



Conference on  
Remote Sensing and Spatial Information Technologies for  
Transportation

# Products and Results: Foundations for the Future

*Organized By:*  
Transportation Research Board

*Sponsored By:*  
U.S. Department of Transportation  
Research and Special Programs Administration

*Co-Sponsored By:*  
American Association of State Highway and Transportation Officials (AASHTO)  
NASA



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December 10-12, 2001  
National Academy of Sciences  
2101 Constitution Avenue, Washington, D.C.



Dear Conference Participants:

Transportation agencies at all levels face unprecedented challenges today. Increasing demands are being placed on these agencies to preserve the existing transportation system and to take on new missions. A variety of advanced technologies are available to enhance planning, designing, managing, operating, and maintaining all modes of transportation. Aerial and satellite remote sensing represents one area experiencing rapid development. The U.S. Department of Transportation has initiated a major research program focusing on transportation-related applications of aerial and satellite remote sensing.

This year's conference builds on the 2000 Remote Sensing for Transportation Conference and the work of the four university consortia and technology application projects. The conference subtitle *Products and Results: Foundations for the Future* reflects the emphasis, demonstrating value of remote sensing for the transportation community. The core of the program is four general sessions focusing on the four themes of the US DOT research program highlights the research and product development achieved. Each session is chaired by an experienced transportation professional, who will set the context for the session and then summarize the current state of implementation. The *Technology Buffet* will be the opportunity for one on one exchange about the projects. Five workshops on Monday afternoon offer additional information about key topics, including a basic remote sensing primer for those transportation professionals new to the topic.

This conference presents an excellent opportunity for transportation to: (1) enhance communication between the transportation and remote sensing communities; (2) develop a common understanding of current successful remote sensing transportation applications; and (3) craft strategies for remote sensing implementation in transportation.

I hope you can participate in this challenging event!

David Ekern  
Conference Chair  
Assistant Commissioner  
Minnesota Department of Transportation

## **Products and Results: Foundations for the Future**

### **Preliminary Program**

**Monday, December 10, 2001**

#### **Roundtable for States and MPOs**

**8:00 AM      12:00 PM**

**Dave Gorg**, *Minnesota DOT* and **Roger Petzold**, *FHWA*

This Roundtable is an opportunity for transportation organization staff to share experiences & strategies in use of remote sensing in an informal setting. Topics include current programs & funding, new initiatives, successful strategies and partnerships, and barriers. Each state is expected to make an informal presentation. The Roundtable is open to all state DOTs and MPOs. Please contact Dave Gorg, [dave.gorg@dot.state.mn.us](mailto:dave.gorg@dot.state.mn.us) or (651) 296-5710, in advance for an invitation and agenda.

#### **Technology Buffet**

**1:00 PM      5:00 PM**

The Technology Buffet assembles poster and computer displays showcasing: (1) the projects and Application Guidebooks of the four University Consortia; (2) Technology Application Projects funded by the U.S. Department of Transportation; and (3) other remote sensing applications in transportation. The Buffet opens during the workshops on Monday. Project staff will be available to discuss details of their work during the Tuesday lunch and reception.

#### **Workshops**

**1:00 PM      5:00 PM**

##### **INTRODUCTION TO REMOTE SENSING WORKSHOP**

This workshop will provide an overview of remote sensing for those transportation professionals unfamiliar with the technology. It will acquaint the audience with the technologies used to acquire imagery and how the image data is changed into information products for use in a transportation application. While no fee is charged for the workshop, attendance should be indicated on the registration form to assure space. This is essentially the same workshop offered last year at the Conference on Remote Sensing and Spatial Information Technologies for Transportation.

Moderator: **Roger King**, *Mississippi State University*

Remote Sensing Process, **Rick Watson**, *University of New Mexico*, 1:00 PM-2: 00 PM

Remote Sensing Sensors, **Roger King**, *Mississippi State University*, 2:00 PM-3: 00 PM

Techniques to Process Remote Sensing Data, **Carolyn Merry**, *Ohio State University*,  
3:00 PM-4: 00 PM

Applications of Remote Sensing, **Chuck O'Hara**, *Mississippi State University*, 4:00 PM-  
5: 00 PM

**1:00 PM     2:45 PM**

**SUCCESSFUL PUBLIC AND PRIVATE PARTNERSHIPS FOR PROCURING AND UTILIZING REMOTE SENSING IMAGERY WORKSHOP**

The Case of Pima County, Arizona

Pima County Association of Governments will describe how their regional GIS, digital orthophoto project, and regional data center have been instrumental in fostering the cooperation and coordination among local jurisdictions that have made our successes possible. The workshop will incorporate a variety of applications, which will feature both public-sector and private-sector users and include original audio and video clips, graphics and animation, along with high-quality orthophoto images, in order to illustrate the ways in which users actually make use of the new tools.

