000

Estimated Total Project Cost: $1,198,000

***Contacts*:**

Michael Goodman	NHTSA Headquarters, NRD-52	(202) 366-5677

PRELIMINARY HUMAN FACTORS REVIEW OF INTELLIGENT VEHICLE INITIATIVE (IVI)

Description:

The objective of this activity was to establish the human factors research needs for the near-term intelligent vehicles in the Intelligent Vehicle Initiative (IVI). This project included the solicitation of input from stakeholders and researchers, and consensus building for the design of human-centered IVI vehicles. In this study, preliminary infrastructure and in-vehicle architecture requirements for IVI Generation 1, 2, and 3 vehicles (with emphasis on Generation 1) were identified and analyzed. This analysis primarily included the needs for passenger cars, and to a lesser extent the needs for trucks, buses, and emergency/special vehicles. Twenty-six User Services were grouped into seven technology modules which were combined to create five candidate configurations for IVI vehicles. The requirements for infrastructure, vehicle, and human factors research for each candidate configuration were documented. A final report and six flyers were generated and are currently available through HRDS.

Project Location: Columbus, Ohio

Contractor(s): Battelle, Human Affairs

Start Date: September 1997

***End Date*:** August 1998

Estimated Total ITS Funds: $350,000

Estimated Total Project Cost: $350,000

***Contacts*:**

Joseph Moyer	FHWA - TFHRC, HRDS-07	(202) 493-3370

PROBLEM DEFINITION AND ANALYSIS OF TARGET CRASHES AND ITS COUNTERMEASURE ACTIONS

Description: This project addressed an analytical methodology for defining, analyzing, and modeling target crashes and ITS/crash avoidance countermeasure action for use in establishing research priorities and/or assessing potential safety benefits. This project has developed an analytical methodology for defining, analyzing, and modeling target crashes and ITS/crash avoidance countermeasure action for the purpose of assessing potential effectiveness and identifying R&D priorities and/or assessing potential safety benefits. 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.

Project Location: Columbus, OH

Contractor(s): Battelle, CALSPAN, Castle Rock

Start Date: August 1991

***End Date*:** April 1995

Estimated Total ITS Funds: $1,877,000

Estimated Total Project Cost: $1,877,000

***Contacts*:**

Duane Perrin	NHTSA Headquarters, NRD-13	(202) 366-5664

PROTOTYPE HEAVY VEHICLE DROWSY DRIVER DETECTION AND WARNING SYSTEM

Description: This project developed, tested, and evaluated a prototype in-vehicle continuous driver alertness monitoring/drowsiness detection system for heavy trucks. System drowsiness detection algorithms and warning signals were derived primarily from the findings of the Driver Status/Performance Monitoring program. Based on the prototype design and lessons learned from the test and evaluation, a system functional performance specification was developed.

Project Location: Pittsburgh, Pennsylvania

Contractor(s): Carnegie Mellon Research Institute

Start Date: July 1995

***End Date*:** September 1998

Estimated Total ITS Funds: $2,085,000

Estimated Total Project Cost: $2,085,000

***Contacts*:**

Paul Rau	NHTSA Headquarters, NRD-13	(202) 366-0418

PUGET SOUND HELP ME (PUSHME) MAYDAY SYSTEM

Description: The primary objective of this project was to assess operational, institutional and technology requirements for implementing a regional MAYDAY system that would allow a driver to send an immediate notification of an incident, its location and need for assistance to a response center.

Project Location: Puget Sound (Northwest Washington State) region

Partner(s): Washington State DOT, Washington State Patrol, David Evans and Associates, Motorola, IBI Group, Sentinel Communications, Response Systems Partners, and University of Washington

Start Date: August 1994

***End Date*:** September 1997

Estimated Total ITS Funds: $1,400,000

Estimated Total Project Cost: $2,500,000

***Contacts*:**

Michael Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Pete Briglia	Washington State DOT	(206) 543-3331

REAR-END CRASH AVOIDANCE SYSTEM ALGORITHMS AND ALERTING STRATEGIES (ALGORITHM VERIFICATION)

Description: The purpose of this project was to provide an evaluation of the effects of Rear-End Crash Avoidance System warning algorithm parameters on the driver's crash avoidance performance in rapid deceleration scenarios. The project conducted simulator-based studies of the effects of warning signal algorithm parameters on driver performance. The final product includes recommendations for earning algorithm characteristics as well as auditory and visual warning displays based on experimental testing in a driver simulator.

Project Location: Ames, Iowa

Contractor(s): University of Iowa

Start Date: September 1998

***End Date*:** September 2001

Estimated Total ITS Funds: $374,535

Estimated Total Project Cost: $374,535

***Contacts*:**

Michael Perel	NHTSA Headquarters, NRD-13	(202) 366-5675
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

RESEARCH AND TECHNOLOGY REVIEW FOR DRIVER VISION ENHANCEMENT SYSTEMS

Description: This project conducted a state-of-the-art review of research and technologies which are relevant to proposed and future driver vision enhancement systems.

Project Location: Pittsburgh, Pennsylvania

Contractor(s): Carnegie Mellon Research Institute (CMRI)

Start Date: January 1994

***End Date*:** August 1994

Estimated Total ITS Funds: $100,000

Estimated Total Project Cost: $100,000

***Contacts*:**

Jack Ference	NHTSA Headquarters, NRD-12	(202) 366-0168

REVIEW OF SOCIETAL AND INSTITUTIONAL FACTORS FOR THE INTELLIGENT VEHICLE INITIATIVE

Description: This project identified impacts of the deployment of intelligent vehicle services on society. Specific institutional barriers, including product liability concerns and necessary changes to vehicle insurance coverage, were defined and solutions recommended. Critical issues related to the role of transportation infrastructure providers were analyzed.

Project Location: New York, New York

Contractor(s): Parsons Brinkerhoff

Start Date: November 1998

***End Date*:** December 1999

Estimated Total ITS Funds: $200,000

Estimated Total Project Cost: $200,000

***Contacts*:**

Robert Ferlis	FHWA - TFHRC, HRDO-04	(202) 493-3268

SAFETY EVALUATION OF TRAVTEK OPERATIONAL TEST

Description: This project conducted a safety assessment of operational test of traffic route guidance and navigation system.

Project Location: McLean, Virginia

Contractor(s): SAIC

Start Date: September 1991

***End Date*:** June 1995

Estimated Total ITS Funds: $450,000

Estimated Total Project Cost: $450,000

***Contacts*:**

August Burgett	NHTSA Headquarters, NRD-12	(202) 366-5672

STANDARDIZED DRIVING SIMULATION TASKS AND SCENARIOS

Description: The objective of this NHTSA project was 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 were derived from predominant driving patterns and crash types, and will be used in advanced driving simulators, including the National Advanced Driving Simulator (NADS).

Project Location: Iowa City, Iowa

Contractor(s): University of Iowa

Start Date: September 1993

***End Date*:** September 1995

Estimated Total ITS Funds: $400,000

Estimated Total Project Cost: $400,000

***Contacts*:**

Duane Perrin	NHTSA Headquarters, NRD-13	(202) 366-5664

SYSTEM FOR ASSESSMENT OF VEHICLE MOTION ENVIRONMENT (SAVME)

Description: This project developed VME prototype hardware and software. Primary project objectives included developing and validating a measurement system that can quantify the specific crash avoidance motions that vehicles exhibit as they move in traffic under the full array of traffic operations. Included among the software/hardware configurations are optical sensors placed 100 feet above a traffic scene integrated with computer processing to obtain information on vehicle trajectories such as speed, lane changes, congested traffic following, intersection traversal and lane keeping. This technology will provide a database for near-miss situations which is critical in the development and evaluation of crash avoidance technologies.

Project Location: Michigan

Contractor(s): University of Michigan Transportation Research Institute (UMTRI) and ERIM

Start Date: September 1992

***End Date*:** August 2000

Estimated Total ITS Funds: $1,697,073

Estimated Total Project Cost: $2,235,000

***Contacts*:**

Arthur Carter	NHTSA Headquarters, NRD-12	(202) 366-5669

SYSTEM FOR ASSESSMENT OF VEHICLE MOTION ENVIRONMENT PILOT TEST 1

Description: The project developed and validated 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 support of intersection crash avoidance research. In subsequent projects, the measurement system will be used to gather information such as reaction to other drivers cutting in front, normal following distance, and typical lane change trajectories to create a foundation for development of ITS countermeasures that identify the need for intervention.

Project Location: Columbus, Ohio

Contractor(s): Vehicle Research and Test Center

Start Date: September 2000

***End Date*:** December 2002

Estimated Total ITS Funds: $500,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Kerrin Bressant	NHTSA Headquarters, NRD-12	(202) 366-1110
David Smith	NHTSA Headquarters, NRD-12	(202) 366-5674

TECHNICAL SUPPORT FOR IVIS DEVELOPMENT AND OPERATIONAL TEST

Description: This project was initially titled "Development of An In-Vehicle Information System," and involved the technologies and issues associated with in-vehicle signing systems. It was expanded to include evaluations of an in-vehicle information system for handling all sources of information that may be presented within the vehicle. Completed tasks include reports on "Functional Requirements Specification for an In-Vehicle Information System," "In-Vehicle Information System Concepts," "Cost of In-Vehicle Information Systems and Associated Infrastructure," and "In-Vehicle Information Communication Protocol." A platform is being developed to operationally test new in-vehicle devices which can include routing and navigation, real-time traffic, motorist services, and collision avoidance subsystem. Four workshops have been held.

Project Location: Oak Ridge, Tennessee

Contractor(s): Oak Ridge National Laboratory

Start Date: June 1994

***End Date*:** November 1999

Estimated Total ITS Funds: $2,062,500

Estimated Total Project Cost: $2,062,500

***Contacts*:**

Dr. Sam Tignor	FHWA - TFHRC, HRDS-03	(202) 493-3363

TRANSIT LANE CHANGE/MERGE (LC/M) (SIDE) PERFORMANCE SPECIFICATION

Description: This project built on previous, and on-going NHTSA efforts in developing foundational performance specifications for light vehicle lane change collision avoidance systems. The light vehicle lane change collision avoidance specifications (completed in FY 1999) did not address transit vehicle characteristics, the operating environment, driver capabilities, weather impacts, and driver inattention. This project developed and evaluated performance specifications for transit buses including driver-vehicle interface (DVI) design guidelines, and objective test procedures. In FY 2001, another amendment was added to the program to continue working on the side collision warning system as part of an Integrated Forward and Side Collision Warning Program. The project team for this activity is partnered with the forward collision warning team, and has developed an integrated collision warning system specification. Validation testing has also been conducted. A one-year field operational test of the system using one hundred transit buses is in-progress during late 2002 in Pittsburgh, Pennsylvania. The planned integration date is December 2004.

Project Location: Pittsburgh, Pennsylvania

Contractor(s): Pennsylvania DOT, Port Authority of Allegheny County (Pittsburgh Transit Agency) Carnegie Mellon University

Start Date: May 1999

***End Date*:** June 2002

Estimated Total ITS Funds: $950,000

Estimated Total Project Cost: $1,900,000

***Contacts*:**

Brian Cronin	FTA Headquarters, TRI-11	(202) 366-8841

TRANSIT REAR END (FORWARD) PERFORMANCE SPECIFICATIONS

Description: This project built on previous NHTSA efforts on developing foundational performance specifications for light vehicle rear end collision avoidance systems which did not address transit vehicle characteristics and the transit operating environment. This project developed a forward collision avoidance system that warns drivers of an impending collision with the vehicle ahead. The system has been installed on two San Mateo, CA Transit System buses and is being evaluated by the California Department of Transportation and PATH. The planned integration date is December 2004.

Project Location: San Mateo County, California

Contractor(s): Calfiornia DOT (CalTrans), San Mateo County Transit

Start Date: December 1999

***End Date*:** July 2002

Estimated Total ITS Funds: $1,100,000

Estimated Total Project Cost: $1,100,000

***Contacts*:**

Brian Cronin	FTA Headquarters, NRD-11	(202) 366-8841
Frank Cechini	FHWA California Division, HTA-CA	(914) 498-5005

VARIABLE DYNAMIC TEST VEHICLE DEVELOPMENT

Description: A computer-controlled variable subsystems, drive-by-wire (steering, braking, throttle) and four-wheel steering testbed vehicle was developed. The VDTV is used by NHTSA to support the ITS crash avoidance and the Intelligent Vehicle Initiative as appropriate.

Project Location: Pasadena, California

Contractor(s): Jet Propulsion Laboratory

Start Date: August 1995

***End Date*:** September 1999

Estimated Total ITS Funds: $3,952,200

Estimated Total Project Cost: $3,952,200

***Contacts*:**

Lloyd Emery	NHTSA Headquarters, NRD-12	(202) 366-5673

VEHICLE FEEDBACK CUES AND DRIVER PERFORMANCE

Description: This project identified and analyzed vehicle feedback cues which most influence a driver's safety-relevant behavior and performance. Additionally, the project developed evaluation protocols and performance specifications for technology that affects feedback cues that drivers use to control the vehicle.

Project Location: Michigan

Contractor(s): University of Michigan Transportation Research Institute (UMTRI)

Start Date: September 1992

***End Date*:** October 1995

Estimated Total ITS Funds: $150,000

Estimated Total Project Cost: $150,000

***Contacts*:**

Duane Perrin	NHTSA Headquarters, NRD-13	(202) 366-5664

VEHICLE-BASED LANE DETECTION

Description: This program is a cooperative agreement with Rockwell International to conduct a two-year field evaluation of a prototype machine vision lane detection sensor. Sensor performance was evaluated under various operating conditions and general lane detection sensor performance requirements were identified. Estimation of future vehicle position is key capability that will be an integral part of collision avoidance and automatic vehicle control systems. No viable technology to perform this function reliably and inexpensively is currently commercially available. The TASK 1 system validation effort has been completed.

