

Research, Development, and Technology

FY 2000/2001 UNIT PLAN

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Visit the Unit Plan Website.



U.S. Department
of Transportation
**Federal Highway
Administration**

Becoming Essential, Indispensable, and Connected

The Federal Highway Administration's (FHWA's) Office of Research, Development, and Technology (RD&T) is located at the Turner-Fairbank Highway Research Center (TFHRC), a Federally-owned and operated research facility in McLean, VA. RD&T provides leadership in the development and coordination of a national highway research and technology program, support for technology knowledge dissemination, and service through technology knowledge development.

RD&T (108 federal employees and 200 on-site contractors) is organized into six offices: (1) the Office of Resource Management (HRRM) provides the administrative services for RD&T customers; (2) the Office of Program Development and

Evaluation (HRPD) develops and executes policy, budget, program management, and administrative mechanisms to enable a nationwide FHWA research, development, and technology program to be carried out in cooperation with our partners; (3) the Office of Safety R&D (HRDS) conducts R&D and testing to continually improve highway safety;

(4) the Office of Operations R&D (HRDO) conducts R&D and testing to continually improve highway operations; (5) the Office of Infrastructure R&D (HRDI) conducts R&D and testing to continually improve highway infrastructure; and (6) the Office of Research and Technology Services develops and executes a comprehensive RD&T communications strategy and marketing plan in support of FHWA-wide RD&T programs and the technology delivery needs of the Core Business Units (CBU's) and Resource Centers (RC's). RD&T manages a Federal Research and Technology budget in excess of \$100 million.

RD&T's Leadership Council guides the entire Center to ensure our research is essential, indispensable, and connected to the customer. RD&T's researchers,

organized by teams that encompass more than 100 transportation-related disciplines, are dedicated to finding innovative solutions to the problems facing the highway community today. The end result is a safer, more efficient, reliable, and lasting highway transportation system.

FHWA Strategic plan provides the "blueprint" for the agency to establish priorities and direction for its contributions to the Nation's highways and intermodal transportation system.

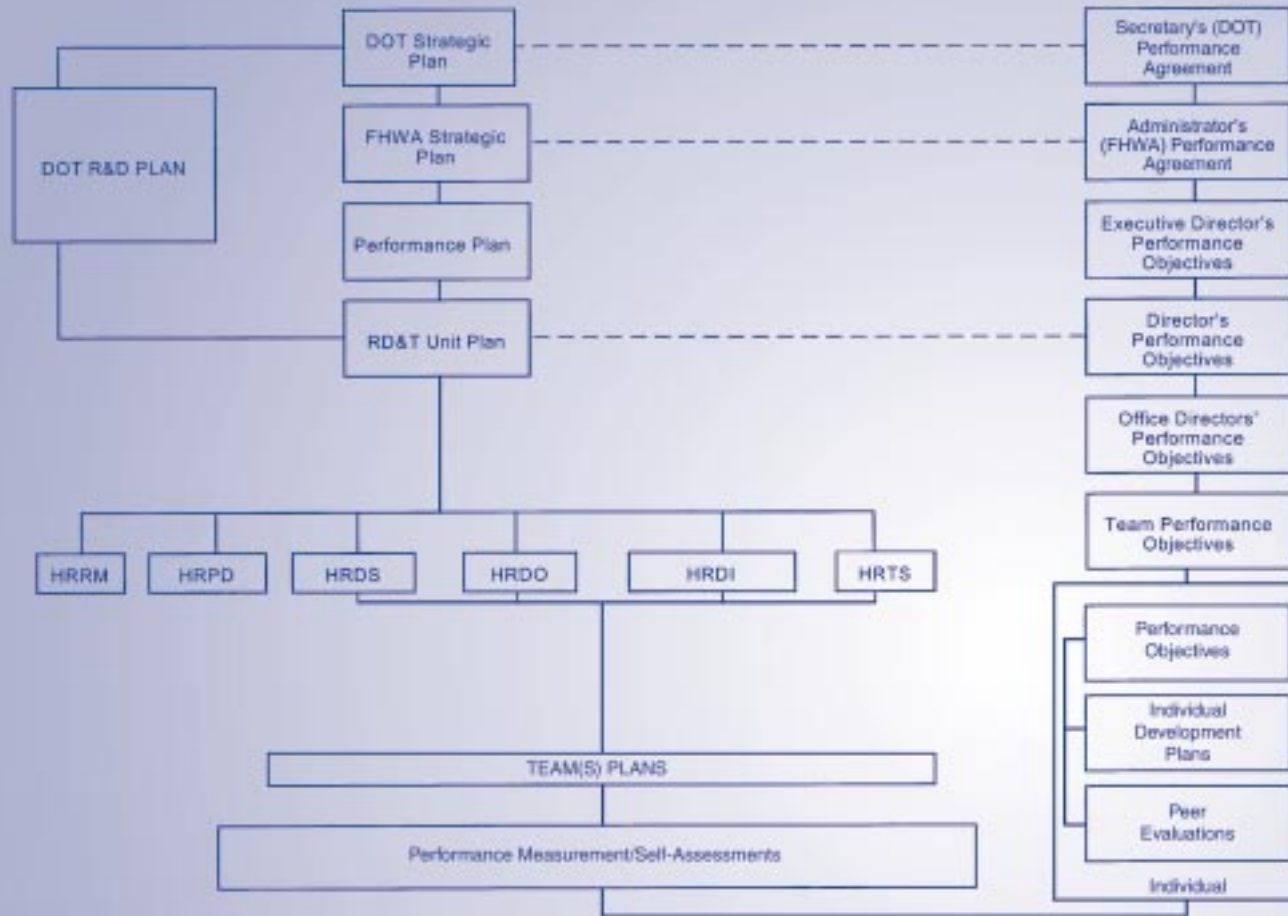
The FHWA Research and Technology (R&T) Program directly supports the goals of the United States Department of Transportation (DOT) and FHWA to invest strategically in transportation infrastructure, promoting safe and secure transportation, enhancing our environment, and creating new alliances between the Nation's transportation and technology industries. DOT's approach to research emphasizes cooperation, information-sharing, and the development of formal research agendas among the agencies within DOT and across the entire Government. It promotes partnerships with State and local governments, academia, and the private sector to cost-effectively accelerate the transformation of new technologies, concepts, and ideas into better transportation systems, processes, and services. The DOT Research and Development (R&D) Plan identifies key enabling elements that will transform our transportation services and help bring those improvements to pass.