Moderator: **Val Noronha**, *University of California, Santa Barbara*

**Jim Altenstadter**, Deputy Executive Director, *Pima County Association of Governments*

**Ron Platt**, GIS Coordinator, *City of Tucson Department of Transportation*

**Steve Whitney**, GIS Manager, *Pima County*

**Andy Gunning**, Regional Planning Director, *Pima County Association of Governments*

**3:15 PM     5:00 PM**

**THE NATIONAL MAP, A FRAMEWORK FOR INSTITUTIONAL INTEROPERABILITY WORKSHOP**

This year the U.S. Geological Survey proposed the concept of a digital National Map. This National Map is to be available in 2010. A nation-wide file of street centerlines, maintained up-to-date to within seven days is part of the proposal. Also this year the Geography Division of the Bureau of the Census began an ambitious TIGER Modernization Plan that requires as part of its end result a nation-wide digital street centerline file that will support the 2010 decennial Census. The U.S. Department of Transportation also has an interest in an accurate and continuously maintained digital nation-wide street centerline file. In 2010 will we have three different governmental street centerline files plus a myriad of derivative and private vendor files for the roads of the U.S. This workshop tries to explore the commonality of requirements of the three government agencies for a digital national street centerline file.

Moderator: **Joel Morrison**, *The Ohio State University*

The National Map Concept, **Michael Domaratz**, *U.S. Geological Survey*

MAP/TIGER Accuracy Enhancement, **Robert Marx**, *Geography Division, U.S. Bureau of the Census*

The Department of Transportation Needs for a Digital Street Centerline File, **Steve Lewis**, *U.S. Department of Transportation*

**1:00 PM – 5:00 PM**

#### **APPLYING REMOTE SENSING TECHNOLOGY TO AIRPORTS WORKSHOP**

The forecast demand for air travel in the near future can only be met by increased aircraft operations at existing or future runway improvements. To maintain a high degree of operational efficiency and safety while making airside and landside improvements, the FAA and airports are increasingly relying on GIS, CADD and other spatial technologies. Remote sensing technologies, specifically LIDAR and high-resolution satellite or airborne imagery, are helping to fulfill the growing need for spatial data at airports. This half-day workshop will present the results of some recent projects at airports that have utilized remote sensing and GIS technology, discuss the findings of important research in this area, review the standards initiatives that will facilitate further adoption of remote sensing technologies and offer some insights into the future of remote sensing at airports. Airport staff, state aviation officials, FAA personnel and anyone with an interest in spatial data at airports are welcome to attend. Instructors include:

**Michael McNerney**, *DMJM Aviation*. Dr. McNerney is the Chairman of the AAAE Airport GIS Committee and TRB Aircraft/Airport Capability Committee. He is an experienced airport engineer and has been a pioneer in the application of GIS and spatial data at airports.

**Randy Murphy**, *Grafton Technologies, Inc.* Mr. Murphy is the founder of Grafton Technologies, a firm dedicated to the advancement of spatial technologies for airports. He has led a NASA funded investigation of the use of high-resolution satellite imagery at airports and is currently working under a DOT grant to apply these technologies to regional planning around airports.

**Mike Aslaksen** and **Jason Woolard**, *National Geodetic Survey (NGS)*. NGS has begun several research initiatives into the use of remote sensing to support airport obstruction mapping.

**Grady Tuell**, *The University of Florida*. The University of Florida has conducted research into the use of LIDAR as a means to identify obstructions to navigable airspace at airports.