Project Location: Anaheim, California

Contractor(s): Rockwell International

Start Date: April 1994

***End Date*:** October 1996

Estimated Total ITS Funds: $824,733

Estimated Total Project Cost: $824,733

***Contacts*:**

Lloyd Emery	NHTSA Headquarters, NRD-12	(202) 366-5673

VIII. EVALUATION/PROGRAM ASSESSMENT

VIII. EVALUATION/PROGRAM ASSESSMENT

Program evaluation is critical to ensuring progress toward the vision of integrated intelligent transportation systems and achieving deployment goals. Evaluation is indispensable to an understanding of the value, effectiveness and impacts of ITS Program activities. Equally important, evaluation allows for continual refinement of the Program. The ITS Program has undertaken assessment activities to satisfy these needs, and to use the Government Performance and Results Act to help ensure that the Program is effective in meeting the Government's higher-level transportation goals. To further these objectives, the following are included in activities that have been undertaken:

- Tracking ITS infrastructure by establishing a baseline of existing ITS deployments throughout the nation's metropolitan areas and updating this information through national surveys conducted in 1996, 1997, 1999, 2000, and 2002. Beginning in 2002, the surveys will be conducted bi-annually, and the data gathering has been expanded to include coverage of tourist and statewide/rural ITS deployments.

- Evaluating the effectiveness and benefits versus costs of ITS infrastructure deployed and integrated at the metropolitan and CVISN model deployment sites, as well as at field operational tests addressing ITS applications in areas such as intermodal freight, rural infrastructure – to include deployments in National Parks – and weather – related settings. Other evaluation activities focus on innovative transit-related ITS applications and emerging regional electronic fare payment systems.

- Documenting evaluation results emerging from the implementation of ITS user services and the benefits these services provide to the surface transportation system. An ITS Benefits Database has been established, and a reference report (Intelligent Transportation Systems Benefits) is produced annually, which provides a snapshot of the information in this database. The online database is updated more frequently than the report, and provides more details on specific references. The ITS Benefits and Unit Costs Database is accessible at www.benefitcost.its.dot.gov.

- Conducting independent evaluations (also referred to as national, or JPO-sponsored, evaluations) of selected ITS deployment and/or integration projects undertaken with Congressionally directed funding.

Evaluation. The most effective ITS evaluation activities are those that are intertwined with ITS projects throughout their life cycle. A principal benefit of evaluation is early participation of independent evaluators with project teams to ensure clear identification of the project goals and objectives, standards for successful performance, and measures of effectiveness agreed to by the project partners or project teams. Because evaluation is inherent to successful performance of any program, evaluation efforts (e.g., as part of research and development, field operational tests, mainstreaming, and architecture and standards work) are included as part of other sections of this projects report. Projects listed in this section are those that concentrate upon evaluations, or improving evaluation methods. With the selection of the four Metropolitan ITS Model

Deployment sites and the initiation of the eight-state CVISN Pilot Projects, special emphasis was placed on the evaluation of these projects by the ITS Joint Program Office (JPO). Moreover, future field operational tests will be evaluated by the ITS JPO. These evaluations are being provided through two parallel ITS Program Assessment Support (IPAS) contracts.

Program Assessment. Program assessment takes a global look at the U.S. ITS Program. Projects listed in this section of the ITS projects report focus on methods of integrating evaluation results to assess higher level program goals and objectives. Program assessment ultimately leads to investment strategies that must take an integrated look at program cost and effectiveness so that resources can be allocated to address the best solution approaches. Other projects listed in this section address methods for measuring ITS costs and benefits. The ITS Deployment Tracking Projects are the key activities dedicated to defining and tracking infrastructure deployment and integration to enable measurement of progress toward the U.S. Secretary of Transportation's deployment goals.

Finally, the Evaluation/Assessment Program results in a significant volume of reports which document the impacts and benefits of ITS at deployment and operational test sites. The ITS JPO Program Assessment activity is engaged in refining and transforming technical documentation into a stream of summary and more extensive reports, known as ITS Benefits Special Studies, for easy assimilation by decision-makers, planners, and implementers at the state and local levels of government and their private sector partners.

Research

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 are being 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 develop a national set of insights across different site conditions.

Project Location: Cambridge, Massachusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: October 1994

***End Date*:** April 2003

Estimated Total ITS Funds: $3,722,000

Estimated Total Project Cost: $3,722,000

***Contacts*:**

Terrell Williams	FTA Headquarters, TRI-11	(202) 366-0232
Robert Casey	Volpe National Transportation Systems Center	(617) 494-2213

ITS PROGRAM ASSESSMENT SUPPORT (IPAS)

Description:

These are support contracts intended to provide ITS program assessment technical and program support in the following areas:

(1) Design, manage, implement, and support independent evaluations of the effectiveness of ITS projects, including Metropolitan and CVISN Model Deployments, and other ITS projects to include deployment and/or integration projects undertaken with TEA-21 earmarked funding under the ITS Integration Program. This activity also encompasses evaluation of a significant number of field operational tests addressing ITS services in application areas such as intermodal freight, hazardous materials transportation management, road weather information systems, emergency services and traveler information in national parks.

(2) Collect and analyze ITS performance, benefits, cost, economic, and program data. Data and information collected can be used to identify benefit/costs of ITS projects to support inclusion of ITS technology in state and local transportation problem solving.

(3) Synthesize the information produced in (2); evaluate the degree to which ITS policies and procedures have led to the achievement of current ITS costs, schedule, and performance goals; and provide yearly quantitative and qualitative inputs to the refinement of goals and the resultant Federal ITS investment strategy.

(4) Develop and refine the tools and information needed to support the JPO Program assessment and decision-making process.

These contracts were recompeted in 2002.

Project Location: Washington, DC; ITS Integration Program earmarked project sites, various field operational test sites.

Contractor(s): SAIC; Battelle Memorial Institute

Start Date: September 1996

***End Date*:** September 2007

Estimated Total ITS Funds: $37,513,963

Estimated Total Project Cost: $37,513,963

***Contacts*:**

Joe Peters	FHWA ITS JPO, HOIT	(202) 366-2202

METROPOLITAN ITS INFRASTRUCTURE DEPLOYMENT TRACKING

Description: The purpose of this project is to provide the ITS Joint Program Office feedback on the state of deployment and integration of ITS nationally. One use of this information is to track progress toward the U.S. DOT Operation Time Saver goal of deploying the integrated ITS infrastructure in 75 (subsequently expanded to 78) of the nation's largest metropolitan areas. In 2002, the scope of the project was expanded beyond the 78 major metropolitan areas to include coverage of tourist area and statewide/rural ITS deployment. To accomplish its purpose, the project team has developed deployment and integration indicators for each of the major ITS infrastructure components. These indicators compare the actual level of deployment or integration to the opportunity for deployment. To calculate these indicators, data are gathered from transportation agencies in the metropolitan, tourist, and statewide/rural areas within the scope of this project. The indicators are periodically updated through additional data gatherings to track change over time. To date, the indicators have been defined and have been applied using data from national data gathering surveys in 1996, 1997, 1999, 2000, and 2002. Results of the data gatherings through 2000 have been published in individual site reports for each metropolitan area, as well as a national summary. In addition, the data are posted at the ITS Deployment Tracking Website at http://www.itsdeployment.its.dot.gov. At the preparation of this report, the results of the 2002 data gathering were being verified and analyzed before being made available at the Website.

Project Location: Oak Ridge, Tennessee

Contractor(s): Oak Ridge National Laboratory

Start Date: October 1995

***End Date*:** December 2005

Estimated Total ITS Funds: $950,000

Estimated Total Project Cost: $950,000

***Contacts*:**

Joe Peters	FHWA ITS JPO, HOIT	(202) 366-2202

ORLANDO, FLORIDA LYNX LYMMO EVALUATION

Description:

In 1997, the Downtown Development Board, in partnership with the City of Orlando and the Central Florida Regional Transportation Authority (LYNX), instituted a new exclusive lane bus service known as "LYMMO." This service is intended to provide a Bus Rapid Transit (BRT) application to accomplish a number of public purposes, including continued downtown economic development, improved mobility, parking mitigation, and a pleasing pedestrian/transit environment. Following implementation of the service, ridership on the system shattered not only start-up projections, but also the most optimistic projects at full system maturity.

The FTA continually has promoted the need for better and more effective bus service in the transit industry. In 1998, the FTA issued grant opportunities for the demonstration and deployment of BRT systems in the U.S. The purpose of this study is to document and evaluate the LYNX LYMMO service as one of the newest applications of BRT in the U.S. The results of this study will not only benefit Central Florida and LYNX in identifying the current strengths, weaknesses, and potential areas of improvement for the system, it will also provide a model for the FTA and local communities to use when evaluating similar proposed projects. Once the technical documentation and objective evaluations have been conducted, LYNX will produce communications materials that will be available to highlight the components of this BRT application for the transit industry.

Project Location: Orlando, Florida

Contractor(s): Florida DOT, Central Florida Regional Transortation Authority (LYNX), University of South Florida, Center for Urban Transportation Research (CUTR)

Start Date: November 2000

***End Date*:** December 2003

Estimated Total ITS Funds: $100,000

Estimated Total Project Cost: $150,000

***Contacts*:**

Helen Tann	FTA Headquarters, TRI-12	(202) 366-0207
Tara Bartee	Florida DOT	(850) 414-5200

PORTLAND BUS DISPATCH SYSTEM EVALUATION

Description: The Tri-County Metropolitan Transportation District of Portland, Oregon (TRI-Met) has implemented a Bus Dispatch System that includes Global Positioning System/Automatic Vehicle Location, Automated Operations Software, Automatic Passenger Counters, Mobile Data Terminals, Surveillance Cameras, Silent Alarms, and Digital Communications. They are testing Traffic Signal Priority for buses and will be implementing Automatic Stop Announcements and using transit buses as Traffic Probes. The Volpe National Transportation Systems Center will compile and publish the results of Tri-Met's internal evaluations, Portland State University's evaluations, and any additional evaluation tasks performed by the Volpe National Transportation Systems Center in a single document.

Project Location: Portland, Oregon

Contractor(s): Volpe National Transportation Systems Center

Start Date: September 1998

***End Date*:** March 2003

Estimated Total ITS Funds: $100,000

Estimated Total Project Cost: $100,000

***Contacts*:**

Terrell Williams	FTA Headquarters, TRI-11	(202) 366-0232
Robert Casey	Volpe Nat'l Transportation Systems Center	(617) 494-2213
Ken Turner	Tri-Met	(503) 962-4918

Completed Projects

EVALUATION SUPPORT FOR ITS OPERATIONAL TESTS

Description: This was a support contract intended to provide technical support to FHWA headquarters and field offices as well as the operational test partners in designing and conducting operational test evaluations. The intent was to ensure the evaluations of the operational tests supported the national ITS program. The level of support varied from test to test depending on need and ranged from the review of draft plans and reports to the actual development of these plans and reports in some cases.

Project Location: McLean, Virginia

Contractor(s): Booz, Allen, Hamilton & Associates

Start Date: July 1994

***End Date*:** June 1999

Estimated Total ITS Funds: $8,832,000

Estimated Total Project Cost: $10,059,212

***Contacts*:**

Joe Peters	FHWA ITS JPO, HOIT	(202) 366-2202

IDAS CASE STUDIES

Description: This project developed four short reports documenting how the ITS Deployment Analysis System (IDAS) was used to evaluate a local ITS deployment. Each report discusses: deployment background, goals and objectives, agency technical capabilities, additional technical needs, analysis methods and assumptions, analysis results, conclusions and lessons learned.

Project Location: Washington, D.C.

Contractor(s): Cambridge Systematics, Inc.

Start Date: August 2001

***End Date*:** July 2002

Estimated Total ITS Funds: $75,000

Estimated Total Project Cost: $75,000

***Contacts*:**

Brian Gardner	FHWA Headquarters - HEPM	(202) 366-4061

ITS BENEFITS ASSESSMENT FRAMEWORK

Description: This project developed an analytical framework for assessing the benefits achievable from the deployment of ITS 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 was intended to encompass most ITS technologies, this project primarily concentrated on Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), and interacting Advanced Public Transit Systems (APTS). Planning models were used to assess both short- and long-term impacts of proposed ITS deployments. The product of this effort is a set of interrelated models for estimating the impacts of specific ITS deployment alternatives. Network and corridor case studies were produced using existing operational tests and corridor projects for which data exists.

Project Location: Cambridge, Massachusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: April 1992

***End Date*:** September 1995

Estimated Total ITS Funds: $2,000,000

Estimated Total Project Cost: $2,000,000

***Contacts*:**

Susan Slye	FHWA ITS JPO, HOIT	(202) 366-1068

ITS NATIONAL INVESTMENT AND MARKET ANALYSIS

Description:

The ITS National Investment and Market Analysis provided public agencies, private companies, and legislatures with an understanding of the scope, cost, and resulting benefits and opportunities expected to emerge as a result of realizing the national goals of fully deploying Intelligent Transportation Systems in the United States. Results of this study also will be used to inform discussions and hearings on the Intermodal Surface Transportation Efficiency Act (ISTEA) reauthorization and the Federal FY98 budget in early 1997.

This study supplemented existing and ongoing research to provide following answers.

- Quantify the public investment in the infrastructure required to satisfy national goal for ITS deployment.

- Explore the willingness of the private sector to invest in ITS based upon the expected public infrastructure deployment.

- Link the benefits received to the cost required to deploy the infrastructure.

- Determine the impact on the general economy of full investment in ITS technology.

- Summarize the findings of the research to present a picture of the possibilities for, and impact of, deploying Intelligent Transportation Systems into the next decade.

Project Location:

ITS America, Washington, DC

Partner(s):

ITS America worked in cooperation with the U.S. Department of Transportation's Joint Program Office to complete this analysis. Apogee Research, Inc., was the prime contractor with support from Wilbur Smith, and a team of advisors.

A steering committee and technical advisory committee comprised of other ITS stakeholder organizations advised the scope and direction of this effort.

Start Date:

June 1996

***End Date*:**

December 1997

Estimated Total ITS Funds:

$400,000

Estimated Total Project Cost:

$962,160

***Contacts*:**

Joe Peters	FHWA ITS JPO, HOIT	(202) 366-2202

ITS OPERATIONAL TEST META-EVALUATION

Description:

Although ITS operational tests include evaluations as an integral part, these evaluations are specific to the individual operational tests. To address national ITS program information needs, particularly those related to deployment decisions, additional information based on the comparison and analysis of inputs from all available information sources, including R&D, operational test results, and architecture efforts, is required. This project has provided meta-evaluation methodologies and applied those methodologies to address key questions of interest to FHWA in administering the national ITS program. Four studies have been conducted as part of this project. The various statistical approaches for the meta-evaluation of ITS user services were identified in a paper titled, "A Data Fusion Framework for Meta-evaluation of ITS System Effectiveness. A second study focused on the role of the incident detection component of freeway management systems and its role in the reduction of fatalities. This study was titled, "The Impact of Rapid Incident Detection on Freeway Accident Fatalities." In the third study, titled, "Reducing Accident Fatalities with Rural MAYDAY Systems," the impact of rural MAYDAY systems on rural roadway fatalities was examined. In the final study, titled "The Impact on Fatal Involvements of CVO User Services" the role of ITS CVO technologies in reducing fatal accidents involving commercial vehicles was examined.