RD&T strives to conduct research that is essential, indispensable, and connected to our customers.

Through the development of safer and more economical, environmentally sensitive designs; more efficient movement of vehicles and people; higher quality-controlled construction practices; and more durable materials, RD&T exemplifies FHWA's ongoing commitment to serve the highway community and the public.

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RD&T's Planning Performance Alignment Framework



Framework

Vision and Mission

For the Department of Transportation (DOT), Federal Highway Administration (FHWA), and Research, Development, and Technology (RD&T)

VISION OF
DOT

A visionary and vigilant Department of Transportation leading the way to transportation excellence in the 21st Century.

 www.dot.gov

VISION OF
FHWA

Create the best transportation system in the world.

 www.fhwa.dot.gov

VISION OF
RD&T

The RD&T organization is essential, indispensable, and connected to our partners in advancing research and technology.

 www.tfhrc.gov

MISSION OF
DOT

Serve the United States by ensuring a fast, safe, efficient, accessible, and convenient transportation system that meets our vital national interests and enhances the quality of life of the American people, today and into the future.

 www.dot.gov

MISSION OF
FHWA

We continually improve the quality of our Nation's highway system and its intermodal connections.

 www.fhwa.dot.gov

MISSION OF
RD&T

Leads in the development of a nationally coordinated research and technology program; champions the advancement of highway technological innovation in support of FHWA strategic goals and performance objectives; advances knowledge through research, development, testing, and evaluation services; and provides support and assistance throughout FHWA in matters relating to research, development, and technology.

 www.tfhrc.gov

Goals of the DOT

Safety: Promote the public health and safety by working toward the elimination of transportation-related deaths, injuries, and property damage.

Mobility: Shape America's future by ensuring a transportation system that is accessible, integrated, and efficient and offers flexibility of choices.

Economic Growth and Trade: Advance America's economic growth and competitiveness domestically and internationally through efficient and flexible transportation.

Human and Natural Environment: Protect and enhance communities and the natural environment affected by transportation.

National Security: Advance the Nation's vital security interests in support of national strategies such as the National Security Strategy and National Drug Control Strategy by ensuring that the transportation system is secure and available for defense mobility and that our borders are safe from illegal intrusion.

Goals of the FHWA

Safety: Continually improve highway safety.