**1:00 PM – 5:00 PM**

#### **A FAST-TRACK APPROACH TO NEPA STREAMLINING AND ENVIRONMENTAL ASSESSMENT: TECHNOLOGY DEMONSTRATION PROJECT**

Recent advances in photogrammetry and airborne remote sensing can be used to provide engineering quality mapping quickly and cost-effectively. These high-resolution, high accuracy data sources can be acquired over large project areas for evaluation of multiple alternative corridors in the NEPA permitting process. Acceptance of technologies such as airborne GPS, inertial measurement, LIDAR and high-resolution hyperspectral imagery by state DOT's faces a number of challenges. Highway design engineers, DOT photogrammetrists and wetlands biologists must be confident of the reliability and accuracy of these data in a high-volume map production environment. These new data types must be integrated into existing workflows in a way that

engineering and environmental assessment tasks are user-friendly. The quality of the final results must meet stringent DOT specification. This workshop documents a demonstration project conducted by EarthData International of North Carolina and the North Carolina Department of Transportation. Detailed results from the demonstration project will be distributed, along with sample data sets and technical scope of work documents, to workshop attendees.

Moderator: **Karen Schuckman**, Senior Vice President, *EarthData Technologies, LLC*

**Keith Johnston**, State Photogrammetric Engineer, *North Carolina Department of Transportation*

**Steven Mah**, Vice President, Commercial Applications, *ITRES Inc.*

**Chuck O'Hara**, Associate Research Professor, *Mississippi State University*

## Products and Results: Foundations for the Future

### Conference

Tuesday, December 11, 2001

**8:30 AM      9:30 AM**

#### **OPENING SESSION**

Welcome, **Robert E. Skinner**, *Executive Director, Transportation Research Board (TRB)*

Setting the Stage, **David S. Ekern**, *Minnesota DOT and Conference Committee Chair*

Building the Foundation for 21st Century Transportation, **Ellen G. Engleman**,  
*Administrator, Research and Special Programs Administration (RSPA), invited*

Remote Sensing and Challenges, **Courtney Stadd**, *NASA, invited*

DOT Program Progress - Building RS Foundation for Transportation, **K.  
Thirumalai**, *Research and Special Programs Administration (RSPA), U.S. DOT*

**9:30 AM      11:00 AM**

#### **ENVIRONMENTAL STREAMLINING, OVERVIEW OF REMOTE SENSING PRODUCTS AND RESULTS**

Moderator: **Ian MacGillivray**, *Director, Research Management, Iowa DOT*

MISSISSIPPI STATE UNIVERSITY CONSORTIUM, NATIONAL CONSORTIUM FOR REMOTE SENSING IN  
TRANSPORTATION – ENVIRONMENT

Overview of the Remote Sensing for the Environment initiative and Projects  
Featured in the Technology Buffet, **Roger King**, *Mississippi State University*

Remote Sensing of Environmental Parameters for Use in the NEPA  
Documentation in Support of Highway Corridor Studies, **Gary Erenrich**, *ICF  
Consulting*,

Airborne Sensor Fusion: A Fast-Track Approach to the NEPA Streamlining and  
Environmental Assessment, **Karen Schuckman**, *EarthData International*

Evaluating Remote Sensing for I-405 Corridor Programmatic NEPA Analysis,  
**Elizabeth Lanzer**, *Washington State DOT*

Observations on the current state of remote sensing applications for transportation environmental  
streamlining, and on future contributions these technologies can make.

**Ian MacGillivray**, *Director, Research Management, Iowa DOT*

**11:30 AM 1:00 PM**

**TRANSPORTATION PLANNING, OVERVIEW OF REMOTE SENSING PRODUCTS AND RESULTS**

Moderator: **Randy Halvorson**, *Director – Program Delivery, Minnesota DOT*

THE OHIO STATE UNIVERSITY CONSORTIUM, NATIONAL CONSORTIUM FOR REMOTE SENSING IN TRANSPORTATION-FLOWS

**Joel L. Morrison and Mark F. McCord**, *The Ohio State University*

The Consortium's presentation will summarize the research work at the member universities (The Ohio State University, the University of Arizona, and George Mason University) and other activities completed during the consortium's first year. It will include the work of the three first year demonstration projects and summaries of the planned work of the three second year demonstration projects. The nine Consortium projects cover three areas: traffic monitoring, traffic management, and freight and intermodal. The first year demonstration projects are:

- Remote Sensing Applications in Transit, *Bridgewater State College*
- Road Network Planning Tool, *Technology Services Corporation*

Second year technology demonstration projects just starting include the following:

- Remote Sensing for Airport Development and Transportation Planning, *Grafton Technologies, Inc.*
- Unmanned Airborne Data Acquisition System (ADAS), *GeoData Systems*
- Invasive Aquatic Plant Obstruction in Navigable Waterways, *TerraMetrics, Inc.*

Observations on the current state of remote sensing applications for transportation planning, and on future contributions these technologies can make.

