



Research, Development, and Technology

Fiscal Year 2006

Research Project Status Summary

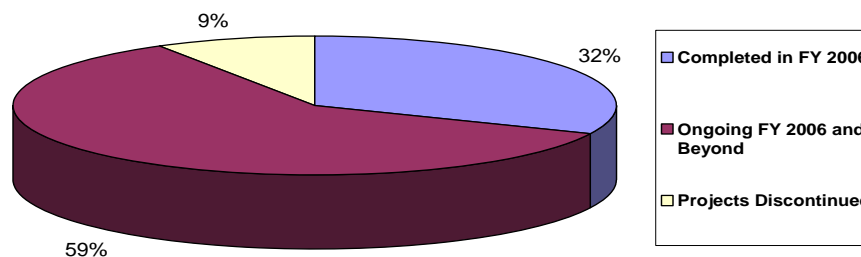
May 2007

FHWA-HRT-07-049

FISCAL YEAR 2006 RESEARCH PROJECT STATUS SUMMARY

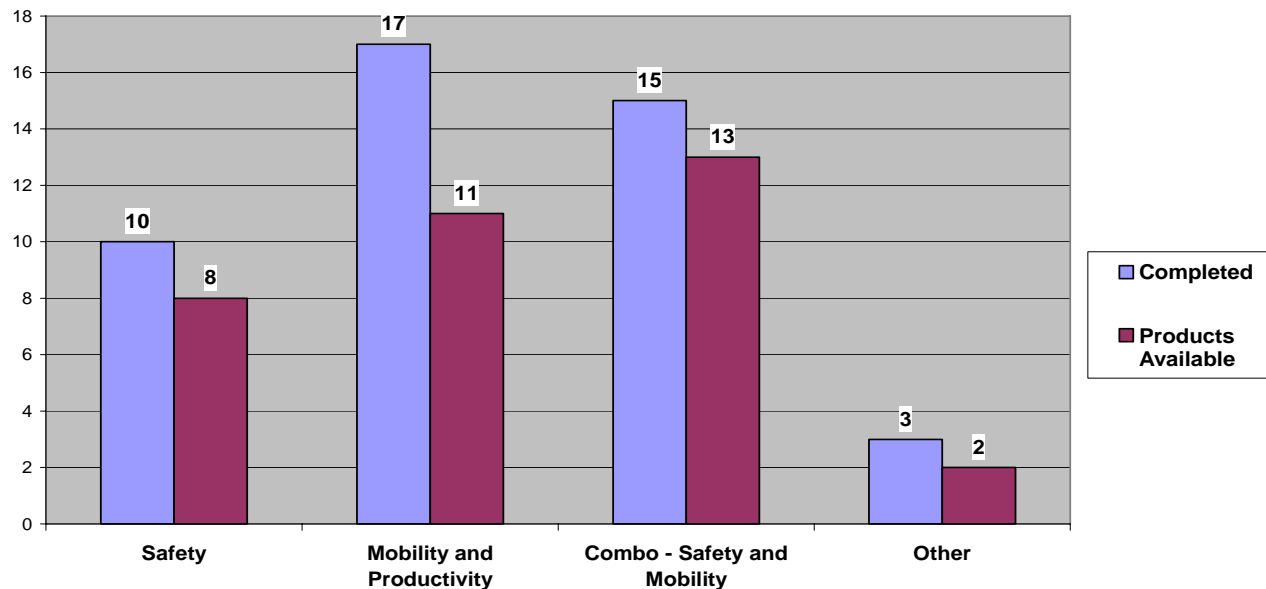
The following tables and charts reflect the Federal Highway Administration (FHWA) Office of Research, Development, and Technology's (RD&T) fiscal year (FY) 2006 progress in conducting the program of research identified in the [Research, Development, and Technology Performance Plan: Fiscal Year 2006–2007](#) (FHWA-HRT-06-037). FHWA is publishing this information as part of its commitment to hold themselves accountable publicly for carrying out its research plan. During FY 2006, researchers at the Turner-Fairbank Highway Research Center (TFHRC) conducted 127 research projects that support the Agency's strategic goals of [Safety, Mobility and Productivity, Global Connectivity, Environment, National Homeland Security, and Organizational Excellence](#). Of the total number of projects, 44 were completed by FY end, and 83 projects are ongoing. Eighty percent of the total number of projects were on schedule. For those research projects that were not on schedule in FY 2006, delays were due to staff changes and delayed availability of funds. Twelve projects in the original plan will not be conducted due to lack of funds and revised priorities. Fifteen projects that were unanticipated when the FY 2006/2007 performance plan was developed were added to the table. These 15 projects were identified as priorities based on stakeholder input following the passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

**Current and Future Project Distribution
(End of FY 2006)**



Of the 44 projects completed in FY 2006, 10 projects primarily supported the Agency's strategic goal of Safety, and 17 projects primarily supported the Mobility and Productivity goal. As indicated in the chart, FY 2006 Projects Completed and Products Available by Goal, several projects supported multiple goals, including Environment and National Homeland Security. Fifteen projects supported the combined goals of Safety, and Mobility, and Productivity.

FY 2006 Projects Completed and Products Available by Goal



In response to the Congestion Relief Initiative announced by Secretary Norman Y. Mineta in May 2006, seven projects were completed in support of the Department's congestion mitigation goal, including: the *Coordinated Freeway and Arterial Operations Handbook*; *Traffic Analysis Toolbox Volume IV: Guidelines for Applying CORSIM Microsimulation Modeling Software*; NGSIM—Cooperative Lane Changing and Forced Merging Model; *Ramp Management and Control Handbook*; *Traffic Detector Handbook*; Adaptive Control System (ACS) Lite Software; and *Maintenance Decision Support System* publication and software, Release 4.

Other notable accomplishments in FY 2006 include 42 new products resulting from FHWA research, which are now available to customers and stakeholders. Of these products, 32 represent completed projects. For more information about these products or any of our research projects, the summary tables include contact names and telephone numbers.

RD&T Performance Measures Summary

The following chart depicts performance measures that FHWA updates annually as a component of the Office of Management and Budget's (OMB) Program Assessment Rating Tool (PART) for Federal research and development (R&D) programs.