Mobility: Continually improve the public's access to activities, goods, and services through preservation, improvement, and expansion of the highway transportation system and enhancement of its operations, efficiency, and intermodal connections.

Productivity: Continuously improve the economic efficiency of the Nation's transportation system to enhance America's position in the global economy.

Human and Natural Environment: Protect and enhance the natural environment and communities affected by highway transportation.

National Security: Improve the Nation's national defense mobility.

RD&T Corporate Management Strategies and Goals

Leadership: Guides RD&T in setting directions and seeking future opportunities.

Strategic Planning: Demonstrates customer-driven quality and contribution to the FHWA strategic goals.

Safety: Continually improve highway safety and contribute to the FHWA performance goal to achieve a 20-percent reduction in highway-related fatalities, injuries, and crashes and a 50-percent reduction in truck fatalities and crashes in a 10-year period.

Mobility: Continually improve the public's access to activities, goods, and service through preserving and enhancing the infrastructure of Federal-aid highways; improving the operation of the National Highway System; and protecting our bridges and structures.

Productivity: Continuously improving the return on investment of the National Highway System; and enabling the bridge system to improve and increase its output.

Human and Natural Environment: Continuously enhancing and protecting communities and the environment.

Human Resource Development and Management: Recruits, recognizes achievement, and trains the best skills/talent for conducting outstanding research.

Customer and Partner Focus: Understands the voices of the customers and partners.


Information and Analysis: Manages key information to effectively manage the RD&T program.

Process Management: Continuously improves key work processes.

Business Results (Metrics): Researches, measures, transfers, and evaluates the right things, the right way!

Research, Development, and Technology

Action Agenda to Produce Results

In order to produce results, the RD&T Leadership Council created an Action Agenda with specific tasks, schedules, and assigned responsibilities. The Action Agenda is a dynamic document which will be updated as items are initiated, advanced, and accomplished. For the current Action Agenda and/or more details on any item, click on  to go to the RD&T home page.

For faster access to details about these items, go to the [Unit Plan Website](#).

Action Item	Office	Target Comp Date
A. Leadership		
1. "Leveraging Technology & Innovation" White Paper (MC)	HRT	2/00
2. R&T Decision-Making Working Group (MC) (TP)	HRT	4/00
3. RD&T Self Assessments, Employee Innovation, and Recognition and Awards (TP)	HRT/HRRM	9/99
B. Strategic Planning		
1. Mobility (PP)	See FY 2000/2001 Products Page	FY 2000/2001
2. Safety (PP)	See FY 2000/2001 Products Page	FY 2000/2001
3. Productivity (PP)	See FY 2000/2001 Products Page	FY 2000/2001
4. Human and Natural Environment (PP)	See FY 2000/2001 Products Page	FY 2000/2001
C. Human Resource Development & Management		
1. Team Operations and Performance	HRRM	9/00

D. Customer & Partner Focus		
1. National R&T Partnership <i>(TP)</i>	HRT	on-going
2. RD&T Directory	HRTS/HRRM	1/00
3. Communicating the FHWA R&T Story <i>(TP)</i>	HRPD	9/00
4. Support LC for interaction w/other FHWA offices, customers, and partners	HRTS	3/00
5. Technology Facilitation/Strategy and Action Plan <i>(TP)</i>	HRDI/HRDS/HRDO	2/00
6. Communicating RD&T Activities	HRTS	5/00
E. Information and Analysis		
1. Status monitoring of R&T projects & products (ABS, etc.)	HRRM	9/00
2. R&T / RD&T Web Site	HRTS	2/00
F. Process Management		
1. Re-engineer Pooled Fund Program <i>(IW)</i>	HRPD	6/00
2. Travel / Scientific Equipment Budget	HRRM	10/00
3. Procurement Process (Incl. MIHE / HBCU guidance) (FHWA Staff / Contractor Relationships & Issues) <i>(TP)</i>	HRRM	3/00
4. Technology / Innovation Process Improvement	ALL	
5. FHWA Participation in NCHRP Process	HRDS	5/00
G. Business Results (Metrics)		
1. Performance Evaluation of R&T Programs <i>(TP)</i>	HRPD	9/00
2. Laboratory Inventory and Assessment <i>(TP)</i>	HRTS	2/00

Note: (MC) Management Council, (PP) Performance Plan, (TP) Top Priorities, (IW) Innovation Workshop: Indicates origin of item. Items not noted were initiated by the Leadership Council.