**Randy Halvorson**, *Director – Program Delivery, Minnesota DOT*

**1:00 PM 2:00 PM**

**LUNCH AND TECHNOLOGY BUFFET**

Meet with project staff to find the keys to success in remote sensing.

**2:00 PM 3:30 PM**

**INFRASTRUCTURE AND ENGINEERING, OVERVIEW OF REMOTE SENSING PRODUCTS AND RESULTS**

Moderator: **John Conrad**, *Chief Engineer/Deputy Director, Washington State DOT*

UNIVERSITY OF CALIFORNIA, SANTA BARBARA, NATIONAL CONSORTIUM FOR REMOTE SENSING IN TRANSPORTATION – INFRASTRUCTURE

**Overview of NCRST-Infrastructure**

The role of spatial information in infrastructure management, and the interplay between remote sensing, data modeling, data delivery and process modeling in building functional solutions.

**Mike Goodchild**, *University of California, Santa Barbara*

### Asset Management Using Aerial Photography

This describes one of several current Infrastructure projects in depth. A number of infrastructure elements are inventoried from aerial photographs. Road length, lane width and other geometric parameters of road infrastructure are captured for Iowa DOT's linear referenced inventory. Remote sensing methods are compared with field observation approaches.

**Shauna Hallmark**, *Iowa State University*

### Centerlines and Infrastructure Inventory

A review of approaches to centerline extraction using different types of imagery, for various application scales and user requirements. Early results are presented, and compared with GPS. This presentation also summarizes other Infrastructure research and future directions.

**Val Noronha**, *University of California, Santa Barbara*

**John Conrad**, *Chief Engineer/Deputy Director, Washington State DOT*

Observations on the current state of remote sensing applications for transportation infrastructure and engineering, and on future contributions these technologies can make.

**4:00 PM**      **5:30 PM**

## **TRANSPORTATION LIFELINES AND HAZARDS, OVERVIEW OF REMOTE SENSING PRODUCTS AND RESULTS**

Moderator: **Walter H. Kraft P. E.**, *Vice President, Parsons Brinckerhoff Quade & Douglas, Inc., Parsons Brinckerhoff/Farradyne*

UNIVERSITY OF NEW MEXICO CONSORTIUM, NATIONAL CONSORTIUM FOR REMOTE SENSING IN  
TRANSPORTATION – HAZARDS

### Remote Sensing Issues in Safety, Hazards, and Disaster Assessment

A discussion of the central issues regarding the application of remote sensing to the assessment of safety, hazards, and disasters in transportation.

**Stan Morain**, *Director, Earth Data Analysis Center, the University of New Mexico* and Principal Investigator for NCRST-SHDA.

### Remote Sensing Applications for Mapping Avalanche Hazards

A discussion of how remote sensing technologies have been applied to the mapping of roadway risk and avalanche hazards in the Wasatch Mountains of Central Utah, site of the 2002 Winter Olympics.

**Tom Cova**, *University of Utah*.

### Anatomy of an Application: Remote Sensing and Airport Flight Path Obstructions

A discussion of the requirements, process and planning for obstruction mapping around modern airports.

**Rick Watson**, *Earth Data Analysis Center*.

### Airborne Ground Penetrating Radar for Detection of Subterranean Pipelines and Spills

A presentation of the technology and results for detecting and mapping pipelines and spills from an airborne platform using ground-penetrating radar.

**Bob Davis**, *Aeris Inc.*

### LIDAR Applications in Pipeline Mapping and Safety

The discussion of the application of LIDAR technology to mapping pipeline rights of way.

**Vincent Tao**, *York University*.

### Rural Road Trafficability and Maintenance: Remote Sensing Applications,

A presentation describing how remote sensing technologies are applied to the issues of trafficability and maintenance in the American Southwest.

**Doug Fuller**, *George Washington University* and **Rick Watson**, *Earth Data Analysis Center*.

Observations on the current state of remote sensing applications for transportation safety, hazards, and disaster assessment, and on future contributions these technologies can make.