Project Location: Washington, DC

Contractor(s): Mitretek Systems

Start Date: April 1994

***End Date*:** July 1996

Estimated Total ITS Funds: $332,000

Estimated Total Project Cost: $332,000

***Contacts*:**

Michael Freitas	FHWA ITS JPO, HOIT	(202) 366-9292

ITS USER ACCEPTANCE RESEARCH

Description:

This program examined two aspects of user acceptance of ITS products and services. 1) The ITS Joint Program Office conducted primary research to measure end-users' acceptance and willingness to pay for ITS user services. The program goal was to identify obstacles to and opportunities for encouraging broader ITS deployment. User groups included operators of commercial vehicles, private travelers, and public sector transportation managers. 2) Examining the evolution of the ITS consumer market, this user acceptance research project provided periodic reports on the market for traffic and traveler information products and services.

Completed reports (in chronological order) include "Critical Issues Relating to Acceptance of Commercial Vehicle Operations Services by Interstate Truck and Bus Drivers," May, 1995, Penn & Schoen Assoc.; "User Acceptance of ATIS Products and Services: A briefing book on the current status of JPO research," March, 1996, Charles River Assoc.; "ITS User Acceptance on Public Sector Transportation Managers: A Summary of Current ITI Deployment Knowledge," March, 1996, John A. Volpe National Transportation Systems Center;" "An Update of the Commercial ATIS Market," March, 1996, and January, 1997, Volpe Center;" "User Acceptance of ATIS Products and Services: What do we currently know?" October, 1996, Charles River Assoc.; "Acceptance of ATIS Products and Services: A report of qualitative research," December, 1996, Charles River Assoc.; "An Assessment of the ITS Commercial Trucking Market," February, 1997, Volpe Center, "Marketing ITS Infrastructure in the Public Interest," May 1998.

Research conducted in fiscal year 1999 addressed market demand of private travelers for in-vehicle crash avoidance countermeasures and advanced traveler information services.

Project Location: Washington, DC

Contractor(s): Contract for CVO: Penn & Schoen Associates, Contract for research on private travelers: Charles River Associates, and Contract for economic analysis: Volpe National Transportation Systems Center

Start Date: January 1994

***End Date*:** February 2000

Estimated Total ITS Funds: $2,647,680

Estimated Total Project Cost: $2,647,680

***Contacts*:**

Jane Lappin	EG&G Dynatrend	(617) 494-3692

MEASURING USER RESPONSE AT OPERATIONAL TESTS

Description:

This effort had two parts: A seminar entitled "Applying Consumer Research Methods to ITS Challenges" and a guidebook to collecting and analyzing user response and market acceptance data. The project was undertaken primarily to support the evaluation of field operational tests, but had applicability to other deployment-oriented ITS programs such as the Early Deployment and Priority Corridors Programs. The seminar and guide provided an analytical framework to assist program managers and evaluators in defining critical user acceptance research objectives, structuring a suitable experimental design, and selecting appropriate research tools.

The Volpe National Transportation Systems Center produced the seminar "Applying Consumer Research Methods to ITS Challenges" on April 12-13, 1995, in Boston, MA. The guidebook was available in early 1997.

Project Location: Cambridge, Massachusetts

Contractor(s): Volpe National Transportation Systems Center

Start Date: May 1994

***End Date*:** December 1995

Estimated Total ITS Funds: $250,000

Estimated Total Project Cost: $250,000

***Contacts*:**

John O'Donnell	Volpe National Transportation Systems Center	(617) 494-3692

IX. ARCHITECTURE, STANDARDS, AND NATIONAL COMPATIBILITY PLANNING

IX. ARCHITECTURE, STANDARDS, AND NATIONAL COMPATIBILITY PLANNING

National ITS Architecture Program. In July 1996, the Architecture Team completed development of the National ITS Architecture. This effort provided the supporting analysis, implementation strategy, and detailed requirements essential to accelerate the ITS standards development process. The National ITS Architecture, in conjunction with the developed standards, is supplying the transportation and communications framework necessary for a nationally compatible intelligent transportation system.

The architecture program has responded to stakeholder needs articulated in user services. It has identified interfaces between the system components, recommended the message sets and data that would be exchanged and that would need standards development, and has provided an implementation strategy for use by public and private sector transportation planners in developing their unique ITS systems. A thirty-second user service, maintenance and construction operations, was identified as a validated need by the rural community and was integrated into the National ITS Architecture in April 2002. Other areas under consideration for enhancement or as new user services include transportation security, intermodal freight, weather, and evacuation management. Thus, the National ITS Architecture will continue to be updated and maintained based upon evolving standards, deployment experiences, and stakeholder consensus for additional user services.

The overall program focus continues to be ITS deployment support. A new initiative begun in 1999 was the design of two levels of workshops to support regions and Metropolitan Planning Organizations (MPOs) in the development of their regional and project architectures. Nearly sixty of these workshops were conducted around the country through 2001 using the Turbo Architecture software tool. In 2001 the Regional ITS Architecture Guidance Document was developed for distribution to the FHWA Resource Centers and Divisions, state DOTs, and MPOs. Process workshops, using the guidance document as a basic reference, have been developed to replace the two level workshops which ended in CY 2001. Thirteen workshops with 35 regions participating were conducted in 2002. It is anticipated that the Federal Rule/Policy regarding the National ITS Architecture and Standards will heighten interest in the workshops. These workshops and their subsequent architectures should foster standardization and compatibility between projects and regions.

A continuing architecture effort has been the support of the standards development organizations (SDOs). The ITS Architecture Team has continued to work with them to facilitate the effort to accelerate the development, approval, and testing of national ITS standards.

Following more than 120 presentations by the Architecture Team to more than 2500 persons throughout the country, both the Architecture Training course and the Turbo Architecture course continue to be offered, currently under the auspices of the FHWA National Highway Institute. Educational and technical assistance is being provided to public and private sector organizations by the ITS Architecture Team in support of the overall ITS planning and deployment process. Understanding the broad foundation provided by the National ITS Architecture is leading to an acceleration of ITS deployment nationwide, bringing us closer to the vision set by the Intermodal

Surface Transportation Efficiency Act and providing momentum for the implementation addressed in the Transportation Equity Act for the 21st Century (TEA-21).

Projects described in this section include regional architectures being developed under the TEA-21 ITS Deployment Program.

ITS Standards Program. The ITS Standards Program is accelerating the development and promoting the widespread deployment of integrated ITS systems though robust, non-proprietary standards. Together with standards development organizations (SDOs) and other ITS stakeholders, the ITS Standards Program encompasses standards development, testing, outreach and education, technical assistance, and policy support. Information on the standards program and on the standards can be found on the Standards Web Site, www.its-standards.net.

- **Standards Development.** The U.S. DOT is committed to the accelerated development of ITS standards in cooperation with existing SDOs who develop open ITS standards through a consensus-based volunteer process. Currently, activities are underway leading to the development of about 100 ITS standards that address communications interfaces in the National ITS Architecture. As the National ITS Architecture continues to expand beyond recently incorporated areas such as highway-rail intersections and the archived data user service into proposed areas such as emergency services, the need for additional ITS standards will be assessed.

- **Standards Testing.** A comprehensive program to test ITS standards that are emerging from the standards development process began in 1999. The primary purposes of the ITS standards testing program are to investigate the operation, correctness, and completeness of the standards and to "prove" the standards in realistic settings. As an important measure to encourage acceptance and use of ITS standards, testing will provide timely and meaningful information on standards readiness to the ITS community. Testing includes experience-based testing by early deployers and more formal engineering-based testing. The testing program will leverage ongoing and planned ITS field deployments.

- **Standards Outreach and Education.** To promote the awareness and use of ITS standards, the ITS Standards Program includes a multi-faceted outreach and education program for public-and private-sector stakeholders involved in ITS deployment. The program includes non-technical outreach, technical outreach, and training and education.

  Non-technical outreach is aimed at communicating the rationale and benefits for using ITS standards to transportation stakeholders. Technical outreach educates the community on the content of standards, the status of their availability, the application of specific standards, and issues related to standards implementation. Outreach products, most of which are on the Standards Web Site, include resource materials, such as fact sheets and user guides, to assist users with standards-related deployments. Case studies and reports on "lessons learned" are being developed and disseminated to provide essential information needed by stakeholders and to build confidence in the standards.

Instructional training on ITS standards is being conducted through updated courses, new courses, workshops, and other formats, as appropriate. A variety of short courses and workshops on standards in general and on specific standards topics are available through the U.S. DOT Professional Capacity Building Program and through workshops provided by the Institute of Transportation Engineers. Recently, procurement specification writing workshops have been developed and presented across the Nation. Available training opportunities, grouped by subject category, as well as course content, registration information, and additional information, are provided on the Standards Web Site.

- **Standards Deployment Assistance.** To assist state and local public-sector transportation agencies with ITS standards-related deployments, the U.S. DOT is providing technical support, including in-depth assistance with the detailed mechanics of the standards. Standards experts can provide assistance in areas directly related to standards implementation, such as system planning, design, procurement, installation, and product and system acceptance. Technical assistance may be obtained through the FHWA ITS specialists assigned to Division Offices and Resource Centers, as well as through the ITS Standards Field Support Team. An additional valuable deployment support product is the deployment contacts database accessible on the Standards Web Site.

- **Standards Policy Support.** The Transportation Efficiency Act for the 21st Century (TEA-21) requires conformity to ITS standards for ITS projects using federal funds. Conformity to standards applies to those standards formally adopted by the U.S. DOT, a process that begins with a "Notice of Proposed Rulemaking." U.S. DOT has developed a set of criteria to determine when a standard could be considered for formal adoption. These criteria include, as a minimum, the following elements:

  1. The standard has been developed by a standards development organization.
  2. The standard has been successfully tested in real world applications, as appropriate.
  3. The standard has received some degree of acceptance by the community served by the standard.
  4. Products exist to implement the standard.
  5. There is adequate documentation to support the use of the standard.
  6. There is training available in the use of the standard, where applicable.

  The intent is to require the use of a standard only when these criteria have been met, and there has been a separate rulemaking on the adoption of the standard.

The ITS Standards Program is a multi-year program.

Regional ITS Architectures. The rule making process addressing the requirements for ITS projects to conform to the National ITS Architecture and Standards culminated in January 2001 with a rule requiring the development of regional ITS architectures. Regional ITS architectures help guide the integration of ITS components, and ensure that all are compatible with one another and with future ITS projects. Several ITS Integration Program projects initiated in FYs 1999 through 2002 are proposed regional ITS architectures.

Research

INTELLIGENT TRANSPORTATION SYSTEMS (ITS) SPATIAL DATA INTEROPERABILITY

Description:

Intelligent Transportation Systems (ITS) applications will require communication of locationally referenced information. Location referencing methods such as linear, link, address, and coordinate-based methods have been applied historically to limited geographic, functional, or organizational domains with homogeneous databases. ITS applications will be implemented over large domains, and will require location referencing in real time over communications links between dissimilar databases at central sites, at homes or offices, within the travelway infrastructure, and in vehicles.

By far the dominant requirements for location referencing are from those applications requiring vehicle tracking or location reporting, link travel time updates or other real-time information to vehicle navigation systems, and particular implementations assuming central-site generation of routes. This project will address these issues and accomplish the following:

* Support of appropriate standardization efforts to produce national and international location referencing standards and protocols that meet ITS needs.

* Participation in ISO TC204 and TC211 to monitor and facilitate harmonization of U.S. and international spatial standards.

* Support the ITS Data Registry activity, including coordination and harmonization of location referencing and spatial data concepts across all functional area data dictionaries.

* Develop a roadmap for spatial data interoperability among the different ITS application areas.

* Evaluate interoperability and metrics for assessing the level of interoperability within a region.

(The cost information below is the cumulative amount since the project's inception through the end of FY 2002.)

Project Location: Oak Ridge, Tennessee

Contractor(s): Oak Ridge National Laboratory

Start Date: June 1995

End Date: October 2003

Estimated Total ITS Funds: $2,209,500

Estimated Total Project Cost: $2,209,500

Contacts:

Mike Schagrin	FHWA ITS JPO, HOIT	(202) 366-2180
Steven Gordon	Oak Ridge National Laboratory	(865) 946-1313

INTELLIGENT TRANSPORTATION SYSTEMS STANDARDS PROGRAM

Description:

In support of the goal of widespread use of interoperable technologies for intelligent transportation systems (ITS), the specific objectives of the ITS Standards Program are:

- To promote the ability of public sector transportation agencies (and others) to choose from multiple vendors' ITS products and services. By fostering a competitive marketplace based upon open system standards, agencies will not be locked into proprietary systems from a single vendor. With open standards, agencies can choose from among multiple vendors and competing systems, resulting in lower cost and higher quality systems and services.

- To promote the creation of an innovative ITS market. Non-proprietary, open system standards lower the risk for new companies to enter the marketplace by removing barriers to market entry and by enabling innovative solutions. Because standards-conformant products and services are assured to be compatible technically with other standardized systems, design of new products and the introduction of new technologies is easier than if each element of a new system has to be custom designed.

- To facilitate interoperability at agency, jurisdictional, state and national levels. Standards enable common understanding and use of information and will promote coordination among ITS providers and users. Standards-conformant products and services will have a built-in level of interoperability.

- To ensure the safety of the traveling public. Human factor and operational guideline standards will ensure that ITS products and services will be used safely. Standardized ITS systems will reduce congestion, provide more and clearer information to travelers, and will reduce incident response times, all of which lead to safer travel conditions.

- To facilitate the deployment of ITS technologies. Standards will drive efforts towards deploying integrated systems because agencies will be able to reference appropriate standards in procurement packages.