Research, Development, and Technology

Our products resulting from the Action Agenda

For faster access to details about these items, go to the [Unit Plan Website](#).

For more details on any product,

 click on the product.

SAFETY

Run Off Road Prevention & Mitigation

- ▶ Interactive Highway Design Safety Design Model (IHSDM): beta tests on
 - Policy Review Module
 - Design Consistency Module
 - Crash Prediction Module (Roadway Team)
 - ▶ Sign and Pavement Markings Retroreflectivity Research Findings (Roadway Team)
 - ▶ All-Weather Pavement Markings Study and Findings (Roadway Team)
 - ▶ Ultraviolet Lighting and Fluorescence Materials Pilot Test Results at VA Tech's "Smart Road" (Roadway Team)
 - ▶ Crash Test Simulation Models at National Crash Analysis Center for:
 - Transitions
 - Wood Materials for Guardrails
 - 18,000-lb Single-Unit Trucks (Roadside Team)
 - ▶ Vehicle Crash Testing and Results for Transitions, Cable Guardrails, and Buried-in-back Slope Terminals (Roadside Team)
 - ▶ R&D Program Plan to address rollover crashes (Roadside Team)
- ### *Pedestrian and Bicycle Safety*
- ▶ Pedestrian/Bicycle Crash Analysis Tool (PBCAT) Software (Roadway Team)
 - ▶ Pedestrian Facilities Safety User Guide (Roadway Team)

- ▶ ITS Pedestrian Safety Applications Information Guide (Roadway Team)

- ▶ Pedestrian/Bicycle Transportation Safety University Course (Roadway Team)

Safety Management Systems

- ▶ Highway Safety Information System (HSIS) Summary Reports on:
 - Proximity
 - Red Light Running
 - High Priority Roadside Safety (Safety Management Team)

- ▶ Geographic Information System (GIS) Safety Analysis Tool: Version 2.0 (Safety Management Team)

- ▶ Initiate Comprehensive Highway Safety Improvement Model project (Safety Management Team)

- ▶ Work Zone Accident Exposure Analysis Technical Brief (Safety Management Team)

- ▶ Safety Data Analytical Support to the Safety Core Business Unit & Field (Safety Management Team)

Speed Management

- ▶ Variable Speed Limit Technical Assessment Plan and Proposed Pilot Studies: developed and coordinated with NCHRP 3-59 (Roadway Team)

- ▶ Roundabouts Information Guide (Roadway Team)

Human Factors Safety

- ▶ Truck Rest Stop Study & Report to

- Congress (Roadway Team and Human Center System Team)

- ▶ Revise Older Driver Handbook and course (Human Center System Team)

Intelligent Vehicle Initiative (IVI)

- ▶ Evaluation of Intelligent Vehicle Initiative (IVI) Generation 0 Field Operational Tests (Enabling Technologies Team)

PRODUCTIVITY

- ▶ Wind and bridge response data base (Bridge Design and Hazard Mitigation Team)

- ▶ Seismic risk assessment, bridge retrofitting, and retrofitting of other highway structures manuals (Bridge Design and Hazard Mitigation Team)

- ▶ New permeability tests for concrete (High-Performance Bridge Materials Team)

- ▶ Bridge foundations innovative load testing procedures (Geotechnical Team)

- ▶ Geotechnical information and automated design system (Geotechnical Team)

- ▶ Bridge maintenance painting knowledge-based system decision-making (Corrosion and Coatings Team)

Pavements

- ▶ IVESYS (pavement-performance prediction model); VSIM (vehicle dynam-

- ▶ Assessment of Societal and Institutional Issues for IVI (Enabling Technologies Team)

- ▶ Identification of Sensor-Friendly Vehicle and Roadway Methods (Enabling Technologies Team)

- ▶ Evaluate Technologies for Specialty Vehicles (Enabling Technologies Team)

- ic model); and EAROMAR (pavement life-cycle cost model) improvements (Infrastructure Inspection and Management Team)

- ▶ ROSAN gyroscopic cross-slope measurement prototype device (Infrastructure Inspection and Management Team)

- ▶ Hot-mix asphalt construction prototype performance-related specifications (Asphalt Pavement Team)

- ▶ Measure the workability of PCC prototype test equipment and procedure (Portland Cement Concrete Pavement Team)

- ▶ PCCP improved PaveSpec software for developing performance-related specifications (Portland Cement Concrete Pavement Team)