Measure	Target (2006)	Actual (2006)
Number of deliverable research products, innovations, and technologies that support the accomplishment of the Department of Transportation (USDOT) and FHWA safety goals.	5	19
Number of deliverable research products, innovations, and technologies that support the accomplishment of USDOT and FHWA mobility goals in the area of infrastructure improvements.	5	17
Number of deliverable research products, innovations, and technologies that support the accomplishment of USDOT and FHWA mobility goals in the area of congestion mitigation.	3	10
Number of deliverable research products, innovations, and technologies that support the accomplishment of USDOT and FHWA environmental goals.	2	1
Number of deliverable research products, innovations, and technologies that support the accomplishment of USDOT and FHWA security goals.	2	1
The annual percentage of research projects reported on schedule. (Note 1)	90%	80%
The level of customer satisfaction for deploying technology and innovation as measured by the FHWA Partners Satisfaction Survey. (Note 2)	See Note 2	69%

Note 1: Delays due largely to delayed funding and personnel changes.

Note 2: There were no targets established for 2006 in the FHWA Partners Satisfaction Survey. The 2006 Partner Satisfaction Survey (PSS) is a followup to the FHWA's State and Local Partners Survey (also known as the WAVE Survey) conducted incrementally during 2003 through 2004. The PSS survey will be conducted every 3 years.

Research Project List

Project	Technical Contact	Projected Goal Impact	Project Completion Status (Percent)				On Schedule	Anticipated Research Completion Date	Product Available	Comments
			25	50	75	100				
Office of Infrastructure R&D										
Pavement Design and Analysis										
Fiber-Reinforced Polymer (FRP) in Concrete Pavement	Katherine Petros HRDI-11 202-493-3154	Mobility and Productivity			X		No	March 2006	Yes	A report containing guidance for design of continuously reinforced concrete using glass fiber reinforced polymer rebars is available.
Impact of Hydraulic Cement Concrete (HCC) Input Parameters on Mechanistic-Empirical (M-E) Pavement Design Guide	Katherine Petros HRDI-11 202-493-3154	Mobility and Productivity	X				Yes	Aug. 2006	No	Contract on hold for 18 months, by FHWA, to acquire final products from four National Cooperative Highway Research Program projects.
Impact of Dynamic Modulus on Prediction Models	Katherine Petros HRDI-11 202-493-3154	Mobility and Productivity			X		Yes	Dec. 2006	No	This is a technical side item of the Accelerated Loading Facility (ALF) Pooled Fund Project.
Integration of LTPP Binder (LTPPBInd) v 3.0 in AASHTO M320	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						Dec. 2007		This project was added following passage of SAFTEA-LU.
Pavement Materials and Construction										
Asphalt Pavement Performance Prediction Symposium	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						Annually in June or July		This project was added following passage of SAFTEA-LU.
Compatibility of Mixture Components	Jack Youtcheff HRDI-11 202-493-3090	Mobility and Productivity				X	Yes	Jan. 2006	Yes	Product is a two-volume research report and accompanying techbrief. Volume 2 contains testing protocol to enable early identification of potential compatibility problems.

Project	Technical Contact	Projected Goal Impact	Project Completion Status (Percent)				On Schedule	Anticipated Research Completion Date	Product Available	Comments
			25	50	75	100				
Concrete Pavement (CP) Road Map	Jack Youtcheff HRDI-11 202-493-3090	Mobility and Productivity				X	Yes	May 2006	No	FHWA staff activity.
Evaluation of Mixless Calibration Techniques for the Superpave Gyrotory Compactor	Jack Youtcheff HRDI-11 202-493-3090	Mobility and Productivity			X		No	Aug. 2006	No	In-house study delayed due to personnel changes.
Future of Full-Scale Accelerated Performance Testing	Jack Youtcheff HRDI-11 202-493-3090	Mobility and Productivity				X	Yes	Aug. 2006	Yes	Established Consortium of Accelerated Performance Testing (CAPT) and developed strategic plan for consortium.
Concrete Mix Optimization Software	Jack Youtcheff HRDI-11 202-493-3090	Mobility and Productivity			X		No	Oct. 2006	No	A beta version of mix optimization software is being field tested.
CP Road Map: Mix Design Track—Phase I Advisory Structure	Jack Youtcheff HRDI-11 202-493-3090	Mobility and Productivity		X			Yes	Dec. 2006	No	Assessed prototype ABCD test equipment and recommended modifications to equipment and procedure.
Guidance on the Use of Acid Modifications for Asphalt Binders	Jack Youtcheff HRDI-11 202-493-3090	Mobility and Productivity			X		No	Dec. 2006	Yes	Experienced a late start due to Office of the Inspector General's (OIG) lime work.
Intelligent Construction System (ICS)—Computer-Based Field Curing Tool for Concrete Pavement	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						Dec. 2006		This project was added following passage of SAFTEA-LU.
Low-Temperature Binder Characterization	Jack Youtcheff HRDI-11 202-493-3090	Mobility and Productivity		X				Dec. 2006		This project was added following passage of SAFTEA-LU.

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Enhancement of HIPERPAV II Software Program	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						April 2007		This project was added following passage of SAFTEA-LU.
Full-Scale Accelerated Performance Testing for Superpave and Structural Validation: Phase II—Loading	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						May 2007		This project was added following passage of SAFTEA-LU.
Procedures for the Detection and Quantification of Lime in Asphalt Pavements	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						May 2007		This project was added following passage of SAFTEA-LU.
Procedures for the Detection and Quantification of Polymer Modifiers in Asphalt Pavements	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						May 2007		This project was added following passage of SAFTEA-LU.
Lithium Technology Research for Mitigation of Alkali-Silica Reactivity (ASR) in Concrete	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						Sept. 2007		This project was added following passage of SAFTEA-LU.
Adequate Air Void System, measured by the Air Void Analyzer (AVA), for Freeze-Thaw Resistance	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						Dec. 2007		This project was added following passage of SAFTEA-LU.
CONcrete Extrusion Workability (CONEW) Device	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						Dec. 2007		This project was added following passage of SAFTEA-LU.
ICS—Smart Rollers	Cheryl Richter HRDI-04	Mobility and Productivity						Dec. 2007		This project was added following passage of SAFTEA-LU.