- To promote international competitiveness of U.S. industry. The standards program will ensure that strong and substantiated positions will be forwarded to the international standards community for the development of international standards. Having international standards based upon U.S. standards will facilitate U.S. industrial competitiveness because U.S. companies will already have the required standards technologies and experience.

ITS standards include (1) protocols for communications, such as dedicated short-range communications between vehicles and roadside transponders, (2) message sets that specify the form and content of information transmitted among the various elements of the ITS system, (3) safety and human factor standards associated with the introduction of new ITS capabilities and devices, and (4) foundation standards that provide for uniformity across ITS applications, such as "data dictionaries" that define terminology, data formats, and acceptable values for data and standards that specify formats for geographic location information.

The ITS Standards Program is composed of five elements: standards development, standards testing, standards outreach and education, standards deployment assistance and standards policy support. The Standards Program initially focused upon development of standards needed to standardize the information flows of the National ITS Architecture. Now that the planned standards development efforts are nearing completion with over 90 standards in development, in ballot, or approved and published, the Standards Program is adopting a strong emphasis on deployment-support activities, such as standards testing,

outreach and education, and deployment technical support.

Standards testing will promote the integration and interoperability of ITS technologies and products and will build credibility of the standards and reassure deployers that the standards perform as intended. The purpose of standards testing is to investigate the completeness, correctness and interoperability of the standards and to "prove" the standards in realistic transportation settings under operational conditions. Through testing and widespread distribution of test results, ITS standards will "mature" more quickly, thereby leading to their earlier acceptance by ITS stakeholders.

Standards outreach and education activities are aimed at ensuring that all public transportation stakeholders and those in the private sector who are involved in ITS implementation are aware of ITS standards and the educational and training opportunities that will help them become knowledgeable about the scope and use of these standards. The intent is to help deployers and vendors become aware of and familiar with ITS standards and understand the applicability of the standards. It also includes extensive development of resource materials, documentation on ITS successes ("lessons learned" and case studies), and evaluation of the effectiveness of the outreach and education efforts.

Deployment support efforts include providing technical advice, sample procurement specifications, resource materials that explain which standards may apply to a given application, and contacts who are experienced in deploying similar projects.

Information on the ITS Standards Program, in-depth information on the standards, and links to additional sources of information are available on the standards Web site: www.its-standards.net.

The cost figures below are for fiscal year 2002.

Project Location: Various

Contractor(s): SAE; ASTM; IEEE; AASHTO, ITE

Start Date: January 1996

***End Date*:** October 2003

Estimated Total ITS Funds: $11,406,000

Estimated Total Project Cost: $11,406,000

Contacts:

Michael Schagrin	FHWA ITS JPO, HOIT	(202) 366-2180

ITS STANDARDS TESTING

Description:

To promote the integration and interoperability of ITS technologies and products, the U.S. DOT is undertaking a comprehensive program to test ITS standards that are emerging from the standards development process. The primary purposes of the standards testing program are to investigate the performance of the standards and to "prove" the standards in actual transportation settings under realistic conditions. As an important step to encourage acceptance and early adoption of the standards, testing will provide timely and meaningful information on standards performance to the ITS community. Through testing and widespread distribution of test results, ITS standards will "mature" more quickly, thereby leading to their earlier acceptance by ITS stakeholders.

In March 1999, the Battelle Memorial Institute was selected to test ITS-related standards that have been developed by standards development organizations (SDOs). In this work, Battelle is working with U.S. DOT, State DOTs, SDOs, product vendors and other stakeholders to test and evaluate the performance of approximately 50 standards at 10 to 12 different deployment sites across the country. The objective of the project is to assess the standards performance in meeting ITS project functional requirements, evaluate the ability of the standards to accomplish interoperability in ITS deployments, and demonstrate to all stakeholders the performance and benefits that can be obtained by using the standards.

The funding levels depicted below are cumulative amounts since the project's inception in 1999 through the end of FY 2003.

Project Location: Various sites

Partner(s): FHWA ITS Joint Program Office, Battelle Memorial Institute

Start Date: March 1999

End Date: October 2003

Estimated Total ITS Funds: $3,265,468

Estimated Total Project Cost: $3,265,468

Contacts:

Michael Schagrin	FHWA ITS JPO, HOIT	(202)366-2180
Jerry Pittenger	Battelle Memorial Institute	(614) 424-5189

Deployment Support

NATIONAL ITS ARCHITECTURE EVOLUTION AND SUPPORT

Description:

The National ITS Architecture, first delivered in June 1996 with 29 user services, has been modified to encompass three additional user services - highway-rail intersection, archived data, and maintenance and construction operations. A new user service initiation procedure has been developed and published in the Federal Register to ensure stakeholder awareness and participation. A FHWA ITS Architecture and Standards Rule and FTA Policy on Transit Projects were issued in early 2001 to address the requirement for an architecture for all ITS projects receiving Federal Highway Trust Funds. The U.S. DOT is continuing to recognize the value in the past investment and is taking measures to ensure the validity and necessity for the continued use of the National ITS Architecture in transportation projects.

There are three major tasks in this project. The first is to maintain the National ITS Architecture as it continues to evolve through deployment experiences, added stakeholder involvement, and coordination with states and other countries. It is available on the World Wide Web at www.its.dot.gov and on CD-ROM, with the latest version (4.0) incorporating the maintenance and construction operations user service made available for distribution on CD-ROM in April 2002.

The second task is the integration of new user services into the National ITS Architecture. Intermodal freight, weather, emergency/incident management, evacuation management, and transportation security are some of the areas being considered for enhancement/integration in the next years of the program with the latter being the primary area of focus. Discussions are anticipated with our North American neighbors to ensure we consider the same user services for our respective architectures. These user service actions and maintenance efforts on the evolving National ITS Architecture continue to keep it the definitive reference for all ITS projects.

The third task is ITS deployment support. The Regional ITS Architecture Guidance Document was developed in 2001, and has been distributed to the FHWA Resource Centers and Divisions, state DOTs, and Metropolitan Planning Organizations (MPOs). This reference will be used by all MPOs, and is being supplemented with process workshops to facilitate development of their regional ITS architectures and conformance with the Architecture and Standards Rule/Policy. Up to thirty of these process workshops are anticipated by the end of 2003. In addition, deployment support will continue to encompass an interface with standards development to ensure synergism in the ITS program.

Project Location: Anaheim, California

Partner(s): Iteris, Inc.

Start Date: October 2001

***End Date*:** September 2006

Estimated Total ITS Funds: $21,500,000

Estimated Total Project Cost: $21,500,000

Contacts:

Lee Simmons	FHWA ITS JPO, HOIT	(202) 366-8048

Regional ITS Architectures and Planning

DEVELOPMENT OF A HUNTSVILLE, ALABAMA REGIONAL ITS ARCHITECTURE AND STRATEGIC PLAN

Description:

This project comprises the FY 2000 Huntsville, Alabama Earmark. The City of Huntsville, AL, experiencing the effects of rapid population growth and expanding commercial activity, is seeking to improve the efficiency of existing transportation systems. To achieve this objective, Huntsville authorities foresee the need to deploy and integrate ITS infrastructure to upgrade freeway management systems, arterial management systems, transit management systems, and incident management. To establish a framework enabling an effective decision-making process for implementation of ITS, the earmarked funding will be applied to the development of a Huntsville Regional ITS Architecture and Strategic Plan. This initiative will also include the detailed design of at least one high priority objective identified in the plan. Provisions of the Strategic Plan will include:

- A regional system inventory
- Identification of the Huntsville area's transportation problems
- Identification of potential applicable ITS user services
- Development of the Regional ITS Architecture
- Development of a Regional Communications Plan
- A 1- 5-year concept of operations
- A 20-year long-range vision
- Implementation phasing and estimated cost

Project Location: Huntsville, Alabama

Partner(s): FHWA; Alabama DOT; City of Huntsville; Urban Development Department; Public Transit Division; Police Department

Start Date: September 2000

***End Date*:** December 2003

Estimated Total ITS Funds: $393,211

Estimated Total Project Cost: $491,514

***Contacts*:**

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377
Tim Barnett	City of Huntsville	(256) 427-5300

FY 2002 STATE OF TEXAS REGIONAL ITS ARCHITECTURE DEVELOPMENT AND ITS DEPLOYMENT PLAN PROJECTS

Description:

The projects addressed here comprise the FY 2002 ITS Integration Program Texas Statewide earmark. Each of the regions identified below will develop a Regional ITS Architecture and ITS Deployment Plan tailored to address needs specific to each area.

The endeavor in each region will follow a sequence of steps which will focus on:

- Developing broad stakeholder participation.
- Identifying local needs which can be addressed through ITS applications.
- Including multi-modal, transit and highway considerations in all decisions.
- Developing a formal ITS Deployment Plan which identifies short term ITS deployment opportunities and long term ITS deployment goals and objectives.
- Defining a Regional ITS Architecture to the architecture flow level.
- Incorporating ITS in the applicable regional transportation plan.

Cost data are common to all projects with one exception: ITS Funding - $115,000; Total Funding - $230,000. The exception is the Waco Region where ITS Funding is $125,000 and Total Funding is $250,000.

Schedule and contact information by region are as follows: The first end date identifies completion of architecture development; the second date identifies Deployment Plan completion.

Abilene Region: Start Date: 9/30/02; End Date: 12/03, 6/04; POC: Roy Wright;

Lubbock Region: Start Date: 9/30/02; End Date: 5/04, 6/05; POC: Ted Copeland;

Odessa Region: Start Date: 9/30/02; End Date: 12/03, 6/04; POC: Mike McAnally;

San Angelo Region: Start Date: 9/30/02; End Date: 12/03, 6/04; POC: Angie Ortegon;

Waco Region: Start Date: 9/30/02; End Date: 12/03, 6/04; POC: Larry Colclasure;

Wichita Falls Region: Start Date: 9/30/02; End Date: 12/03, 6/04; POC Davis L. Powell

Project Location:

Texas Statewide

Partner(s):

FHWA, Texas DOT common to all regions. Abilene Region: Cities of Abilene, Clyde, Baird, Eastland, Cisco, Ranger, Sweetwater, Roscoe, Big Spring; Counties of Taylor, Callahan, Nolan, Mitchell, Howard. Lubbock Region: Cities of Lubbock and Plainview; Counties of Dawson, Lynn, Lubbock, Hale, Swisher, Hockley, Lamb, Bailey and Palmer; and Lubbock MPO. Odessa Region: Cities of Odessa, Midland, Fort Stockton, Andrews, Pecos, Monahans, Balmorhea; Counties of Ector, Midland, Reeves, Ward, Pecos, Terrell, Upton, Andrews, Martin and Crane; NM State Highway & Transportation Dept.; Permian Basin Regional Planning Commission. San Angelo Region: Counties of Crockett, Sutton, Sonora, and Kimble; Cites of Sonora and Junction. Waco Region: City of Hillsboro; Counties of Bell, Hill, and McLennan; Waco, Temple, and Belton MPOs. Wichita Falls Region: OKDOT; City of Wichita Falls; TX and OK Depts. of Public Safety

Start Date:

September 2002

***End Date*:**

June 2005

Estimated Total ITS Funds: $700,000

Estimated Total Project Cost: $1,400,000

Contacts:

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Roy Wright	TxDOT - Abilene District	(915) 676-6805
Ted Copeland	TxDOT - Lubbock District	(806) 748-4429
Mike McAnally	TxDOT - Odessa District	(915) 498-4740
Angie Ortegon	TxDOT - San Angelo District	(915) 947-9211
Larry Colclasure	TxDOT - Waco District	(254) 867-2800
Davis Powell	TxDOT - Wichita Falls District	(940) 720-7717

JOINT OPERATIONS CENTER (JOC) CONCEPTUAL DESIGN AND SYSTEMS INTEGRATION

Description:

This project is a component of the FY 2000 ITS Integration Program State of Nebraska earmark. The project is designed to integrate existing ITS systems and legacy systems owned by project partners in the state to provide a coordinated and integrated system for emergency management, public safety services and transportation management. Existing ITS systems to be evaluated for inclusion include, but are not limited to, systems in the metropolitan areas of Omaha, Lincoln, the I-80 corridor and the Nebraska Department of Roads (NDOR) districts across the state. Existing communications systems (Emergency Management Systems, NDOR Maintenance, Rural Transit, three area airports, WIM, intercity transit, NSP, RWIS, Dynamic Message Signs, Commercial Vehicle Information System Networks, proprietary surveillance and Traveler Information Kiosks) will be examined by a qualified, interdisciplinary ITS consulting organization.

When implemented, the Nebraska Statewide JOC will provide three major state agencies serving Nebraska's urban and rural transportation, public safety and emergency management needs with a Joint Operations Center serving Nebraska 24 hours per day, seven days per week. The Statewide JOC will provide a platform for multi-jurisdictional operational support in areas of traffic management, public safety and emergency preparedness. Technical requirements for a statewide data intake, classification, and redistribution will be considered.

This project will initiate the study which will identify in detail the JOC/TMC functional requirements, system design, concept of operations, and integration requirements.

Project Location: Nebraska Interstate 80 Corridor

Partner(s): FHWA, Nebraska Dept. of Roads, Nebraska State Patrol, City of Omaha Public Works, City of Lincoln

Start Date: October 2001

***End Date*:** June 2003

Estimated Total ITS Funds: $225,000

Estimated Total Project Cost: $500,000

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977
James Pearson	Nebraska Dept. of Roads	(403) 479-3812

MUNICIPALITY OF ANCHORAGE ITS ARCHITECTURE

Description: This project is the Municpality of Anchorage (MOA) FY 2001 ITS Integration Program earmark. The MOA regional ITS architecture will include: Support Services, Outreach, Needs Assessment, Long Range Vision and a Concept of Operations. The regional ITS architecture will associate systems and information flows; make communications recommendations; and define an institutional information-sharing plan.