- ▶ DataPave, product training, rigid pavement design, and LTPPBIND (Long Term Pavement Performance Team)

Traffic Management Systems

- ▶ Traffic Management Center (TMC) National Pooled Fund Project: develop plan and initiate studies (Traffic Management Team and Human Center System Team)
- ▶ Preliminary Human Factors Guidelines for TMCs (Human Center System Team)
- ▶ ErgoTMC Multimedia Web Site and Advanced TMC Workshop to support Preliminary Human Factor Guidelines for TMCs (Traffic Management Team)

Traffic Management Systems/ITS

- ▶ ITS Deployment Analysis System (IDAS) (Traffic Management Team)
- ▶ Adaptive Control Systems (ACS)
 - Field evaluation at 4 sites
 - Initiate ACS "Lite" development (Traffic Management Team)
- ▶ Advanced Transportation Controller and Cabinet Specifications (Traffic Management Team)
- ▶ Traffic Estimation and Prediction System (TrEPS)
 - Complete laboratory evaluation
 - Initiate field evaluations (Traffic Management Team)
- ▶ Strategic Work zone Analysis Tools (SWAT) (Traffic Management Team)
- ▶ Traffic Software Integrated System (TSIS), Version 5.0 (Traffic Management Team)

- ▶ New Traffic Simulator
 - Request for information
 - Stakeholder forums
 - Begin design and development (Traffic Management Team)
- ▶ Advanced Traffic Management System Research Analysis Database System (ARADS) (Traffic Management Team)
- ▶ Provide Program Support for ITS on Applications of Dedicated Short Range Communications (Enabling Technologies Team)

Nationwide Differential GPS

- ▶ Establishment of NDGPS Base Stations (Enabling Technologies Team)
- ▶ Coverage Verification Test Jig (Enabling Technologies Team)

Structures

- ▶ Concrete members prestressed with fiber-reinforced polymer composite materials specifications (High-Performance Bridge Materials Team)
- ▶ Timber bridge inspection manual (Bridge Design and Hazard Mitigation Team)
- ▶ Culvert installation for AASHTO bridge specifications recommended provisions (Bridge Design and Hazard Mitigation Team)
- ▶ Micropiles in seismic areas design guidelines manual (Geotechnical Team)

- ▶ Bridge-inspection condition rating based on the validation of visual inspection guidelines (Infrastructure Inspection and Management Team)
- ▶ Bridge conditions and compositions in the (United States) comprehensive summary (Infrastructure Inspection and Management Team)

Pavements

- ▶ Superpave binder fatigue criteria in ALF experiment validation (Asphalt Pavement Team)
- ▶ Modified asphalt binders evaluation protocols (Asphalt Pavement Team)
- ▶ Crumb rubber and other modified binders evaluations (Asphalt Pavement Team)
- ▶ HIPERPAV software and supporting documentation (Portland Cement Concrete Pavement Team)
- ▶ Materials-related distress in concrete pavements guidelines (Portland Cement Concrete Pavement Team)
- ▶ Materials and procedures for curing concrete pavements guidelines (Portland Cement Concrete Pavement Team)
- ▶ Petrographic revised, Web-based manual (Portland Cement Concrete Pavement Team)

- ▶ Highway Effects on Vehicle Performance (Corrosion and Coatings Team)
- ▶ Environmental Impact of Construction and Repair Materials on Surface and Ground Waters (Corrosion and Coatings Team)
- ▶ Management of the Discharge and Quality of Highway Runoff in Karst Areas to Control Impacts to Ground Waters (Corrosion and Coatings Team)
- ▶ Evaluations of Near Highway Dispersion Mechanics for Air Pollutants (Corrosion and Coatings Team)
- ▶ Intersection Model for Air Quality (Corrosion and Coatings Team)
- ▶ Investigation of Environmental Impacts of Recycled Materials (Corrosion and Coatings Team)
- ▶ Nationwide Differential Global Positioning System (Enabling Technologies Team)

For faster access to details about these items, go to the [Unit Plan Website](#).

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Geotechnical Team
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Safety Management Team
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Transportation Operations Team
(planned)

Corrosion and Coatings Team
Bob Kogler, Team Leader

Human Centered Systems Team
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Freight Team (future)

Infrastructure Inspection and Mgmt. Team
Roy Trent, Team Leader

Asphalt Pavement Team
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Portland Cement Concrete Pvmnt. Team
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