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			25	50	75	100				
	202-493-3070									
Full-Scale Accelerated Performance Testing for Superpave and Structural Validation: Phase III—Evaluation and Recommendations	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						Aug. 2008	This project was added following passage of SAFTEA-LU.	
Understanding Moisture Damage in Asphalt Pavements—Phase I	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						Dec. 2008	This project was added following passage of SAFTEA-LU.	
Pavement Data and Performance										
Construction Quality Databases	Cheryl Richter HRDI-04 202-493-3070	Mobility and Productivity						Dec. 2008	This project was added following passage of SAFTEA-LU.	
Long-Term Pavement Performance										
Variability of Smoothness Measurements	Aramis Lopez HRDI-13 202-493-3145	Mobility and Productivity				X	Yes	Jan. 2006	Yes	Report No; FHWA-HRT-05-054 http://www.fhwa.dot.gov/pavement/ltp/pubs/05054/
Enhancement of DataPave Online	Aramis Lopez HRDI-13 202-493-3145	Mobility and Productivity				X	Yes	Oct. 2006	Yes	http://www.datapave.com
Frost Determination of Seasonal Monitoring Program (SMP) Sites	Aramis Lopez HRDI-13 202-493-3145	Mobility and Productivity			X		No	Oct. 2006	No	Delayed due to availability of funds.
Moisture Determination of	Aramis Lopez	Mobility and Productivity		X			No	Oct. 2006	No	Delayed due to availability of funds.

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SMP Sites	HRDI-13 202-493-3145									
Smoothness of Pavement at the Approaches to Weigh-in-Motion (WIM) Scales	Aramis Lopez HRDI-13 202-493-3145	Mobility and Productivity				X	Yes	Oct. 2006	Yes	MP05 Material Provisional Standard is available.
Anytime Weather Software	Aramis Lopez HRDI-13 202-493-3145	Mobility and Productivity				X	Yes	Dec. 2006	Yes	Alpha Version is available.
LTPP Program Assessment	Aramis Lopez HRDI-13 202-493-3145	Mobility and Productivity						Dec. 2007		Delayed due to availability of funds.
Bridge Design and Construction										
Enhanced Use of Shallow Foundations for Accelerated Construction	Bill Wright HRDI-6 202-493-3053	Mobility and Productivity					No	Dec. 2006	N/A	Delayed due to availability of funds.
Synthesis Study on Risk and Vulnerability Assessment Methodologies for All Hazards	Sheila Duwadi HRDI-7 202-493-3106	Safety and Security					No	Dec. 2006	N/A	Delayed due to availability of funds.
Junction Loss Experiments: Laboratory Report*	Kornel Kerenyi HRDI-7 202-493-3142	Safety, Mobility, and Productivity				X		Not in 2006-07 Performance Plan	Yes	Report No. FHWA-HRT-07-036 http://www.fhwa.dot.gov/engineering/hydraulics/pubs/07036/index.cfm
Bottomless Culvert Scour Study: Phase II Laboratory Report*	Kornel Kerenyi HRDI-7 202-493-3142	Safety, Mobility, and Productivity				X		Not in 2006-07 Performance Plan	Yes	Report No. FHWA-HRT-07-026 http://www.fhwa.dot.gov/engineering/hydraulics/pubs/07026/

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Trends of Abutment-Scour Prediction Equations Applied to 144 Field Sites in South Carolina*	Kornel Kerenyi HRDI-7 202-493-3142	Safety, Mobility, and Productivity				X		Not in 2006-07 Performance Plan	Yes	This study was in cooperation with the USGS.
Development of a Multiyear Plan for Bridge and Tunnel Security Research, Development, and Deployment*	Sheila Duwadi HRDI-7 202-493-3106	Safety and Security				X		Not in 2006-07 Performance Plan	Yes	Report: "Multiyear Plan for Bridge and Tunnel Security Research, Development, and Deployment" Publication No. FHWA-HRT-06-072, March 2006. http://www.tfrc.gov/structur/pubs/06072/index.htm
Materials Spec-Accelerated Test-Based Specification—Repair Specification	Bill Wright HRDI-6 202-493-3053	Mobility and Productivity					No	Sept. 2007	N/A	Delayed due to availability of funds.
Design Enhancements for Bridge Superstructure and Substructure Interface	Bill Wright HRDI-6 202-493-3053	Mobility and Productivity	X				No	Dec. 2007	No	Research is underway.
Improved Fracture Toughness Specifications for High-Performance Steel (HPS)	Bill Wright HRDI-6 202-493-3053	Mobility and Productivity		X			Yes	Dec. 2008	No	Physical testing is complete. Development of design criteria is in process.
Performance Data for Ultra-High Performance Concrete (UHPC) Bridge Elements	Benjamin Graybeal HRDI-6 202-493-3122	Mobility and Productivity	X				Yes	Dec. 2009	N/A	Delayed due to availability of funds.
Development of Uniform Risk and Vulnerability Assessment Methodologies for All Hazards	Sheila Duwadi HRDI-7 202-493-3106	Safety and Security					No	Dec. 2009	N/A	Delayed due to availability of funds.
Refinement of Load and Load Factors for the Design of	Sheila Duwadi HRDI-7	Safety, Reliability, and Security					No	Dec. 2009	N/A	Delayed due to availability of funds.