Project Location: Anchorage, Alaska

Partner(s): FHWA, FTA, Alaska DOT&PF, Municipality of Anchorage

Start Date: May 2002

***End Date*:** May 2003

Estimated Total ITS Funds: $50,000

Estimated Total Project Cost: $100,000

***Contacts*:**

Al Fletcher	FHWA Alaska Division, HDA-AK	(907) 586-7245
Jeff Ottesen	ADOT&PF	(907) 465-6971

REGIONAL ARCHITECTURE DEVELOPMENT FOR THE BIRMINGHAM AREAWIDE TRANSPORTATION MANAGEMENT SYSTEM

Description: This project is a component of the FY 2000 State of Alabama Earmark. The project is an integral part of a major ITS initiative in the Birmingham, AL metropolitan area which has been largely funded by Congestion Mitigation and Air Quality funds. In response to air quality nonattainment status for ozone, ALDOT and project partners have initiated a comprehensive, phased areawide Transportation Management System with emphasis on freeway management and incident management systems. In order to establish a framework for the integration and interoperability of ITS systems, a Regional Architecture will build on the existing framework already established by the ALDOT and project partners by integrating the planned projects and adding user services such as Birmingham-Jefferson County Transit Authority (BJCTA), Commercial Vehicle Operations, and Advanced Vehicle Control and Safety Systems. The CVISN Business Plan will be developed in conjunction with the Regional Architecture to ensure consistency and integration between sub-system components. A Regional Architecture is a tool that the ALDOT will use when planning future projects and establishing protocols and links to project partners. It will define User Service considerations when developing links with the Transportation Management Center and local Traffic Control Centers.

Project Location: Birmingham, Alabama

Partner(s): FHWA; Alabama DOT; Birmingham-Jefferson County Transit Authority; Birmingham Regional Planning Commission; Jefferson County; Shelby County; City of Hoover

Start Date: September 2000

***End Date*:** March 2003

Estimated Total ITS Funds: $182,347

Estimated Total Project Cost: $227,934

***Contacts*:**

Linda Guin	FHWA Alabama Division, HDA-AL	(334) 223-7377
Bob Kratzer	Alabama DOT	(334) 242-6253

REGIONAL INTELLIGENT TRANSPORTATION SYSTEM/INCIDENT MANAGEMENT STRATEGIC IMPLEMENTATION PLAN FOR NORTHWEST LOUISIANA

Description:

This project is the FY 2000 ITS Integration Program earmark for Shreveport, LA. Funding for this project was partially obligated in June 2001 in the amount of $121,700. The ultimate project goals are to satisfy traffic management, incident management, Commercial Vehicle Operations and Road Weather Information Systems needs in the Northwest Louisiana Region. Key objectives in support of these goals are development of a regional ITS architecture and a Northwest Louisiana Regional ITS/Incident Management Strategic Implementation Plan.

The Regional ITS/Incident Management Plan will identify key ITS corridors, institutional issues, deployment goals and opportunities for integration. Project phasing envisions an analysis of existing subsystems, and identification of newly proposed technologies such as transit, paratransit and safety enhancements. New and legacy systems will be addressed in the framework of a regional architecture conforming to the National ITS Architecture. Follow-on project activity will be focused on procurement, installation, testing and integration of field devices required to support Traffic Management Center interoperability.

Project Location: Shreveport/Bossier City Urbanized Area, Louisiana

Partner(s): FHWA, FTA, Louisiana Department of Transportation and Development (LA DOTD), City of Shreveport, Northwest Louisiana Council of Governments

Start Date: June 2001

***End Date*:** September 2003

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $1,572,842

***Contacts*:**

John Broemmelsiek	FHWA Louisiana Division, HDA-LA	(225) 757-7614
Steve Glascock	LADOTD	(225) 935-0130

REGIONAL ITS ARCHITECTURE AND ITS DEPLOYMENT PLAN FOR THE BEAUMONT, TEXAS REGION

Description:

This project is the FY 2001 ITS Integration Program earmark for Beaumont, Texas. The project will develop a Regional ITS Architecture and ITS Deployment Plan for the Beaumont region which borders Louisiana.

Traffic densities have increased substantially as a consequence of the development of recreational areas, the petrochemical industry, Gulf Coast ports, retail complexes and centers of education. Implementation of a regional architecture is expected to establish the foundation for deployment and integration of ITS technologies to alleviate congestion, increase throughput and enhance commercial vehicle safety. Related benefits envisioned include enhanced incident management and emergency management to include hurricane evacuation.

A broadly-based ITS Steering Committee has been formed. The architecture development process will consider transit, identify short-term ITS deployment opportunities, and provide long-term objectives and goals.

Project Location: Beaumont Region, Texas

Partner(s): FHWA; Texas DOT; Texas Dept. of Public Safety; Louisiana DOT; Cities of Beaumont, Bridge City, China, Nome, Orange, Pinehurst, Port Arthur, Port Neches, Silsbee, Sour Lake, Vidor, West Orange; Counties of Chambers, Hardin, Jefferson, Liberty, Orange; SE Texas Regional Planning Commission; SE Texas Regional Airport; Lamar University; Lamar State College

Start Date: September 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $119,042

Estimated Total Project Cost: $238,804

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Janet Manley	Texas DOT	(409) 898-5768

REGIONAL ITS ARCHITECTURE AND ITS DEPLOYMENT PLAN WITH INTEGRATION FOR THE LOWER RIO GRANDE VALLEY

Description:

This project is part of the FY 1999 Integration Program earmark for the State of Texas. The Lower Rio Grande Valley Region of Texas has seen unprecedented growth of the past decade. Increased trade with Mexico is a major contributor to the amount of traffic in the region as reflected in approximately 70,000 border crossings per day at the Gateway, Los Indios, Pharr and Hidalgo Bridges. Implementation of ITS technologies in an integrated approach will also result in improved emergency management during hurricanes and hazardous cargo incident response at the Ports of Entry.

Project Location:

Lower Rio Grande Valley Region, Texas

Partner(s):

FHWA; Texas DOT; Cities of Brownsville, Edinburg, Harlingen, McAllen, Mission, Pharr, San Benito; Counties of Cameron, Hidalgo; Texas Department of Public Safety; U.S. Customs Service; U.S. Immigration & Naturalization Service; U.S. Border Patrol; U.S. Department of Agriculture; Brownsville, Harlingen-San Benito, McAllen, Pharr and Edinburg MPOs

Start Date:

November 1999

***End Date*:**

May 2003

Estimated Total ITS Funds:

$150,000

Estimated Total Project Cost:

$300,000

***Contacts*:**

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Jesse Leal	Texas DOT (Pharr District)	(956) 702-6127
Bernie Walker	Texas DOT Traffic Operations-TM	(512) 416-3437

STATE OF TEXAS REGIONAL ITS ARCHITECTURE DEVELOPMENT AND ITS DEPLOYMENT PLAN PROJECTS

Description:

The following projects, all of which are components of the FY 2000 State of Texas earmark, have been consolidated into a single report. The projects have identical objectives at each of the regions identified within the State of Texas. The purpose of these projects is to identify local needs that can be addressed through ITS applications. Each region will develop a formal ITS plan providing short-term ITS deployment opportunities and long-term ITS deployment goals and objectives. The expected result in all cases includes defining a Regional ITS Architecture to the architecture flow level, and incorporating ITS in the applicable transportation plan. In each case, the region identified is providing matching funds in the amount of the earmarked funding. The regions developing Regional ITS Architecture and ITS Deployment Plans and their corresponding funding levels are:

Amarillo, TX
ITS Funding: $150,000
Total Funding:$300,000

Atlanta, TX
ITS Funding: $150,000
Total Funding:$300,000

Childress, TX
ITS Funding: $100,000
Total Funding: $200,000

Tyler, TX
ITS Funding: $150,000
Total Funding: $300,000

El Paso, TX
ITS Funding: $50,000
Total Funding: $100,000

The values appearing in the estimated cost fields below are totals for these projects. In all cases, the start and completion dates for these projects are the same.

Project Location:

Texas

Partner(s):

FHWA; TXDOT; TX Dept. of Public Safety; Amarillo Area and Tyler MPOs; AR Hwy. & Transportation Dept.; Cities of: Amarillo, TX; Borger, TX; Dalhart, TX; Dumas, TX; Pampa,TX; Perryton, TX; Vega, TX; Texarkana, TX; Texarkana, AR; Wake Village, TX; Nash, TX; Childress, TX; Tyler, TX; El Paso, TX. Counties of: Armstrong; Carson; Dallas; Deaf Smith; Gray; Hansford; Hartley; Hamphill; Hutchinson; Lyscomb; Moore; Ochiltra; Oldham; Potter; Randall; Roberts; Sherman; Miller; Bowie; Buscoe; Childress; Collingsworth; Cottle; Dickens; Donley; Foard; Hall; Hardman; King; Knot; Motley; Wheeler.

Start Date:

September 2000

***End Date*:** October 2003

Estimated Total ITS Funds: $600,000

Estimated Total Project Cost: $1,200,000

Contacts:

Mark Olson	FHWA Texas Division, HPC-TX	(512) 536-5972
Carlos Ibarra	TXDOT (Atlanta)	(903) 799-1480
Clyde Harper	TXDOT (Childress)	(940) 937-7185
Peter Eng	TXDOT (Tyler)	(903) 510-9204
Ricardo Cortez	TXDOT (El Paso)	(915) 774-4335
David Miller	TXDOT (Amarillo)	(806) 356-3291

STATEWIDE ITS WIRELESS COMMUNICATIONS PLAN

Description: This project is a component of the FY 2002 ITS Integration Program Washington Statewide earmark. The project is a study whose purpose is to develop a comprehensive statewide Wireless Communications Plan designed to complement the current ITS Architecture and Statewide Communications (Wireline) Plan. A related objective is the development of a list of projects designed to integrate WSDOT's existing and planned wireline system with Washington's proposed next-generation wireless system.

Project Location: Washington State

Partner(s): FHWA, Washington State DOT, Washington State Patrol, Washington State Dept. of Licensing

Start Date: September 2002

***End Date*:** March 2003

Estimated Total ITS Funds: $82,812

Estimated Total Project Cost: $240,624

***Contacts*:**

Mike Brower	FHWA Washington Division, HMO-WA	(360) 753-9550
Ron Vessey	WSDOT	(206) 221-2687

STATEWIDE NEBRASKA ITS ARCHITECTURE ELEMENT

Description: This project is the Statewide Nebraska ITS Architecture component of the FY 2001 Nebraska ITS Integration Program earmark. The project will build on the results of Tier 1 and Tier 2 Architecture workshops conducted during 2000. The project will address existing and planned ITS needs in Nebraska's three MPOs, eight engineering districts and the Interstate 80 corridor. The planned Statewide ITS Architecture will emphasize urban and rural transit, maintenance and construction operations, incident management, emergency management, traveler information, and commercial vehicle operations. Stakeholders in the architecture development effort include the Nebraska State Patrol, MPOs, eight district offices, and jurisdictions involved in transportation, public safety and incident management, maintenance and construction operations, public transit, and traveler information.

Project Location: Nebraska

Partner(s): FHWA, Nebraska Dept. of Roads (NDOR), Metropolitan Planning Organizations (MPOs) for Omaha, Lincoln and SIMPCO.

Start Date: December 2001

***End Date*:** September 2003

Estimated Total ITS Funds: $204,648

Estimated Total Project Cost: $409,296

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977
Jim McGee	NDOR	(402) 471-1811

THURSTON COUNTY ITS

Description:

This FY 2000 earmarked project is a systems integration initiative to develop a Transit Architecture Plan, define a Regional ITS Architecture, and ultimately identify operation requirements for ITS subsystems and the identification of information flows that connect them. The project will be implemented in three phases:

- Development of a Transit Architecture and Plan.
- Participation in the development of an overall Regional ITS Architecture.
- Integration and Deployment requirements definition.

Project Location: Thurston County, Washington

Partner(s): Washington State DOT, Intercity Transit, Thurston Regional Planning Council, Thurston County, City of Olympia, City of Lacey, City of Tumwater

Start Date: September 2000

***End Date*:** September 2003

Estimated Total ITS Funds: $786,421

Estimated Total Project Cost: $1,572,842

***Contacts*:**

Linda Gehrke	FTA Region 10	(206) 220-4463
Roger Dean	Intercity Transit	(360) 705-5837

WASHOE COUNTY REGIONAL ITS ARCHITECTURE/INTEGRATION PLAN

Description:

This project is the FY 2001 ITS Integration Program earmark for Washoe County, Nevada. The Regional Transportation Commission (RTC) of Washoe County, NV is the Metropolitan Planning Organization for the Reno/Sparks Metropolitan Area, and will develop a Regional ITS Architecture/Integration Plan. This earmark will fund the development of a plan to deploy ITS technologies in the region, outline a regional ITS architecture, identify ITS standards, and integrate all existing and committed ITS projects throughout the region. The plan and architecture will link freeway system, transit services, arterial streets, traveler information, and regional traffic signal systems into a coherent framework to support the following objectives:

- Promote shared ITS goals in the region.
- Guide ITS regional ITS investment strategy.
- Generate coordination among stakeholders.
- Maintain focus on user services implementation.
- Smooth intermodal linkages, and ensure integration into a national transportation system.

Project Location: Washoe County, Nevada

Partner(s): FHWA, Nevada DOT, Regional Transportation of Washoe County, Washoe County, Cities of Reno and Sparks

Start Date: September 2001

***End Date*:** September 2003

Estimated Total ITS Funds: $158,723

Estimated Total Project Cost: $317,446

***Contacts*:**

Jim Allen	FHWA Nevada Division, HDA-NV	(775) 687-1231
Tina Wu	RTC of Washoe County	(775) 348-0480

Completed Projects

AUGMENTATION FOR GPS

Description:

This project was a three phase effort that supported and facilitated the development of a nationwide GPS Augmentation infrastructure to provide the basic positioning system for the public safety aspects of ITS. Phase I analyzed the ability of available GPS Augmentation systems to meet user requirements. Recommendations for the most effective GPS Augmentation services were developed. Phase II was an-depth analysis of the characteristics of the systems recommended under Phase I to determine if there were any technical issues that needed resolution. This included interference analysis, development of a system concept, and a tradeoff analysis of various technical parameters. Phase III was a study of the institutional and policy issues that needed to be resolved upon implementation of the recommended GPS Augmentation system. Examples of these issues included liability in case of degraded system performance, and the impact on the user community, service providers and the commercial electronics industry as a whole. Several scenarios were examined including a privately installed, operated and maintained system, a publicly installed, operated and maintained system and various combinations of these two.

