

MOVING FORWARD




"He who does not look ahead, remains behind." (Spanish Proverb)

Ohio Department of Transportation, Office of Research and Development

2008 Volume 1

Request for Proposals - FY 2009

The Ohio Department of Transportation's Office of Research and Development is now accepting proposals for the following research studies:



RFP #	Project Title
PS-09-02	Tracking of Indiana Bat Migration
PS-09-03	Update Data and Procedures for Estimating Design Hour Volume
PS-09-04	Rapid Orthophoto Development System
PS-09-05	Statistical Validation of Speeds and Travel Time Provided by a Data Service Provider
PS-09-06	Long Term Validation of an Accelerated Polishing Test Procedure for HMA Pavements
PS-09-07	GPS-Based Household Interview Survey for the Cincinnati, Ohio Region
PS-09-09	Resilient Modulus Predictive for Granular Base and Subgrade
PS-09-10	Develop Traffic Counter Bench Tester with 8-Lane Testing Capacity

To view the problem statements, please visit the R&D website at: <http://www.dot.state.oh.us/divplan/research/announcements/announcements.htm>. Formatting and submission guidelines for proposals are also available on-line at <http://www.dot.state.oh.us/divplan/research/Forms/forms.htm>. Be sure to review the guidelines carefully. **All** questions concerning RFPs, including technical clarifications of the projects, should be directed to the Office of Research and Development at research@dot.state.oh.us or 614-644-8135. Clarifications will be posted to the announcements page of our website as they become available.

The advertised projects are expected to begin during fiscal year 2009 (July 1, 2008 - June 30, 2009). Additional proposals on research studies not listed above are currently being accepted for the ODOT Partnered Research Exploration Program (OPREP). For additional information on OPREP, please see page 2 or the announcements page of our website.

The deadline for submitting proposals is **4:30 PM (EST) on March 3, 2008**. All submissions must be **received** by this time. **Absolutely no late proposals will be accepted. No extensions or exceptions will be made to this deadline.** Non-compliance with the formatting and submission guidelines is cause for the rejection of a proposal. The Department reserves the right to reject any and all proposals. Announcement of selected researchers for fiscal year 2009 will be posted on the R&D website by June 30, 2008.

OPREP 2009 Request for Proposals

The Ohio Department of Transportation's Office of Research and Development is now accepting proposals for the ODOT Partnered Research Exploration Program (OPREP). The OPREP Program was created to:

- Consider relevant transportation research needs that may not have been identified by ODOT and included in our Strategic Research Plan.
- Encourage genuine partnerships within the research community.
- Recognize that while ODOT research needs are primarily of an applied nature, support of some basic research is critical to the long-term success of transportation research.
- Provide an opportunity to demonstrate the viability of innovative concepts and their potential to address long-range transportation needs.
- Leverage research funds and resources.



To qualify as an OPREP project, the following criteria must be met and clearly defined in the proposal:

- An established partnership between at least two unaffiliated agencies
- A minimum of 50% of the total project cost must be provided by the proposing agency and/or its partner(s)
- A minimum of 10% of the total project cost must be provided by the partner(s)

For additional information on OPREP criteria, please visit the R&D website at: <http://www.dot.state.oh.us/divplan/research/announcements/announcements.htm>. OPREP projects are limited to a maximum duration of 16 months (including 4 months for the review and approval of a draft final report and draft executive summary). No more than 50% of the total project cost can be requested from ODOT for an OPREP project. Smaller percentages of the total project cost may be requested.

Proposal must be formatted in accordance with the ODOT Research Proposal Formatting and Submission Requirements, which are available on the R&D website (<http://www.dot.state.oh.us/divplan/research/Forms/forms.htm>). Noncompliance with these guidelines will invalidate the submission. The Department reserves the right to reject any or all submittals.

The deadline for OPREP consideration for fiscal year 2009 is **receipt by 4:30 PM (EST) on March 3, 2008**. ***Absolutely no extensions will be granted to this deadline.*** All items *received after* 4:30 PM on March 3, 2008 will not be considered for fiscal year 2009, but may be resubmitted for consideration for fiscal year 2010. Submissions should be made as instructed in the ODOT Research Proposal Formatting and Submission Requirements.

The Office of Research and Development will send a confirmation, via email, that submissions have been received. Announcement of OPREP awards for fiscal year 2009 will be posted on the R&D website by June 30, 2008.