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			25	50	75	100				
Highway Bridges for Extreme Events	202-493-3106									
Bridge Safety, Reliability, and Security										
Optimum Bridge Deck Shapes to Minimize Pressure Flow Scour	Kornel Kerenyi HRDI-7 202-493-3142	Safety, Mobility, and Productivity	X				No	Dec. 2007	No	Initiated in FY 2006 as funding became available.
Survey and Review of Wind Load Criteria for Cable-Supported Structures	Harold Bosch HRDI-7 202-493-3031	Safety	X				No	Dec. 2007	No	Initiated in FY 2006 as funding became available through SAFETEA-LU.
Assessment of Current Designs for Structural Vulnerability Against Multiple Hazards	Sheila Duwadi HRDI-7 202-493-3106	Safety and Security					No	Dec. 2008	N/A	Delayed due to availability of funds.
Accelerated Repair and Restoration Techniques for Reconstruction After an Event	Sheila Duwadi HRDI-7 202-493-3106	Safety, Mobility, and Productivity					No	Dec. 2009	N/A	Delayed due to availability of funds.
Development of Guidelines for Bridges Built Near Fault Lines	Hamid Ghasemi HRDI-7 202-493-3042	Safety, Mobility, and Productivity					No	Dec. 2009	N/A	Delayed due to availability of funds.
Sensing and Monitoring Technologies for Extreme Events	Sheila Duwadi HRDI-7 202-493-3106	Safety and Security					No	Dec. 2009	N/A	Delayed due to availability of funds.
Infrastructure Inspection and Management										
Alternative Bridge Deck Reinforcement Materials	Joey Hartmann HRDI-6 202-493-3059	Mobility and Productivity			X		No	December 2009	No	Interim report expected December 2007.

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			25	50	75	100				
Holistic Corrosion Protection Strategies	Joey Hartmann HRDI-6 202-493-3059	Mobility and Productivity					No	June 2007	N/A	Delayed due to availability of funds.
Nondestructive Testing/Evaluation Technologies	Frank Jalinoos HRDI-10 202-493-3082	Mobility and Productivity	X				Yes	June 2007	No	Research underway.
Bridge Coatings Performance and Selection	Joey Hartmann HRDI-6 202-493-3059	Mobility and Productivity				X	Yes	Sept. 2007	No	Public Roads article.
Performance-Based Bridge Management Tools	Joey Hartmann HRDI-6 202-493-3059	Mobility and Productivity					No	Sept. 2007	N/A	Delayed due to availability of funds.
Long-Term Bridge Performance (LTBP) Program	Hamid Ghasemi HRDI-7 202-493-3042	Mobility and Productivity	X				Yes	Dec. 2007	Yes	Program is progressing. Prime contractor selection is expected July 2007. Draft framework and first workshop report are available on Web site.
Compilation and Evaluation of Results from High-Performance Concrete Bridge Projects*	Joey Hartmann HRDI-6 202-493-3059	Mobility and Productivity				X		Not in 2006-07 Performance Plan	Yes	Report No. FHWA-HRT-05-056 and FHWA-HRT-05-057
Optimized Sections for High-Strength Concrete Bridge Girders*	Joey Hartmann HRDI-6 202-493-3059	Mobility and Productivity				X		Not in 2006-07 Performance Plan	Yes	Report No. FHWA-HRT-05-058 http://www.tfrc.gov/structur/pubs/05058/index.htm
Seismic Retrofitting Manual for Highway Structures, Part 1 and 2*	W. Phillip Yen HRDI-7 202-493-3056	Safety, Mobility, and Productivity				X		Not in 2006-07 Performance Plan	Yes	Two manuals were published. FHWA-HRT-06-032 and FHWA-HRT-05-067.

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Seismic Retrofitting Guidelines for Complex Steel Truss Highway Bridges*	W. Phillip Yen HRDI-7 202-493-3056	Safety, Mobility, and Productivity				X		Not in 2006-07 Performance Plan	Yes	These guidelines are a supplement to the 2006 FHWA Seismic Retrofitting Manual for Highway Structures for "unusual" or "long span" steel trusses. The manual is being published
Seismic Isolation of Highway Bridges*	W. Phillip Yen HRDI-7 202-493-3056	Safety, Mobility, and Productivity				X		Not in 2006-07 Performance Plan	Yes	This manual is a supplement to the Guide Specifications for Seismic Isolation Design published by AASHTO in 1999. The manual is being published
Methodology and Software for Seismic Risk Analysis of Highway Systems—REDARS 2*	W. Phillip Yen HRDI-7 202-493-3056	Safety, Mobility, and Productivity				X		Not in 2006-07 Performance Plan	Yes	The REDARS 2 report provides basic framework and demonstrates application of the Seismic Risk Analysis (SRA) methodology and modules. The main modules include hazards, components, system, and economics. The manual is being published
Recommended New Seismic Design Specifications for Highway Bridges*	W. Phillip Yen HRDI-7 202-493-3056	Safety, Mobility, and Productivity				X		Not in 2006-07 Performance Plan	Yes	This study was co-funded with NCHRP to develop new seismic specification for highway bridges. The publication is available through NCHRP 20-7/task 193.
Recommended Seismic Performance Testing Methodology for Bridge Piers*	W. Phillip Yen HRDI-7 202-493-3056	Safety, Mobility, and Productivity				X		Not in 2006-07 Performance Plan	Yes	This is a FHWA staff research project The report is being published
Fire-retardant Treatment for Historic Covered Bridges*	John O'Fallon HRDI-7 202-493-3051	Safety and Environment				X		Not in 2006-07 Performance Plan	No	Final draft report is complete.
Develop Educational Guide on the History of Covered Bridges in the United States*	John O'Fallon HRDI-7 202-493-3051	Environment				X		Not in 2006-07 Performance Plan	No	Final draft report is complete.
Office of Operations R&D										
Intelligent Vehicle Initiative (IVI) and Research Related to Human Centered Systems										
Infrastructure	Gene	Safety			X		No	April 2005	No	These projects were mostly completed by September 2005. However,