Project Location: Boulder, Colorado; Annapolis, Maryland; Rockville, Maryland

Partner(s): Institute for Telecommunication Sciences and ARINC

Start Date: February 1994

***End Date*:** September 1999

Estimated Total ITS Funds: $2,430,000

Estimated Total Project Cost: $2,755,000

***Contacts*:**

James Arnold	FHWA - TFHRC, HRDO-04	(202) 493-3265

ELECTROMAGNETIC COMPATIBILITY TESTING FOR ITS

Description: A resource has been established to conduct evaluations of the electromagnetic compatibility of various proposed ITS communications components, operating singly and in combination. Many of the issues which were investigated were drawn from the ITS System Architecture development effort. Sophisticated simulations, anechoic chambers, and antenna test ranges were employed to perform this testing.

Project Location: Colorado

Contractor(s): Institute for Telecommunication Sciences of the National Telecommunications and Information Administration

Start Date: June 1993

***End Date*:** November 2001

Estimated Total ITS Funds: $3,171,000

Estimated Total Project Cost: $3,171,000

***Contacts*:**

James Arnold	FHWA - TFHRC, HRDO-04	(202) 493-3265

ITS COMMUNICATIONS ALTERNATIVES TEST AND EVALUATION

Description: Investigations into communications technologies and issues associated with ITS systems were conducted. Activities were focused upon identifying and analyzing particular communications technologies, which included wireless and wireline, for ITS functions. Investigations also included communications protocol issues. Preferred communications alternatives were recommended for specific ITS functions. Finally, a technical analysis of required quantity and location of spectrum was completed.

Project Location: Annapolis, Maryland

Contractor(s): ARINC

Start Date: July 1994

***End Date*:** January 1999

Estimated Total ITS Funds: $3,628,423

Estimated Total Project Cost: $3,628,423

***Contacts*:**

James Arnold	FHWA - TFHRC, HRDO-04	(202) 493-3265

NATIONAL ARCHITECTURE DEPLOYMENT SUPPORT

Description:

A consensus national architecture was developed to serve as the framework for Intelligent Transportation Systems deployment; however, U.S. DOT recognized the need for follow-on tasks to be accomplished to maximize the return on this investment. The first task was to maintain the National ITS Architecture in a current status, incorporating input from deployment programs throughout the country as well as from emerging ITS standards. It is available on the World Wide Web and on CD-ROM for the broadest and most user-friendly distribution. Version 3.0 of the CD-ROM, incorporating the new archived data user service and other changes, has been available since December 1999. The next version will incorporate a new user service, maintenance and construction operations, as well as a focus on rural needs and updates in other areas of the National ITS Architecture. It will thus continue to be the definitive and accurate reference for ITS deployment planning.

The second task was ITS deployment support. Two levels of workshops were initiated in late 1999 - Tier I and Tier II - to support Metropolitan Planning Organization/Statewide development of regional and project architectures. Tier I and Tier II workshops were conducted around the country, using the new Turbo Architecture software tool, from late 1999 through 2001. In addition, the Architecture Team continued to meet with public and private sector personnel across the transportation spectrum and assisted in defining and explaining the National ITS Architecture and its benefits to users.

The third task was to train transportation professionals, both public and private sector, in using the National ITS Architecture. More than 120 presentations to over 2500 persons have been conducted throughout the country through 2000. Beginning in 2001, the sponsorship for this course transitioned to the FHWA National Highway Institute. In addition to these tasks, the Architecture Team continued working with the Standards Development Organizations (SDOs) to assist in accelerating standards development, testing, and approval. This involved continuing their active participation with SDO committees and subcommittees in varying standards efforts.

Project Location: Manassas, Virginia and Anaheim, California

Contractor(s): Lockheed Martin Corporation and Iteris, Inc. (subsidiary of Odetics, Inc.)

Start Date: September 1996

***End Date*:** September 2001

Estimated Total ITS Funds: $20,728,405

Estimated Total Project Cost: $20,728,405

***Contacts*:**

Lee Simmons	FHWA ITS JPO, HOIT	(202) 366-8048

NATIONAL ARCHITECTURE DEVELOPMENT

Description:

The National ITS Architecture has been developed to guide, not mandate, consistency among investors, purchasers, producers, and users in order to reduce the risk of incompatibility among the numerous intelligent transportation systems components to be manufactured and purchased in this industry. Phase I of the architecture development involved four industry teams, each producing an open national ITS architecture that provided the full set of ITS services (as defined in the National ITS Program Plan) while meeting critical ITS goals and objectives. In Phase II of the architecture development, two of the four teams were selected to resolve differences and develop the final national ITS architecture in an open, non-competitive process that allowed for outside input. Phase II has been completed and the single National ITS Architecture was produced and documented. An additional user service, highway rail intersection (HRI), has been identified, and was incorporated into the National ITS Architecture in January 1997.

The architecture development program, to include the HRI user service, has yielded a comprehensive set of standards requirements that have been forwarded to the ITS Standards Program Office and ITS-contracted Standards Development Organizations in order to accelerate ITS standards development.

Project Location: Manassas, Virginia and Anaheim, California

Contractor(s): Lockheed Martin Federal Systems and Rockwell International Corporation

Start Date: September 1993

***End Date*:** January 1997

Estimated Total ITS Funds: $19,018,940

Estimated Total Project Cost: $19,018,940

***Contacts*:**

Lee Simmons	FHWA ITS JPO, HOIT	(202) 366-8048

STATE OF NEW MEXICO STATEWIDE ITS ARCHITECTURE

Description:

The purpose of this project was to develop a Statewide ITS Architecture which will integrate metropolitan, multimodal and rural ITS components. Statewide and metropolitan planning activities considered an array of actions and investments that improve the networks' overall capabilities; consider regional operations and management strategies; include ITS services and development of a regional ITS architecture; engage a wide array of stakeholders to ensure a broad range of integration opportunities; and incorporate ITS into the Statewide transportation planning process.

The development of a Statewide Architecture is intended to achieve the following goals and objectives:

1. Identification of a broad range of stakeholders by addressing individual and common needs to achieve integration and information sharing;

2. Identification of transportation needs addressed by ITS through operational and management strategies to meet the goals and needs while minimizing risks and costs of integration;

3. Description of existing and planned ITS enhancements to aid in adding value to legacy systems and support interoperability with planned systems, thereby improving the operations and management of the transportation system;

4. Definition of operating requirements to develop operational agreements across state, physical and institutional boundaries;

5. Identification of planned capital projects to determine which ITS project can be implemented into the construction;

6. Development of a phasing schedule to enable deployment of integrated components over time;

7. Development of regional technology agreements and partnership arrangements among state and local agencies and entities and encouraging public/private partnerships;

8. Identification of planned improvements for inclusion of ITS projects into the Statewide Transportation Improvement Program (STIP), Transportation Improvement Programs (TIPS) and/or Commercial Vehicle Safety Plan.

Project Location:

State of New Mexico

Partner(s):

New Mexico State Highway and Transportation Dept.; City of Albuquerque Transit; Public Works and Environmental Health Dept.; Bernalillo County Dept. of Public Works; City of Rio Rancho Public Works Dept.; Sandoval County; Middle Rio Grande Council of Governments; University of New Mexico

Start Date:

September 1999

***End Date*:**

October 2000

Estimated Total ITS Funds: $50,000

Estimated Total Project Cost: $100,000

Contacts:

Joe Maestas	FHWA New Mexico Division, HDA-NM	(505) 820-2026

SYSTEM ARCHITECTURE CONSENSUS BUILDING AND OUTREACH

Description:

This project was the outreach arm of the effort to develop and analyze a system architecture and deployment strategy, to provide the foundation for nationally interoperable ITS.

Understanding the diverse needs of the many and varied ITS stakeholders was a prerequisite for successful development of an architecture that met the requirements laid out by the set of ITS User Services, as described in the National ITS Program Plan. The DOT and the contractors on this effort have been, and will continue to, work cooperatively to gauge and foster consensus on a nationwide deployment scenario for ITS, as advocated by the architecture development program. The partnership of contractors and DOT is referred to as the Consensus Building and Outreach Team.

Services provided under this contract included: working with DOT and architecture development contractors to develop material appropriate for outreach; arranging and facilitating task force and focus group meetings to discuss architecture, standards, and deployment issues identified by the architecture development program; coordination with the various State and Regional ITS Chapters to encourage their involvement in the process of determining stakeholders' concerns; and all general planning, advisory, and coordination support needed to accomplish the objectives of the consensus-building effort, namely: (1) to maximize responsiveness to concerned stakeholder groups; (2) to maximize coverage of the country; and (3) to schedule and execute activities in a timely manner to aid the architecture development contractors in producing each successive refinement of their products.

Project Location: Washington, DC

Contractor(s): Part of this effort has been incorporated as part of the ITS America cooperative agreement. Other pieces of the program will be executed as separately funded task orders with ITS America, TRESP & Associates, and others during the course of the program.

Start Date: October 1992

***End Date*:** July 1996

Estimated Total ITS Funds: $1,500,000

Estimated Total Project Cost: $1,500,000

***Contacts*:**

William Jones	FHWA ITS JPO, HOIT	(202) 366-2128

X. MAINSTREAMING

X. MAINSTREAMING

The eight program strategies used by the National ITS Program to advance deployment and integration of ITS across the nation are identified in Chapter I Introduction, and summarized in Chapter II Metropolitan ITS Infrastructure. Projects developed in support of these strategies are described throughout preceding chapters.

This chapter incorporates projects supporting the eight National ITS Program strategies, but not addressed in previous sections. Additionally, this chapter serves to identify an extensive program of early deployment planning projects conducted during the period authorized by the Intermodal Surface Transportation Efficiency Act of 1991.

A. Deployment Planning

The existing planning and programming process for transportation improvements is well-established, and includes procedures for considering an area's long-range needs, environmental issues, and creation of a specific program of projects for funding. In order to bring about meaningful contributions to transportation improvements, ITS technology applications must be integrated into the range of alternatives considered in the transportation planning process. In order to establish the foundations for routine incorporation of ITS technologies in local and regional planning processes, U.S. DOT sponsored an extensive program of early deployment planning studies during the ISTEA era. These studies provided communities with an opportunity to develop an integrated view of near-to-mid term deployment planning. Ninety of these early deployment planning studies have been completed. Other projects in this chapter include planning initiatives started under the TEA-21 Deployment Program, and projects making major contributions to the overall strategy for advancing, or "mainstreaming" ITS in the transportation community.

B. Deployment Support

Deployment support objectives include: (1) bringing together, in a series of workshops, public and private sector professionals to discuss practical solutions to problems which may be encountered in the deployment of ITS; (2) providing technical assistance through information exchange in peer-to-peer workshops and through technology transfer; and (3) identifying and carrying out activities needed to effectively promote ITS in the state and metropolitan planning processes, educating the ITS community as to how those processes work, and educating those involved in regional planning regarding ITS.

C. Professional Capacity Building (PCB)

In order to support the deployment of ITS, it is imperative that the knowledge, skills and abilities of transportation professionals at a variety of institutional levels be expanded relative to ITS. Focusing on federal employees and state and local professionals, the Professional Capacity Building (PCB) program supports the National ITS Program by:

- Increasing knowledge about ITS benefits and deployment options among decision makers;

- Expanding the technical skills and abilities of agencies responsible for implementing ITS as well as those responsible for support;
- Sensitizing officials to integration and institutional issues, and providing strategies for addressing them;
- Developing a comprehensive and readily accessible education and training infrastructure at multiple levels, including colleges, universities, public agencies, and commercial providers.

Early Deployment Planning

ITS STRATEGIC PLAN, BUSINESS PLAN, INTEGRATION DEMONSTRATION & INDIAN NATIONS COUNCIL OF GOVERNMENTS INITIAL DEPLOYMENT STUDY

Description:

This project is one component of the FY 2001 ITS Integration Program earmark for the State of Oklahoma. The project will undertake three related subprojects as follows:

- Develop a Statewide ITS Architecture and Plan.
- Prepare an Initial Deployment Study for the Tulsa Metropolitan Area.
- Integrate components and systems of the Oklahoma City Area Regional Transportation Study (OCARTS) area, the Oklahoma Department of Public Safety (DPS) and the Oklahoma Department of Transportation (ODOT) for an ITS Demonstration Project.

The Demonstration Project will integrate arterial management systems and freeway management systems managed by ODOT and Oklahoma City through a fiber optic backbone which will fuse data in an interim ODOT Traffic Operations Center.

Project Location: State of Oklahoma

Partner(s): FHWA, Oklahoma DOT, Oklahoma Department of Safety/Oklahoma Highway Patrol, INCOG, ACOG

Start Date: September 2001

***End Date*:** June 2003

Estimated Total ITS Funds: $593,615

Estimated Total Project Cost: $1,184,000

***Contacts*:**

Richard Jurey	FHWA Oklahoma Division, HDA-OK	(405) 605-6040	Ext. 323
David Streb	Oklahoma DOT	(405) 521-6916	

Deployment Support

ITS PROFESSIONAL CAPACITY BUILDING

Description:

The purpose of the Professional Capacity Building (PCB) program is to provide essential training for Federal, State and local agency professionals, for elected officials, and for the general public concerning the deployment of Intelligent Transportation Systems. The PCB program sponsors and directs the development of, primarily, short courses that run the gamut from overviews that generate interest and provide general understanding to technical courses that convey specialized and detailed information. Curriculum and course needs are established by consulting regularly with the whole spectrum of ITS stakeholders.

The goal of the PCB program is: (1) to make it possible for elected officials and the general public to understand the value and applications of ITS components and (2) to enhance the probability that there will be sufficient numbers of trained U.S. DOT, State and local ITS professionals in place nationwide. The program strives to develop courses and course materials that are well designed instructionally as well as technically accurate and up-to-date. A major effort is underway to make training available to a broader base of stakeholders by taking advantage of new technology and developing partnerships with universities and professional organizations.

In some cases, traditional classroom training is giving way to distance learning over the Web. Going forward, it is anticipated that the PCB program will offer more and more Web-based training opportunities. Web-based training makes it possible for all organizations and individuals to get "just in time" training that is tailored to their needs.