**Walter Kraft**, *Vice President, Parsons Brinckerhoff/Feradine*

**5:30 PM**      **7:00 PM**

### RECEPTION AND TECHNOLOGY BUFFET.

Meet with project staff to find the keys to success in remote sensing.

## Wednesday, December 12, 2001

**8:30 AM**      **9:30 AM**

### REMOTE SENSING INDUSTRY FORECAST

ASPRS, together with NASA and several other collaborating organizations, is in the midst of producing a Ten-Year Remote Sensing Industry Forecast. The study will include Commercial market projections for data collection (space-based and aerial), data processing, tools and support services, value-added reselling, and other product lines by market segment, as well as projections of educational and work force demands and research and development trends. Plasker will present the current status and findings.

**James R. Plasker**, *Executive Director, the American Society for Photogrammetry and Remote Sensing (ASPRS)*

**10:00 AM 12:00 PM**

**THE STATE OF REMOTE SENSING IN TRANSPORTATION**

This panel will discuss the progress in using remote sensing technologies for transportation. The panel includes both experienced transportation professionals and remote sensing experts. They will consider the progress in research and implementation made over the last few years and suggest areas that need additional effort. The session will provide an opportunity for attendees to contribute their progress assessments.

Moderator: **David Fletcher**, *President, GEODIGM*

*Panelists*

**Ian MacGillivray**, *Director, Research Management, Iowa Department of Transportation*

**Randy Halvorson**, *Assistant Director - Program Delivery, Minnesota Department of Transportation*

**John Conrad**, *Chief Engineer/Deputy Director, Washington State Department of Transportation*

**Walter H. Kraft**, *Vice President, Parsons Brinckerhoff/Farradyne*

**Jeff Tayman**, *Director of Research and Information Systems, San Diego Association of Governments*

**John Jensen**, *Carolina Distinguished Professor, University of South Carolina*

**Lawrie Jordan**, *President, ERDAS*

Audience Assessment

**12:00 PM** Adjourn

Conference Steering Committee meets to review conference, draft recommendations and make plans for the 2002 meeting.
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## **Products and Results: Foundations for the Future**

### **TECHNOLOGY BUFFET PROJECTS**

**MONDAY 1:00 PM 5:00 PM**

**TUESDAY 11:30 AM 7:00 PM**

#### **Mississippi State University Consortium National Center on Remote Sensing in Transportation Environment**

Air Quality Analysis Using Differential Absorption Lidar

Regional Scale Watershed Assessment

Regional Land Cover Classification and Change Detection

Assessing the Need for Remotely Sensed Data for Environmental Analysis

Hyperspectral Remote Sensing for Identification of Wetlands

#### **Associated Technology Application Projects**

Remote Sensing of Environmental Parameters for Use Streamlining the NEPA Process, *ICF Consulting*

Airborne Sensor Fusion: A Fast-Track Approach to the NEPA Streamlining and Environmental Assessment, *EarthData Technologies*

#### **The Ohio State University Consortium National Center on Remote Sensing in Transportation Flows**

Satellite-based Data: Proof of Concepts and Operational Issues

Statistical Modeling for Traffic Monitoring

Needs assessment and allocation of imaging resources for transportation planning and management

Using airborne-based data in real-time network state estimation, prediction and management

Truck rest area availability and utilization

Freight and intermodal flow analysis

Spectral research program

Validation of remote sensing techniques for traffic flow

Traffic management - sensor and platform issues

### **ASSOCIATED TECHNOLOGY APPLICATION PROJECTS**

Remote Sensing Applications in Transit, *Bridgewater State College*

Road Network Planning Tool, *Technology Services Corporation*

## **University of California, Santa Barbara Consortium National Center on Remote Sensing in Transportation Infrastructure**

Road Centerlines: Using hyperspectral imagery to identify pavement materials; linear filtering to distinguish roads from rooftops; vectorization and post-processing to create centerlines. Data modeling. Cost-comparison against GPS.

BridgeView: ArcView extension, presents different scales of imagery and GIS layers as user zooms in on object of interest. Interactive tools allow user to adjust location of bridge with reference to imagery, for compliance with National Bridge Inventory requirements.