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			25	50	75	100				
Consortium (IC) Prototype I Intersection Collision Avoidance (ICA) Projects*	McHale HRDO-04 202-493-3275								the completion date for all of the projects was extended due to the significant Cooperative Intersection Collision Avoidance Systems (CICAS) support required by the IC. The final reports are expected in the near future.	
CICAS IC	Gene Mchale HRDO-04 202-493-3275	Safety	X				Yes	Aug. 2010	No	Partnering with automobile manufacturers, the IC will design, develop, and test prototype CICAS technologies in support of the USDOT's CICAS Initiative. Following testing of prototype systems, the IC will support field operational testing of the CICAS technologies.
Work Zone ITS for Crash Avoidance-Phase II	Peter Huang HRDO-04 202-493-3484	Safety, Mobility and Productivity				X	Yes	April 2006	Yes	In this phase, a prototype system was developed, tested, and demonstrated. The method was studied in a driving simulator and then a public demonstration was held at the Chrysler proving ground in the first quarter of 2006.
Wireless Magnet Work Zone System, SBIR Phase I*	Peter Huang HRDO-04 202-493-3484	Safety, Mobility and Productivity				X	Yes	July 2006	Yes	This project will develop a work zone collision warning system using low-cost magnet sensors and wireless technology. The system will have great potential to significantly reduce rear-end crashes in work zone areas. Phase I of this project focused on the development of magnetic speed sensors.
Wireless Magnet Work Zone System, SBIR Phase II*	Peter Huang HRDO-04 202-493-3484	Safety, Mobility and Productivity	X				Yes	Nov. 2008	No	This project will develop a work zone collision warning system using low-cost magnet sensors and wireless technology. In this phase, a functional integrated system will be developed based on the major components developed in Phase I.
Transportation Management Center (TMC) National Pooled Fund Study Results	Raj Ghaman HRDO-03 202-493-3270 Thomas Granda HRDS-07 202-493-3365	Safety, Mobility and Productivity					Yes	Ongoing	Yes	This is a study of the operational and human centered issues common among agencies that manage and operate TMCs. States contribute to this pooled-fund project on a yearly basis and select projects on an ongoing basis depending on the availability of funds.
Human Factors Assessment of Infrastructure-Based ICA Devices—Phase II	Gene Mchale HRDO-04 202-493-3275	Safety						Sept. 2006		This work is reported in Project 16 under Safety R&D.
Traffic Control	Joe Moyer	Safety,					Yes	Ongoing	Yes	A consortium of State, regional, and local entities, FHWA, and other

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Device Consortium Pooled Fund Study	HRDS-07 202-493-3370	Mobility and Productivity							partners are evaluating innovative traffic control devices. The results will be included in the <i>Manual on Uniform Traffic Control Devices</i> (MUTCD). This study will be done in conjunction with the Human Centered Systems Laboratories.	
Real-Time Linux Operating System for Advanced Traffic Controllers	David Gibson HRDO-04 202-493-3271	Mobility and Productivity				X	Yes	Sept. 2006	No	The purpose of this project is to connect the Linux real-time operating system to advanced transportation controllers. This will provide the support necessary for faster detector polling and information processing, which is required for CICAS and vehicle infrastructure integration (VII) research. Phase I and II are complete. A draft final report for Phase II is under review. Phase III will develop a version of the software suitable for on street use by traffic signal vendors.
Traffic Control and Operations										
Adaptive Control System (ACS) "Lite"-Field Tests	Raj Ghaman HRDO-03 202-493-3270	Mobility and Productivity				X	No	Jan. 2006	No	Econolite controller testing was completed in Gahanna, OH. Eagle controller testing was completed in Houston, TX and Peek controller testing was completed in Bradenton, FL. The final field test of McCain controllers is planned for El Cajon, CA. Developing the interface between the proprietary controllers and the ACS Lite software took longer than originally anticipated. The estimated completion date is January 2007.
Identify Service Concepts and Technologies for Emergency Transportation Operations	Raj Ghaman HRDO-03 202-493-3270	Safety, Security, Mobility and Productivity				X	No	Jan. 2006	Yes	Service Concept Task 3 report delivered in September 2005, and Technology Final Report in September 2006.
Surface Transportation Security and Reliability Information System Model Deployment (iFlorida)	Toni Wilbur HRDO-01 202-493-3269	Safety, Security, Mobility and Productivity		X			No	June 2008	No	This project will demonstrate and evaluate how security, reliability, and safety can be enhanced through the widespread availability of real-time information. The deployment phase is nearing completion and the project evaluation is underway.
Coordinated Freeway and Arterials Plans and Procedures Handbook*	James Colyar HRDO-03 202-493-3282	Mobility and Productivity				X	No	May 2006	Yes	Report No. FHWA-HRT-06-095 http://www.tfsrc.gov/its/pubs/06095/index.htm
<i>Ramp Management Handbook*</i>	James Colyar HRDO-03 202-493-3282	Mobility and Productivity				X	No	Jan. 2006	Yes	This is a follow-up document to the <i>Freeway Management and Operations Handbook</i> (FHWA-OP-04-003). The final handbook, primer, brochure, fact sheet, and FAQs are finished and available at: http://www.ops.fhwa.dot.gov/freewaymgmt/ramp_mgmnt.htm

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Integrated Corridor Management (ICM) Initiative-Phase I: Foundational Research	Dale Thompson HRDO-03 202-493-3420	Safety, Mobility and Productivity				X	Yes	Completed	Yes	The foundational research to initiate the ICM program is complete.
Integrated Corridor Management (ICM) Initiative-Phase II: Technical Integration and Advanced Modeling Systems	Dale Thompson HRDO-03 202-493-3420	Safety, Mobility and Productivity	X				Yes	Sept. 2008	No	ICM stakeholder involvement will continue through Phase II (ICM Research and Systems Development). During Phase II, researchers will address integration issues, initiate research projects, develop ICM analysis tools, and establish demonstration sites. More information is available at: http://www.itsa.org/icm.html .
Integrated Corridor Management (ICM) Initiative-Phase III: Pioneer Site Demonstrations*	Dale Thompson HRDO-03 202-493-3420	Safety, Mobility and Productivity	X				Yes	Dec. 2007	No	Phase III is underway with eight pioneer sights selected to develop ICM concepts of operations. Multiple Pioneer Sites were chosen to expand the probability of generating innovative ideas, and to demonstrate the broadest advancement of the new concept of ICM.
Integration of DynaMIT, CLAIRE, and the Advanced Incident Detection Algorithm (AIDA) for Real-Time Traffic Management on Arterials: Field Test in Los Angeles, CA.	Henry Lieu HRDO-03 202-493-3273	Mobility and Productivity				X	No	April 2006	No	The goal of this project is to integrate DynaMIT, CLAIRE, and AIDA to facilitate real-time traffic management on arterials in Los Angeles, CA. The project is complete.
Integration of DYNASMART-X, CLAIRE, and RHODES® for Real-Time Traffic Management: Field Test in Houston, TX	Henry Lieu HRDO-03 202-493-3273	Mobility and Productivity			X		No	Dec. 2007	No	The goal of this project is to integrate DYNASMART-X, CLAIRE, and RHODES into TranStar SM in Houston, TX. This will allow for real-time traffic management to alleviate traffic congestion, particularly congestion caused by freeway reconstruction and flooding. The project was delayed by 1 year due to contracting issues that have now been resolved. The project started in early 2005 and is projected to be completed in December 2007.
Winter Weather Maintenance Decision Support System (MDSS) Deployment Assistance	Randall VanGorder HRDO-03 202-493-3266 Rudy Persaud HRDO-04 202-493-	Safety, Mobility and Productivity, Environment			X		Yes	Sept. 2006	Yes	This project will provide deployment assistance to ensure that the MDSS technology is transferred successfully to the private sector. The project also will complete all programming, documentation, and evaluations from the second year of the MDSS demonstration. Paul Pisano is the COTR for this project. The project was extended for an additional year. The new estimated completion date is Sep 2007.