The PCB program will continue to work with the National Highway Institute (NHI), the National Transit Institute (NTI), the Consortium of ITS Training and Education (CITE) and others to broaden and strengthen the ITS curriculum as well as enhance the accessibility of training, technical assistance and information. There are more than 30 ITS courses currently available through the PCB program and its partners. Five PCB courses, including several transit ITS courses, were updated in 2002 and five others will be modified in the first half of 2003. Three new courses on systems engineering will be rolled out in early 2003. New courses on rural ITS deployment and road weather management will be ready in early 2003 as well. A new, and very successful, workshop on the installation of fiber optics along freeways was developed in 2002. Other new courses plus more robust technical assistance and outreach activities continue to be added to the completely refurbished PCB Web site (www.pcb.its.dot.gov). The Web site will serve as a portal to a wide variety of training, education, technical assistance and information opportunities. The PCB program will continue to look for, and incorporate where feasible, new and innovative methods for getting the latest information and guidance out to the customers.

This is a multi-year program. The funding level depicted below reflects FY 2002 outlays.

Project Location: Washington, DC; FHWA Resource Centers and Division Offices, FTA Region Offices, State and Local government agencies

Contractor(s): Various

Start Date: September 1996

***End Date*:** Ongoing

Estimated Total ITS Funds: $3,453,000

Estimated Total Project Cost: $3,453,000

Contacts:

Ron Giguere	FHWA ITS JPO, HOIT	(202) 366-2203
Eloise Freeman	FHWA National Highway Institute	(703) 235-0553
Helen Tann	FTA Headquarters, TRI-11	(202) 366-0207

NDOR ITS INTEGRATION INITIATIVE OUTREACH AND MARKETING PLAN

Description: This project is a component of the FY 2000 ITS Integration Program State of Nebraska earmark. The purpose of this project is to expand awareness of ITS-related activities and the potential impacts and benefits of ITS to stakeholders and consumers in the State of Nebraska. The project scope includes developing a series of tools that will inform and educate public and private stakeholders on existing and planned ITS deployment activities.

Project Location: Nebraska

Partner(s): FHWA, Nebraska Dept. of Roads

Start Date: May 2001

***End Date*:** March 2003

Estimated Total ITS Funds: $39,000

Estimated Total Project Cost: $83,500

***Contacts*:**

Milo Cress	FHWA Nebraska Division, HDA-NE	(402) 437-5977
James Pearson	Nebraska Dept. of Roads	(402) 479-3812

NIAGARA INTERNATIONAL TRANSPORTATION TECHNOLOGY COALITION

Description:

Using a revolving loan fund to finance the NITTEC Program, the many agencies and jurisdictions which own and operate the Niagara River Border Crossings and the major approaches to those crossings will establish a multiagency transportation coordination and management council to:

a) Develop regionally compatible travel information and traffic management strategies (e.g., non-stop electronic customs processing, ETTM);

(b) Establish a Regional Transportation Management Center to monitor regional traffic and coordinate traffic management strategies (e.g.,incident management and tourist/travel information service); and

(c) Help finance operating and capital improvements by operating agencies to expedite the movement of traffic across and to the border.

Project Location: Buffalo/Niagara Region

Partner(s): New York State DOT, New York Thruway Authority, Niagara Falls Bridge Commission, Buffalo and Fort Erie Peace Bridge Authority, Ministry of Transportation Ontario, and other local agencies

Start Date: December 1995

***End Date*:** Ongoing

Estimated Total ITS Funds: $2,500,000

Estimated Total Project Cost: $5,000,000

***Contacts*:**

Jerry Zell	FHWA - New York Division HTS-NY	(518) 431-2125	Ext. 228
Tim Roach	New York State DOT, NITTEC TOC	(716) 847-2450	

Completed Projects

Completed Projects – Early Deployment Planning

The state and local jurisdictions listed below have completed early deployment planning studies. In all cases, the project objectives were to develop and document an integrated, multimodal, areawide ITS multi-year strategic deployment plan for the implementation of ITS user services in the study area or along a corridor.

Project Title	End Date
Akron, Ohio Metropolitan Area Early Deployment Planning Study	November 1999
Allentown/Bethlehem/Easton, Pennsylvania Early Deployment Planning Study	April 2000
Atlanta, Georgia Areawide Early Deployment Planning Study	March 1998
Austin, Texas Areawide Early Deployment Planning Study	March 1998
Baltimore, Maryland Early Deployment Planning Study	June 2001
Baton Rouge, Louisiana Early Deployment Planning Study	September 1998
Birmingham, Alabama Areawide Early Deployment Planning Study	January 1996
Boston, Massachusetts Areawide Early Deployment Planning Study	January 1994
Buffalo/Niagara Falls, New York Areawide Early Deployment Planning Study	June 1997
Charleston, South Carolina Areawide Early Deployment Planning Study	June 1997
Charlotte, North Carolina Areawide Early Deployment Planning Study	December 1993
Chicago, Illinois Areawide Early Deployment Planning Study	June 1999
Cleveland, Ohio Areawide Early Deployment Planning Study	October 1996
Columbus, Ohio Early Deployment Planning Study	August 1997
Dallas, Texas Areawide Early Deployment Planning Study	October 1996
Dayton/Springfield, Ohio Areawide Early Deployment Planning Study	September 1997
Denver, Colorado Areawide Early Deployment Planning Study	April 1993
Denver, Colorado Preliminary Engineering Early Deployment Planning Study	June 1997
Des Moines, Iowa Areawide Early Deployment Planning Study	December 1997
Detroit, Michigan Areawide Early Deployment Planning Study	October 1994
El Paso, Texas Early Deployment Planning Study	December 1998
Fort Lauderdale, Florida Areawide Early Deployment Planning Study	March 2000
Fort Worth, Texas Early Deployment Planning Study	July 1998
Fresno, California Early Deployment Planning Study	October 1998
Garden State Parkway, New Jersey Early Deployment Planning Study	February 1998
Grand Rapids, Michigan Areawide Early Deployment Planning Study	August 1996
Greensboro, North Carolina Corridor Early Deployment Planning Study	August 1994
Greenville, South Carolina Areawide Early Deployment Planning Study	March 1996
Hampton Roads, Virginia Areawide Early Deployment Planning Study	October 1995
Harrisburg/Lebanon/Carlisle, Pennsylvania Early Deployment Planning Study	January 2000
Hartford, Connecticut Areawide Early Deployment Planning Study	April 1998
Honolulu, Hawaii Early Deployment Planning Study	April 1997
I-5 Seattle To Vancouver, BC and I-90 Seattle To Spokane, Washington Early Deployment Planning Study	September 1997
I-10 New Orleans, Louisiana To San Antonio, Texas Early Deployment Planning Study	August 1998
I-40 Northern Arizona Early Deployment Planning Study	June 1997
I-70 Denver, Colorado Corridor Early Deployment Planning Study	July 1996
I-71 Corridor Between Columbus and Cleveland Early Deployment Planning Study	August 1998
I-79 Erie To Washington, Pennsylvania Early Deployment Planning Study	June 1997
I-84 Portland, Oregon To Boise, Idaho Early Deployment Planning Study	September 1997
I-94 Milwaukee To Minneapolis and I-90 Beloit To Lacrosse Early Deployment Planning Study	May 1997
Indianapolis, Indiana Areawide Early Deployment Planning Study	July 1996
ITS Strategic Plan For Maricopa County - Phoenix Area	January 1996
Jacksonville, Florida Early Deployment Planning Study	February 1998
Kansas City, Missouri-Kansas Areawide Early Deployment Planning Study	March 1996
Kern County, California Early Deployment Planning Study	July 1997

Knoxville, Tennessee Early Deployment Planning Study	September 1998
Las Vegas, Nevada Areawide Early Deployment Planning Study	December 1996
Lexington, Kentucky Early Deployment Planning Study	February 1997
Los Angeles/San Diego, California Corridor Early Deployment Planning Study	June 1998
Louisville, Kentucky Areawide Early Deployment Planning Study	August 1994
Lower Hudson Valley/White Plains, New York Early Deployment Planning Study	November 1998
Memphis, Tennessee Early Deployment Planning Study	July 1998
Nashville, Tennessee Early Deployment Planning Study	July 1997
National Capital Metro Area (Umbrella) Early Deployment Planning Study	April 1997
New Castle County, Delaware Early Deployment Planning Study	August 1998
New Haven-Meriden, Connecticut Early Deployment Planning Study	February 1999
New Orleans, Louisiana Areawide Early Deployment Planning Study	March 1997
New York City, New York Early Deployment Planning Study	February 2000
Newark, New Jersey Early Deployment Planning Study	September 1999
Northern Virginia/Washington, D.C. Area Early Deployment Planning Study	May 1996
Oklahoma City, Oklahoma Areawide Early Deployment Planning Study	October 1998
Omaha, Nebraska Areawide Early Deployment Planning Study	December 1997
Orange County, California Early Deployment Planning Project	March 1996
Orlando, Florida Early Deployment Planning Study	June 1998
Pennsylvania Turnpike Corridor Early Deployment Planning Study	February 1996
Philadelphia, Pennsylvania Institutional Coordination Study	December 2000
Pittsburgh, Pennsylvania Areawide Early Deployment Planning Study	March 1994
Portland, Maine Early Deployment Planning Study	March 1998
Portland, Oregon Areawide Early Deployment Planning Study	January 1995
Providence, Rhode Island Areawide Early Deployment Planning Study	May 1997
Raleigh/Durham/Chapel Hill, North Carolina Areawide Early Deployment Planning Study	April 1997
Richmond, Virginia Areawide Early Deployment Planning Study	October 1996
Rochester, New York Areawide Early Deployment Planning Study	May 1996
Sacramento, California Early Deployment Planning Study	August 1996
Salt Lake City, Utah Areawide Early Deployment Planning Study	March 1997
San Antonio, Texas Early Deployment Planning Study	September 1998
San Diego Border Crossing Early Deployment Planning Study	July 1998
San Francisco Bay Area Early Deployment Planning Study	August 1996
San Juan, Puerto Rico Areawide Early Deployment Planning Study	May 1999
Scranton/Wilkes-Barre, Pennsylvania Early Deployment Planning Study	July 1997
Seattle, Washington To Portland, Oregon Corridor Early Deployment Planning Study	March 1996
Springfield, Massachusetts Early Deployment Planning Study	January 1999
St. Louis, Missouri Areawide Early Deployment Planning Study	May 1994
Syracuse, New York Early Deployment Planning Study	December 2002
Tampa, Florida Areawide Early Deployment Planning Study	October 1993
Toledo, Ohio Early Deployment Planning Study	November 1999
Tucson Advanced Transportation Technologies Implementation Plan	July 1996
Washington, D.C. Early Deployment Planning Study	November 1998
Wichita, Kansas Early Deployment Planning Study	July 1998
Youngstown-Warren, Ohio Early Deployment Planning Study	January 2000

DEVELOPMENT OF ADVANCED EDUCATIONAL TECHNIQUES FOR ITS

Description: This project developed three training courses. Target audiences were identified, and training objectives developed in cooperation with the National Highway Institute (NHI) identified experts. Advanced ITS tools were utilized in developing and presenting the courses. The training courses were coordinated with related courses under development by NHI and the JPO.

Project Location: Troy, New York

Contractor(s): Rensselaer Polytechnic Institute

Start Date: October 1998

***End Date*:** November 2000

Estimated Total ITS Funds: $494,646

Estimated Total Project Cost: $593,575

***Contacts*:**

David Gibson	FHWA - TFHRC, HRDO-04	(202) 493-3271
William Wallace	Rensselaer Polytechnic Institute	(518) 276-6854
Harry Mersey	FHWA, National Highway Institute	(703) 235-0525

EVALUATION OF TELECOMMUNICATIONS COST OF OWNERSHIP VERSUS COST OF LEASING TRADEOFF

Description:

The State of Maryland has conducted a detailed study to define its telecommunications requirements for the deployment of ITS throughout the State. This project provided a number of design options for their telecommunications, and conducted a detailed life cycle cost analysis of these options to determine if it should lease or own this infrastructure. In addition, Maryland has examined the relative value of various video quality levels to be used in their CCTV network surveying the roadways. They concluded that compressed video was acceptable to perform the required functions. This decision has a major impact on the cost of telecommunications. This project has been extended to produce both summary and detailed documentation on their results as well as the methodology, and to provide a video on the relative merits of compressed versus broadcast quality video. Finally, Maryland and their contractor have prepared a one day seminar on lessons learned in the telecommunications study, which are available on request from the ITS JPO:

(1) "A Case for Intelligent Transportation (ITS Telecommunications Analysis)," FHWA-JPO-97-0015

(2) "ITS Telecommunications: Public or Private? A Cost Tradeoff Methodology Guide," FHWA-JPO-97-0014

Project Location: Maryland

Contractor(s): Computer Sciences Corporation

Start Date: October 1995

***End Date*:** December 1997

Estimated Total ITS Funds: $325,000

Estimated Total Project Cost: $435,000

***Contacts*:**

William S. Jones	FHWA ITS JPO, HOIT	(202) 366-2128
Alisoun Moore	Maryland State Highway Administration	(410) 685-1040

INCORPORATING ITS INTO REGIONAL TRANSPORTATION PLANNING

Description:

This four-year study began by examining current transportation planning methods used by MPOs and implementing agencies to address ITS deployment, particularly in the alternatives analysis stage. If such methods are inadequate, new approaches were to be developed. The resulting methods were applied to two case studies. The case studies covered an area or region, rather than a single traditional project. The range of transportation improvement projects considered included construction of new roads or lane miles, conventional signage or signal installations, transit improvements, Transportation Demand Management (TDM) measures, Advanced Traveler Information Systems, Advanced Traffic Management Systems, and Advanced Public Transportation Systems.

Phase I of this project was completed on 30 June 1996. The two cases studied were Houston, TX, and Seattle, WA. An analysis of the approach and methods used by the MPO's in these areas to select among projects as part of the Transportation Improvement Process (TIP) was conducted. A report was produced that documented this process and provided some recommendations for how to deal with ITS projects as part of the TIP. Based on the results of this phase the Seattle area was selected for a more detailed analysis of how to include and evaluate ITS enhancements to traditional highway construction projects. In Phase II, Mitretek initiated a modified Major Investment Study (MIS) type analysis to develop methods and techniques to evaluate transportation improvement alternatives, including alternatives with ITS enhancements. As part of Phase II, the analysis framework was defined and published in two reports, "Incorporating ITS into Corridor Planning Seattle Case Study," (March 1998). The Phase II report was revised based on comments received from DOT. This study was completed in August 1999 with finalizing the analysis results and a report on these methods for use by transportation planners.