Asset Inventory: Feature extraction from large scale photography. Analysis of DOT user requirements, comparison of different scales of imagery and their utility with respect to user needs.

Airport Layout and Airspace Analysis: Use of LIDAR and digital photography to create orthophotos for airport layout plans, and to identify potential obstructions to airspace.

Fostering Cooperation with a Regional GIS, Digital Orthophoto Project and Regional Data Center, Pima Association of Governments

### **ASSOCIATED TECHNOLOGY APPLICATION PROJECTS**

Facilitating the Operational Efficiency and Growth of Intermodal Freight Traffic. Application of Remote Sensing Technology to the Alameda Corridor, Los Angeles, CA, *Tetra Tech ASL*

Impact of Instant Imagery Access on a Regional Database for Transportation Planning, *Orbital Imaging Corporation (ORBIMAGE)*

Florida DOT's Roadway Inventory Data Collection

## **University of New Mexico Consortium National Center on Remote Sensing in Transportation Hazards**

Roadway Risk and Avalanche Hazards: InSAR derived DEM, Landsat imagery, and other remotely sensed data are used to assess the potential threat of avalanches to transportation infrastructure. An automated procedure to assess roadway risks will be demonstrated, *University of Utah*

Pipeline Mapping and Safety: LIDAR, hyperspectral data, and airborne ground penetrating radar are used to map and assess pipelines. Remote sensing techniques are used to replace or augment existing methods. Imagery and visualizations illustrating how these technologies are used for mapping and safety assessment of pipelines, *York University, Aeris, Inc., DigitalGlobe*

Rural Road Trafficability and Maintenance: Remotely sensed imagery are integrated with Doppler radar, topographic data, soils, and transportation infrastructure maps to assess damage to roads and related infrastructure resulting from localized rainfall and flooding. The system classifies road segments by surface condition and maintenance requirements allowing the efficient deployment of maintenance resources following significant rainfall/flooding events, *Earth Data Analysis Center & George Washington University*

Airport Flight Path Obstructions Identification: LIDAR and digital photography are used to identify glide path obstructions in accordance with NIMA and FAA requirements for the Federal Airfield Initiative, *Earth Data Analysis Center*)

Remote Sensing and Evacuation Planning: The integration of remotely sensed data into the Oak Ridge Evacuation Modeling System (OREMS) allows the rapid updating of transportation infrastructure. The use of the Oak Ridge Evacuation Modeling System for the evaluation of alternative evacuation scenarios in response to changing road conditions and closures is demonstrated, *Oak Ridge National Laboratory*)

### **ASSOCIATED TECHNOLOGY APPLICATION PROJECT**

Airborne Ground Penetrating Radar for Detection of Subterranean Pipelines and Spills: A presentation of the technology and results for detecting and mapping pipelines and spills from an airborne platform using ground-penetrating radar, *Aeris Inc.*

## **Products and Results: Foundations for the Future**

### **National Consortia for Remote Sensing in Transportation**

#### **National Consortium for Remote Sensing in Transportation – Disaster Assessment, Safety & Hazards**

The focus of the Safety, Hazards and Disaster Assessment consortium's research is on the development of analytical tools to identify, map, and assess hazards and plan for disasters as they affect transportation systems. The application of remote sensing to safety and disaster planning and assessment provides an opportunity to monitor hazards, evaluate the impacts of natural and man-made disasters, and to plan for evacuation and maintenance of transportation lifelines. Computer analysis procedures designed to extract these transportation lifelines from satellite imagery are being developed to improve the availability of emergency and disaster relief services for thousands of people who find themselves isolated by natural and man-made disasters and health emergencies. The consortium is developing methods that provide for the integration of remotely sensed imagery into evacuation planning and implementation, and to the assessment of natural and man-made disasters. The goals of this effort are to provide local, state, and national transportation agencies the tools necessary to rapidly and effectively address issues of safety, hazards, and disaster assessment using the most up-to-date methods and information available.