Project	Technical Contact	Projected Goal Impact	Project Completion Status (Percent)				On Schedule	Anticipated Research Completion Date	Product Available	Comments
			25	50	75	100				
	3391									
Winter Weather MDSS Pooled Fund Study	Rudy Persaud HRDO-04 202-493-3391	Safety, Mobility and Productivity, Environment			X		Yes	June 2006	No	This project is a pooled fund study involving nine States. The project goal is to develop an MDSS to help maintenance crews better plan and respond to winter weather and road conditions. This project was extended for an additional year of field testing and evaluation. As with all pooled fund studies, this project may be extended based on the continued mutual interest of the pooled fund member agencies. The new estimated completion date is June 2007.
Clear Roads Pooled Fund Study	Rudy Persaud HRDO-04 202-493-3391	Safety, Mobility and Productivity, Environment		X			Yes	Dec. 2007	No	Clear Roads is a pooled fund research project aimed at rigorous testing of winter maintenance materials, equipment, and methods for use by highway maintenance crews.
High Plains ITS Coalition*	Rudy Persaud HRDO-04 202-493-3391	Safety, Mobility and Productivity, Environment		X			Yes	Dec. 2007	No	The purpose of the coalition is to gather and share information that will help agency personnel in each State make operational decisions based conditions and actions taking place in the surrounding state. Under this project, a web-based system will be built that disseminates information about those conditions and actions on the highway system.
Empirical Studies of Traffic Flow in Inclement Weather*	James Colyar HRDO-03 202-493-3282	Safety, Mobility and Productivity			X		Yes	Dec. 2006	No	This project involves collecting traffic and weather data from Baltimore, MD; Minneapolis, MN; and Seattle, WA. After the data are collected, the relationship between adverse weather and traffic operations will be researched. The final report is under final editing.
<i>Traffic Detector Handbook</i>	David Gibson HRDO-04 202-493-3271	Safety, Mobility and Productivity				X	No	Completed	No	The update to the handbook is complete, a peer review was completed, and a request for printing was submitted.
Traffic Detector Video	David Gibson HRDO-04 202-493-3271	Safety, Mobility and Productivity				X	No	Sept. 2006	No	The video clearly explains how to install inductive loop detectors. It will be distributed to the appropriate mailing lists on DVD.
Unmanned Aerial Vehicle (UAV) for Aerial Surveillance	David Gibson HRDO-04 202-493-3271	Safety, Mobility and Productivity					No	N/A	No	This project was terminated due to contactor fiscal problems.
Pedestrian Stereo Imaging Sensor	David Gibson	Safety, Mobility and			X		Yes	Sept. 2007	No	This project will investigate the uses of stereo imaging to detect and trace pedestrians near intersections. Phase 1 was completed in

Project	Technical Contact	Projected Goal Impact	Project Completion Status (Percent)				On Schedule	Anticipated Research Completion Date	Product Available	Comments
			25	50	75	100				
	HRDO-04 202-493-3271	Productivity							September 2005. A second phase has been recommended, with an estimated completion date of September 2007.	
Traffic Analysis Tools/Simulation and Modeling										
Strategic Work Zone Analysis Tools (SWAT)	Debbie Curtis HRDO-03 202-493-3267	Mobility and Productivity				X	Yes	Dec. 2005	Yes	All projects under this program were completed in December 2005.
CORSIM Application Guidelines	James Colyar HRDO-03 202-493-3282	Mobility and Productivity			X		No	Jan. 2006	No	These guidelines will be Volume IV of the FHWA Traffic Analysis Toolbox. The start of the project was delayed, but the final report is now under final editing. The new target completion date is September 2007.
Next Generation Simulation Modeling (NGSIM)	James Colyar HRDO-03 202-493-3282	Mobility and Productivity			X		No	Dec. 2007	Yes	The following tasks or products are complete and available at http://ngsim.fhwa.dot.gov/ : <ul style="list-style-type: none"> ▪ Algorithm assessment and algorithm prioritization reports. ▪ High-level project development plans. Prototype and full vehicle trajectory dataset on I-80 in Emeryville, CA. ▪ Vehicle trajectory datasets for U.S. 101 freeway and Lankershim Blvd. Arterial in Los Angeles, CA ▪ Open-source version of MITSIMLab, a simulation package used for algorithm validation. ▪ Freeway lane selection algorithm. and commercial validation of algorithm by simulation developers ▪ Cooperative freeway merge algorithm ▪ Arterial lane selection algorithm (March 2007). ▪ Oversaturated freeway flow algorithm (March 2007). ▪ Arterial vehicle trajectory dataset in Atlanta, GA
DynaMIT-P-Field Test in Hampton Roads, VA*	Henry Lieu HRDO-03 202-493-3273	Mobility and Productivity				X	No	April 2006	No	The Phase 1 offline evaluation work was completed in July 2004. The Phase 2 online evaluation work started in September 2004. The work is complete and the software was delivered to the Center for Microcomputers in Transportation (McTrans) for distribution.
Enabling Technologies										
Global Positioning System (GPS) Surface Observation System Installation for	James Arnold HRDO-04 202-493-3265	Safety, Mobility and Productivity, Environment, Security			X		No	Dec. 2007	No	The installation of GPS Surface Observation System (GSOS) meteorological sensors at NDGPS sites provides useful weather observations and the information needed to calculate atmospheric water vapor. Funding was not available to meet the December 2005 target date. The new estimated completion date is December 2007.