Project Location: Washington, DC

Contractor(s): Mitretek Systems

Start Date: July 1995

***End Date*:** August 1999

Estimated Total ITS Funds: $1,613,000

Estimated Total Project Cost: $1,613,000

***Contacts*:**

William Jones	FHWA ITS JPO, HOIT	(202) 366-2188

ITS/CVO MAINSTREAMING PROJECTS

Description:

Since 1992, every State except Hawaii has participated in an ITS/CVO institutional issues study. These individual and multi-State studies provided forums for State regulatory agencies and representatives from the motor carrier industry to identify opportunities to streamline compliance functions with ITS/CVO technology applications. Now that the barriers to ITS/CVO deployment have been identified, the States are moving towards the next stage - ITS/CVO Mainstreaming.

Mainstreaming means moving ITS/CVO services beyond concept development and testing into operation. The basic building block for the ITS/CVO program is the State; however, State CVO programs must be developed in the context of regional CVO programs that serve the nation's major trucksheds. Most truck trips are under 200 miles from home base and are concentrated within major population and economic regions, which can be defined as 7 regional platforms (SE, SW, MW, NE, NW, W, and Great Lakes). The CVO program must establish and maintain regional CVO forums aligned with these trucksheds to ensure that CVO services are delivered where the trucks are, and that services within trucksheds are relatively uniform from the carrier's perspective.

This program had many functions: 1) the support of State officials (including DOT, DMV, State Patrol, DOR officials, etc.) and motor carriers (especially smaller motor carrier firms) participation in regional ITS/CVO forums, 2) the analysis of benefits and costs of ITS/CVO technologies to individual State agencies as well as motor carriers, 3) the development of ITS/CVO business plans for regional platforms as well as individual States, and 4) the facilitation of State-and region-wide long term deployment of proven ITS/CVO technologies. Funds also supported full-time, regional champions who coordinated and conveyed the purposes, technologies, costs, and benefits of ITS/CVO activities at the states to legislatures, business, and the public.

There are seven CVO Mainstreaming projects comprised of 33 States. Several states are seeing the benefits of joining multiple regional mainstreaming consortia to ensure that their individual state mainstreaming activities are synchronized with neighboring states. The Regional Consortia (with lead states identified) are as follows:

I-95 Coalition/Northern: NJ* (Lead) MA, CT, RI, ME
I-95 Coalition/Eastern: NJ* (Lead), WV*, VA*, MD, DE, NY, PA
Advantage CVO/Southeastern: KY* (Lead), NC, TN, GA, LA, VA*
Advantage CVO/Great Lakes: KY* (Lead), OH, IN, MI, MN, WI, WV*
Mississippi Valley: MO--Lead, KS, NE, SD
Northwestern: WA--Lead, ID, MT, WY, UT*
Western: OR--Lead, CA, UT*, CO

* Designates states participating in more than one regional consortium.

Project Location:

As reflected in the description of the Regional Consortia.

Contractor(s):

Various

Start Date:

January 1992

***End Date*:** May 1998

Estimated Total ITS Funds: $7,230,000

Estimated Total Project Cost: $13,220,000

Contacts:

Jeff Loftus	FMCSA, MC-RTT	(202) 358-5651

ITS/CVO TECHNOLOGY TRUCK

Description: The purpose of the ITS/CVO technology truck project was to create a national demonstration project -- using an 18-wheeler designed and constructed to house portable ITS technology, classroom-type facilities, and informational kiosks -- in the areas of CVO designed to demonstrate, educate, and inform state agencies and motor carrier communities regarding the technologies and potential benefits of the ITS/CVO program. The program also served as a method of introducing ITS/CVO technology to the secondary audiences -- motor carrier safety enforcement officers, motor vehicle operators (truck/bus drivers), transportation students and the general public by providing hands-on demonstrations as well as interactive, multi-media based informational presentations.

Project Location: Oak Ridge, Tennessee

Contractor(s): Oak Ridge National Laboratory

Start Date: February 1995

***End Date*:** June 2000

Estimated Total ITS Funds: $1,600,000

Estimated Total Project Cost: $1,600,000

***Contacts*:**

Zeborah English	FMCSA, MC-RTT	(202) 358-5671

ITS/CVO TRAINING

Description:

The primary objective of this effort was to plan, develop, implement and update ITS/CVO training courses. These courses provided ITS/CVO state, federal and private managers and implementers with the skills and knowledge necessary to accomplish the ITS/CVO Mission and Goals. ITS/CVO training curriculum consisted of two broad areas: project management skills development and technical skills development. Upon completion of these courses, participants were able to:

* Understand and articulate the ITS/CVO Program's Vision, Mission and Program Goals and Objectives;

* Understand the standards and procedures for ITS/CVO program funding, development, testing and deployment along with operations and technology maintenance requirements;

* Understand the institutional issues or barriers to program success, and promote the importance of the non-technical agreements which are critical for a state to develop, thus ensuring successful long-term technology deployment;

* Understand the technical issues in the areas of communication technologies, system integration, and technology standards, as well as the strategies necessary to deploy these technologies;

* Understand the requirements for implementation of strategies designed to ensure cooperation among state partners, and serve as a catalyst for further efforts toward deployment of ITS/CVO technologies.

A basic management course is the first in a series of courses which will help create uniformity and standardization in reaching common goals and objectives among ITS/CVO partners and stakeholders. This course was available in the spring of 1997. Technical courses will provide federal and state personnel with the skills necessary to effectively deploy, operate and evaluate ITS/CVO technologies that enhance public safety and are cost-effective, user friendly, and interoperable with existing public and private information systems. Technical courses were available in the fall of 1997. Both management and technical courses will be updated regularly.

Project Location: Washington, D.C.

Contractor(s): MELE & Associates, JHU/Applied Physics Laboratory, Booz-Allen & Hamilton

Start Date: October 1995

***End Date*:** September 1998

Estimated Total ITS Funds: $2,000,000

Estimated Total Project Cost: $2,000,000

Contacts:

Zeborah English	FMCSA, MC-RTT	(202) 358-5671
Gladys Cole	FMCSA National Training Center, HPS-20	(703) 235-0501

PROCUREMENT FOR ITS

Description: The objectives of this project were to (1) identify and analyze contracting issues which have arisen or are likely to arise in the development and deployment of ITS and which may be constraining or hampering the implementation of ITS technologies and (2) develop legally sound, innovative models for contracting for ITS technologies by State and local contracting agencies. The research effort included 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. A final report titled "Innovative Contracting Practices for ITS" has been produced.

Project Location: Cambridge, Massachusetts

Contractor(s): L. S. Gallegos & Associates

Start Date: October 1994

***End Date*:** December 1996

Estimated Total ITS Funds: $312,684

Estimated Total Project Cost: $312,684

***Contacts*:**

William Jones	FHWA ITS JPO, HOIT	(202) 366-2128

SHARED RESOURCES PROJECT

Description:

A number of state and local transportation authorities have formed partnerships with telecommunications companies to exchange access to public roadways for telecommunications capacity to be used principally for ITS projects. This report examines the legal and institutional issues encountered by a number of these partnerships. After completing the research for wireline telecommunications, the study was extended to examine these same issues when wireless tower sites are the subject of location on public rights-of-way. The results of these two analyses have been published in three reports. "Shared Resources: Sharing Right-of-Way for Telecommunications;--Guidance on Legal and Institutional Issues" and the "Final Report." FHWA-JPO-96-0015 & 14. The third report is "Wireless Shared Resources: Sharing Right-of-Way for Wireless Telecommunications," FHWA-JPO-97-0024. These reports are available from the ITS Joint Program Office.

The JPO is providing workshops to public agencies on these subjects on a request basis.

Project Location: Bethesda, Maryland

Contractor(s): Apogee Research, Inc.

Start Date: September 1994

***End Date*:** December 1997

Estimated Total ITS Funds: $460,000

Estimated Total Project Cost: $701,723

***Contacts*:**

William Jones	FHWA ITS JPO, HOIT	(202) 366-2128

XI. OTHER RELATED PROGRAMS

XI. OTHER RELATED PROGRAMS

This section documents completed projects funded with Federal ITS dollars but which do not conform to any of the other categories in this ITS projects report.

Research

ITS RESEARCH CENTERS OF EXCELLENCE

Description:

ITS Research Centers of Excellence (RCE's) program mission is to establish internationally recognized centers of excellence that provide long term ITS research solutions, promote ITS technologies and prepare ITS professionals to build and operate these intelligent transportation systems. The centers provided approximately $1,500,000 in matching funds each year of the program. Over one hundred students are working in RCE-related projects at the centers. Areas of emphasis are as follows:

University of Michigan:

Seven major areas define the University of Michigan Center's focus on near term, pre-competitive aspects of ITS: Information Technology, Controls Technology, Enterprise/Institutional Issues, Traffic Modeling, Human Factors and Behavior, Evaluation and Fleet Management. Research activity was completed at the end of CY 2000.

Texas A & M:

The Texas A&M Center focuses on Public Transportation Services, Traffic Management Services and International Border Transportation Services. Research activity at the Texas Transportation Institute has transitioned from this project to TransLink. This contract was extended to complete projects conducted under TransLink.

Virginia Polytechnic Institute:

The Virginia Polytechnic Institute Center focuses on Incident Management, Automated Highway Systems, Smart Highways (sensors/communications), Advanced Traveler Information Systems, and Advanced PublicTransportation Systems. Research activity was completed at the end of CY 2000. This contract was extended to provide additional support for TRANSIMS.

A report titled "The ITS Research Centers of Excellence Program" may be obtained by contacting:
ITS RCE Clearinghouse
Texas Transportation Institute
The Texas A&M University System
College Station, Texas 77843-3135
Tel: (409) 845-1734

The RCE Information Clearinghouse can be accessed via the internet at http://rce.tamu.edu/.

Project Location:

Ann Arbor, Michigan; College Station, Texas; and Blacksburg, Virginia

Partner(s):

University of Michigan, Texas A&M University, and Virginia Polytechnic Institute

Start Date: September 1993

***End Date*:** December 2003

Estimated Total ITS Funds: $15,400,000

Estimated Total Project Cost: $15,400,000

***Contacts*:**

David Gibson	FHWA - TFHRC HRDO-04	(202) 493-3271

Completed Projects

AUTOMATED TRAVEL TIME ACQUISITION PROTOTYPE

Description:

This project involved the design, development, and testing of a prototype device for automating traffic speed and travel time surveys. The device makes use of a commercial off-the-shelf GPS receiver and a laptop computer in a moving vehicle. It acquires speed and location information in real time and generates time vs. distance and speed vs. distance plots. Data can be stored for subsequent playback and analysis. The device is highly portable and can be installed in a vehicle in a matter of minutes.

A prototype was built and laboratory testing successfully completed. Field testing was carried out on suburban and urban freeways and arterials. The results agree with those obtained manually and with those obtained using commercial devices hard-wired to the transmission. Furthermore, the continuous stream of position data generated by the device was found to offer a number of advantages over manually-collected "point" data. Efforts are underway to support field application of the device by the Metropolitan Washington Council of Governments and other state and local jurisdictions.

Project Location: Washington, DC

Contractor(s): Mitretek Systems

Start Date: April 1995

***End Date*:** June 1996

Estimated Total ITS Funds: $141,000

Estimated Total Project Cost: $141,000

***Contacts*:**

Raj Ghaman	FHWA TFHRC, HRDO-03	(202) 493-3270

ITS IDEA PROGRAM

Description:

The Innovations Deserving Exploratory Analysis Program solicited "IDEAs" for and funded feasibility studies of high-risk, innovative Intelligent Transportation Systems (ITS) concepts. Concepts which show continuing promise may move to phase II funding support, wherein prototype development can occur. The objective of this initiative was to establish a continuing program to identify and explore innovative concepts for ITS that are proposed by individual researchers both within and outside the usual transportation research community. This intermodal ITS program was supported by the Federal Highway Administration in the amount of $6.5 million. Additionally, the National Highway Traffic Safety Administration and the Federal Railroad Administration contributed $2 million and $1 million respectively to program support.

A progress report titled "Emerging Concepts and Products for Intelligent Transportation Systems" may be obtained by contacting:

Intelligent Transportation Systems
Innovations Deserving Exploratory Analysis (IDEA) Program
Transportation Research Board, National Research Council
2101 Constitution Avenue, N.W.
Washington, D.C. 20418
Tel: (202) 334-3568

Additional information on the ITS IDEA Program can be found on the internet at www.nas.edu/trb/about/itslist.html

Project Location: Washington, DC

Partner(s): Transportation Research Board and National Academy of Sciences

Start Date: September 1992

***End Date*:** December 1999

Estimated Total ITS Funds: $9,500,000

Estimated Total Project Cost: $9,500,000

***Contacts*:**

David Gibson	FHWA - TFHRC, HRDO-04	(202) 493-3271

NATIONAL ADVANCED DRIVING SIMULATOR (NADS)

Description: The objective of this NHTSA project was to develop a design for 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 enables researchers to conduct multi-disciplinary investigations and analyses on a wide range of issues associated with traffic safety, highway engineering, Intelligent Transportation Systems (ITS), human factors, and motor vehicle product development. This project was completed in November 2001. The simulator is operational.

Project Location: Iowa City, Iowa

Contractor(s): TRW, Inc.

Start Date: February 1996

***End Date*:** November 2001

Estimated Total ITS Funds: $40,000,000

Estimated Total Project Cost: $40,000,000

***Contacts*:**

John Machey	NHTSA Headquarters, NRD-52	(202) 366-5665

NATIONAL AVIATION & TRANSPORTATION CENTER

Description: This project supported the implementation and evaluation of an International Intermodal Transportation Simulation System and NAFTA Intermodal Transportation Institute at the National Aviation and Transportation Center/Dowling College on Long Island.

Project Location: Long Island, New York

Partner(s): New York State DOT and Dowling College

Start Date: September 1995

***End Date*:** July 1999

Estimated Total ITS Funds: $6,370,000

Estimated Total Project Cost: $7,962,500

***Contacts*:**

Mike Schauer	FHWA New York Division, HTD-NY	(518) 431-4125	Ext. 236
Ed Roberts	New York State DOT	(518) 457-1232	

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Note: Following selected project titles below, state locations identify TEA-21 earmarked projects and state and city locations identify metropolitan area field operational tests.