University of New Mexico

The George Washington University

Oak Ridge National Laboratory

The University of Utah

<http://riker.unm.edu/dot/intro.htm>

#### **National Consortium for Remote Sensing in Transportation Environmental Assessment**

The theme of this consortium is the development of remote sensing solutions that more efficiently move transportation projects from the planning to the construction stage. Since the passage of the National Environmental Policy Review Act of 1969 (NEPA), the Clean Air Act, the Clean Water Act, the Intermodal Surface Transportation Efficiency Act, and other related legislation, transportation agencies have been obligated to process transportation projects through often rigorous and time-consuming environmental reviews. The necessity for these reviews is evident, however, the best use of remotely sensing information products to efficiently plan alternative routes and to assess their environmental impacts must be provided. Therefore, this consortium is exploring how remote sensing technology

solutions may be used for streamlining the environmental assessment process and validating the usefulness of remote sensing imagery for providing the information necessary to meet environmental reviews. The end result is to more beneficially utilize a transportation agency's time and resources during the review process and expedite moving into the construction phase with the optimum route.

Mississippi State University  
University of Mississippi  
Auburn University  
Global Hydrology and Climate Center  
University of Alabama in Huntsville  
Universities Space Research Associates  
Digital Globe  
Intermap Technologies, Inc.  
EarthData Technologies, LLC  
Itres, Inc.  
<http://www.ncrts.msstate.edu>

## **National Consortium for Remote Sensing in Transportation Flows**

The emphasis of this consortium is on transportation flows in three areas: traffic flow monitoring, traffic flow management and intermodal flow activities. The use of remote sensing can enhance the efficiency of many of the present practices used to determine the level of service, vehicle miles traveled (VMT), average annual daily traffic (AADT), and vehicle classifications and counts. Remote sensing can also help to determine passenger and freight flows at intermodal centers (park and ride, ports, TOFC/COFC, air/rail/bus/ferry terminals), and to identify congestion points and patterns. Imagery can improve spatial accuracy, the visualization of traffic flows by the fusion of multisensor databases, and hypothesis generation.

The Ohio State University  
George Mason University  
University of Arizona  
[http://www.cfm.ohio-state.edu/info/NCRST\\_F/ncrst-f.html](http://www.cfm.ohio-state.edu/info/NCRST_F/ncrst-f.html)

## **National Consortium for Remote Sensing in Transportation Infrastructure Management**

Management of infrastructure involves systematic maintenance, operation, and renewal of assets such as pavement, bridges, pipelines, rail lines, harbors and airports. Information on the location and condition of these assets is critical to effective management. The consortium will employ both traditional and emerging technologies to build inventories of infrastructure and to improve the accuracy of map databases. Simpler methods, such as measurement of shoulder width and curvature from aerial photographs, will address the immediate needs of local agencies. At the high end, automated recognition procedures will be developed to detect distinctive patterns such as paved highways, parking lots and airports. Hyperspectral imagery will show subtle differences in material composition, thereby helping to build inventories of bridges and to examine deterioration of pavement. Fusion of LIDAR and digital photography will enable development of as-built databases of transportation corridors and associated infrastructure such as building footprints and elevations.

University of California-Santa Barbara

University of Wisconsin-Madison

University of Florida

Iowa State University

<http://www.ncgia.ucsb.edu/ncrst/>

## **Products and Results: Foundations for the Future**

### **Logistics**

#### **LOCATION**

The conference will be held at the National Academy of Sciences Headquarters, which is located on the National Mall in downtown Washington, DC, with ready access to DC's tourist spots.

The National Academy of Sciences  
2101 Constitution Avenue, NW  
Washington, DC 20418

#### **ACCOMMODATIONS**

The conference hotel is the State Plaza, which is within walking distance of the National Academy of Sciences building. Call 800-424-2859. Use the conference code of **6323**.

The State Plaza Hotel  
2117 E Street, NW  
Washington, DC 20037  
(202) 833-6965

#### **REGISTRATION**

The registration fee for the conference is **\$95**. No fee will be charged for the Monday afternoon workshops on remote sensing. Register via the Internet by going to [www.cvent.com](http://www.cvent.com). Click on the "RSVP." Tab at the top left of the screen. Enter event code "HUJQ9E6AHK" and click "Go." When the next screen appears, click on "Invitation", and then on "Yes" at the bottom. Complete all registration information.

#### **FOR MORE INFORMATION:**

Program: Thomas Palmerlee, TRB, (202) 334-2907, [tpalmerl@nas.edu](mailto:tpalmerl@nas.edu)

Registration: Fred Scharf, TRB, (202) 334-2966, [fscharf@nas.edu](mailto:fscharf@nas.edu)