Project	Technical Contact	Projected Goal Impact	Project Completion Status (Percent)				On Schedule	Anticipated Research Completion Date	Product Available	Comments
			25	50	75	100				
Integrated Precipitable Water Vapor (IPWV)*	Rudy Persaud HRDO-04 202-493-3391									
NDGPS Reference Station Modernization*	James Arnold HRDO-04 202-493-3265	Safety, Mobility and Productivity, Environment, Security		X			No	Dec. 2008	No	This project involves research to define existing GPS capability. The December 2008 target completion date is based on anticipated funding.
NEPA Environmental Investigations in support of NDGPS*	Rudy Persaud HRDO-04 202-493-3391 James Arnold HRDO-04 202-493-3265	Safety, Mobility and Productivity, Environment, Security			X		No	Dec. 2008	No	The NDGPS program serves transportation, public safety, and scientific applications. As part of this effort, FHWA is presently gathering information to prepare documentation to support a finding of no-significant impact (FONSI) as outline in the NDGPS (PEA) which was prepared for the entire NDGPS program.
High-Accuracy NDGPS	James Arnold HRDO-04 202-493-3265	Safety, Mobility and Productivity, Environment, Security			X		Yes	Dec. 2007	No	This is a research program to evaluate the potential for achieving very high-accuracy navigation solutions using existing infrastructure.
Precipitable Water Vapor for Weather Forecasting*	James Arnold HRDO-04 202-493-3265	Safety, Mobility and Productivity, Environment, Security			X		Yes	Dec. 2007	No	This is a research program to develop and evaluate a precipitable water vapor algorithm, which will help improve weather forecasting.
Dedicated Short-Range Communications/ Wireless Access for Vehicular Environments	James Arnold HRDO-04 202-493-3265	Safety, Mobility and Productivity, Environment, Security			X		Yes	Dec. 2008	No	This project involves the development of telecommunications technology. Researchers will obtain a spectrum allocation from the Federal Communications Commission; develop licensing rules, standards, and prototypes; and perform an initial deployment of the technology.
Telecommunications Interference Model for Predicting Ionospheric Changes	James Arnold HRDO-04 202-493-	Safety, Mobility and Productivity, Environment,			X		Yes	Dec. 2008	No	This is a research program to develop and evaluate an ionospheric model for predicting interference levels with telecommunication systems.

Project	Technical Contact	Projected Goal Impact	Project Completion Status (Percent)				On Schedule	Anticipated Research Completion Date	Product Available	Comments
			25	50	75	100				
	3265	Security								
Identify Mobility Applications for Vehicle Infrastructure Integration (VII)	Bob Ferlis HRDO-02 202-493-3268	Mobility and Productivity				X	Yes	Jan. 2006	Yes	This project was intended to identify and assess innovative mobility concepts as an ITS Tier 2 exploratory initiative. The reports are available for internal USDOT use, and serve as the basis for ITS and FHWA Operations management briefings.
Office of Safety R&D										
Run-Off-The-Road Prevention: Design										
Driver Performance Effects from Innovative Applications of Pavement Markings and Raised Retroreflective Pavement Markers (RRPM) (Field Study)	Ken Opiela HRDS-5 202-493-3371	Safety				X	Yes	June 2006	No	Final report submitted and accepted, but not yet published.
Interactive Highway Safety Design Model (IHSDM)—Two-Lane Rural Highway Update Release	Ray Krammes HRDS-5 202-493-3312	Safety				X	Yes	Sept. 2006	Yes	The 2006 updated public release of IHSDM was posted on September 30, 2006.
Driver Performance Effects from Innovative Applications of Pavement Markings and RRPMS (Lab Study)	Ken Opiela HRDS-5 202-493-3371	Safety				X	Yes	Dec. 2006	No	Final report, combined with related field study was submitted and accepted, but is not published yet.
Wet Night Visibility of Pavement Markings	Carl Andersen HRDS-5 202-493-3366	Safety				X	Yes	March 2007	No	On schedule for FY 2007 completion.
Updated Minimum Levels for Pavement marking Retroreflectivity	Carl Andersen HRDS-5 202-493-3366	Safety		X			Yes	Sept. 2007	No	On schedule for FY 2007 completion.

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Guidelines for Maintaining Night Visibility of Pavement Markings	Ken Opiela HRDS-5 202-493-3371	Safety			X		Yes	Sept. 2007	No	On schedule for FY 2007 completion.
Run-Off-The-Road Mitigation: Severity Reduction										
Mailbox Surrogate Test	Ken Opiela HRDS-5 202-493-3371	Safety			X		No	June 2006	No	Completion of remaining work was deferred to FY 2008 due to other competing priorities.
Guardrail Blockout Surrogate Test	Ken Opiela HRDS-5 202-493-3371	Safety		X			No	Sept. 2006	No	Efforts are continuing under an expanded scope, with anticipated completion date of June 2008.
Cable Median Barrier Development	Ken Opiela HRDS-5 202-493-3371	Safety			X		No	Sept. 2006	No	First phase is complete and Phase 2 efforts were completed.
Vehicle Impacts for Median Landscape Treatments	Ken Opiela HRDS-5 202-493-3371	Safety	X				No	Dec. 2006	No	Initiation of this project was deferred due to competing priorities, but this effort was reprogrammed to be part of an FY 2007 effort on "Effects of Terrain on Vehicle Trajectories."
Intersections										
Design and Performance Analysis of Pedestrian Crossing Facilities for Continuous Flow Intersections	Joe Bared HRDS-5 202-493-3314	Safety				X	Yes	Jan. 2006	Yes	Study results published in Transportation Research Record 1939.
Operational Evaluation of the New Jersey Jughandle Intersection	Joe Bared HRDS-5 202-493-3314	Safety			X		Yes	June 2007	No	On schedule for FY 2007 completion.
Safety Evaluation of	Joe Bared	Safety				X	Yes	Jan. 2007	Yes	Study results published in Transportation Research Record 1953.

Project	Technical Contact	Projected Goal Impact	Project Completion Status (Percent)				On Schedule	Anticipated Research Completion Date	Product Available	Comments
			25	50	75	100				
the New Jersey Jughandle Intersection	HRDS-5 202-493-3314									
Safety Impact of Urban Freeway Interchange Spacing	Joe Bared HRDS-5 202-493-3314	Safety			X		Yes	June 2007	No	On schedule for FY 2007 completion.
Novel Intersections—Diverging Diamond Interchanges	Joe Bared HRDS-5 202-493-3314	Safety			X		Yes	May 2007	No	On schedule for FY 2007 completion.
Safety Analysis of Interchanges	Joe Bared HRDS-5 202-493-3314	Safety			X		Yes	Aug. 2007	No	On schedule for FY 2007 completion.
Pedestrians and Bicyclists										
Tier 2: ITS Technologies to Reduce Pedestrian Injuries and Fatalities	Ann Do HRDS-6 202-493-3319	Safety				X	Yes	May 2006	Yes	Final report completed. It will not be published but is available upon request.
Evaluation of Safety Design and Operation of Shared-Use Paths	Ann Do HRDS-6 202-493-3319	Safety				X	Yes	April 2006	Yes	Report No. FHWA-HRT-05-137 (Final Report) http://www.tfhrc.gov/safety/pedbike/pubs/05137/index.htm , and Report No. FHWA-HRT-05-138 (User Guide) http://www.tfhrc.gov/safety/pedbike/pubs/05138/index.htm
University Course on Pedestrians and Bicyclists	Ann Do HRDS-6 202-493-3319	Safety				X	Yes	April 2006	Yes	Published as FHWA-HRT-06-065.
Development of Design Guidelines for Crosswalk Lighting	Carl Andersen HRDS-5 202-493-3366	Safety			X		No	May 2006	No	Data collection and analysis completed. Project delayed with new completion date of July 2007.
Pedestrian Bicycle Crash Analysis Tool (PBCAT) V 2.0	Ann Do HRDS-6 202-493-3319	Safety				X	Yes	May 2006	Yes	Published as FHWA-HRT-06-089 (Software) and FHWA-HRT-06-090 (Tech Brief).
In-Roadway	Ann Do	Safety		X			No	June 2006	No	Completion delayed and on hold pending resolution of equipment

Project	Technical Contact	Projected Goal Impact	Project Completion Status (Percent)				On Schedule	Anticipated Research Completion Date	Product Available	Comments
			25	50	75	100				
Warning Lights Study	HRDS-6 202-493-3319								malfunction at one of two evaluation sites.	
Segway® Human Transporter	Ann Do HRDS-6 202-493-3319	Safety			X	Yes	June 2006	No	Originally planned effort completed. Final report submitted but pending publication. A new phase of work has been added and is underway.	
Hazard Index for Assessing Pedestrian and Bicyclist Safety at Intersections	Ann Do HRDS-6 202-493-3319	Safety			X	No	Sept. 2006	No	Retitled "Pedestrian and Bicyclist Safety Indices at Intersections." Final report from contractor expected by Dec 2006 with publication by June 2007.	
Speed Management										
Results of Field Tests on Impacts of Settings and Enforcing Rational Speed Limits	Abdul Zineddin HRDS-5 202-493-3369	Safety			X	Yes	Dec. 2006	No	The evaluation in one community that HRDS staff managed is on schedule for FY 2007 completion.	
Safety Management Systems										
Rollover Causation Study	Carol Tan HRDS-5 202-493-3315	Safety	X			No	Sept. 2006	No	In-house study canceled due to staffing shortages.	
SafetyAnalyst	Ray Krammes HRDS-5 202-493-3312	Safety			X	Yes	Nov. 2006	No	On schedule for FY 2007 delivery of the interim version of the software to participating pooled-fund States for testing.	
Evaluation of the Safety Edge	Carol Tan HRDS-5 202-493-3315	Safety		X		Yes	June 2007	No	On schedule for FY 2007 delivery of an interim report on evaluation of crash data for the first year after installation of the Safety Edge. The final report, based upon 3 years of after-period data, is scheduled for delivery June 2009.	
Advanced Research—Digital Highway Measurement Vehicle	Kunik Lee HRDS-4 202-493-3491	Safety	X			No	Dec. 2007	No	Initiation of project was delayed and is pending sufficient response to pooled-fund study solicitation.	
Evaluation of Low-Cost Safety	Carol Tan HRDS-5	Safety			X	Yes	June 2007	No	On schedule for FY 2007 completion of evaluations of four low cost safety treatments.	

Project	Technical Contact	Projected Goal Impact	Project Completion Status (Percent)				On Schedule	Anticipated Research Completion Date	Product Available	Comments
			25	50	75	100				
Improvements	202-493-3315									
Human Centered Systems										
Sign Assessment for Infrastructure Systems	Tom Granda HRDS-7 202-493-3365	Safety, Mobility and Productivity				N/A	Yes	Ongoing	Yes	Continuing effort to aid Office of Operations with MUTCD-related issues. Multiple products are available, primarily through a Traffic Control Devices Pooled Fund Study.
Infrastructure-Cooperative Systems ICA Phase 2 (Mid-Phase Traffic Signal Adaptation Study)	Tom Granda HRDS-7 202-493-3365	Safety, Mobility and Productivity	X				No	Dec. 2007	No	Project postponed indefinitely due to lack of funding.
Traffic Control Device Consortium Pooled Fund Study Projects	Tom Granda HRDS-7 202-493-3365	Safety, Mobility and Productivity				N/A	Yes	Ongoing	Yes	Continuing effort to investigate issues of concern to Pooled Fund Study member States. See http://www.pooledfund.org/projectdetails.asp?id=281&status=4 for details.
Transportation Management Center (TMC) Pooled Fund Study Projects	Tom Granda HRDS-7 202-493-3365	Mobility and Productivity				N/A	Yes	Ongoing	Yes	Continuing effort to investigate issues of concern to Pooled Fund Study member States. See http://tmcdfs.ops.fhwa.dot.gov/index.cfm for details.

* Additions to FY 2006/2007 Performance Plan