If you have any questions about the OPREP program or the proposal requirements, please feel free to contact the Office of R&D at 614-644-8135 or via email at research@dot.state.oh.us. The OPREP program is available to anyone who is interested in performing transportation related research, so please feel free to share this information with fellow researchers.

ODOT R&D Issues Call for Student Study Problem Statements

Occasionally the need to conduct a small research study to provide a quick solution to problems arises. Being of limited scope, these studies do not warrant the time and expense required for typical research projects. When these problems would be amenable to the development of a graduate thesis, limited funds can be made available to initiate a student study project.

In the past, the scope of work for student studies has been generated solely by ODOT personnel. However, it has become clear that tremendous benefits can be experienced from considering external research ideas. Therefore, the Office of R&D is now accepting problem statements for student studies.

To qualify as a student study, the following criteria must be met:

Project Duration: 16 months (maximum). This includes 4 months for review and approval of a draft final report and executive summary prior to submitting final copies. Shorter durations will be considered; however the 4-month review/submission period for required reports must be included.

Limitation on Request for Funds: A maximum of \$20,000 is allowable for a student study. These funds are intended to cover the student's salary, report printing, and limited supplies and travel. Advisors for students performing these studies will serve as Principal Investigators, but charges for their time are ineligible for reimbursement. Universities are encouraged to represent these expenses and others, such as: tuition, fees, and overhead in excess of the limited rate, as cost-sharing on the budget form.

Requirements of the Student: The student assigned to the study must be:

- employed by the university,
- enrolled full-time in graduate school,
- a citizen or permanent resident of the United States, and
- a resident of the State of Ohio for a minimum of 1 year.

A letter from the University Registrar must be submitted with the problem statement which certifies that all of these conditions have been met by the student. Under special circumstances, student studies conducted by undergraduate students will be considered for universities that do not have a graduate school, but possess the expertise and facilities to conduct the work and meet all other requirements.

Required Reporting: All student studies require the submission of the following reports:

- quarterly progress reports submitted electronically to research@dot.state.oh.us;
- five (5) copies of a draft final report and draft executive summary submitted in hard copy 120 days prior to the contract completion date;
- ten (10) copies of an approved final report and approved executive summary submitted in hard copy by the contract completion date;
- two (2) electronic versions (one PDF and one DOC) of the approved final report and approved executive summary submitted by the contract completion date.



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Student Study PS Call Continued - From Page 3

To be considered for a student study, submit a problem statement to the Office of R&D by **4:30 PM (EST)** on **March 3, 2008**. **Absolutely no extensions will be granted to this deadline.** All items received after 4:30 PM on March 3, 2008 will not be considered. Formatting guidelines for student study problem statements are available on the ODOT R&D website at <http://www.dot.state.oh.us/divplan/research/announcements/announcements.htm>. Noncompliance with these guidelines will disqualify the submission from consideration. The Department reserves the right to reject any or all submittals.



Before submitting a problem statement, you may want to take a few moments to learn more about the direction in which the Department is headed. To learn more the ODOT's new business plan and strategic initiatives, see page 9. To learn more about the strategic research focus areas, see page 10.

The selection of student studies will be made by the Research Selection Committee in May 2008. Successful problem statements will be developed into proposals and are anticipated to begin during fiscal year 2009 (July 1, 2008 – June 30, 2009). Student studies are administrated in the same manner as standard research projects and are subject to the RD&T² Manual of Procedures. Time extensions may be granted, under special conditions, but no funding extensions will be approved. The standard ODOT educational organizational contracts will be used with modifications that address issues specific to these studies, such as the number of copies of the final report. If you have any questions about student studies or the problem statement requirements, please contact the Office of R&D at 614-644-8135 or via email at research@dot.state.oh.us.

Final Reports Available on the WWW

Final reports for research projects completed since 2000 are available on our website. Visit <http://www.dot.state.oh.us/research/default.asp> to get a copy of the following reports received since the last newsletter and many others:

Hydraulics

Topic 10: *Long-Term Monitoring of Pipe Under Deep Cover*, Ohio University (September 2007)

Pavements

Topic 47: *Truck/Pavement/Economic Modeling and In-Situ Field Test Data Analysis Applications Volume 4: Effects of Slab Shape and Load Transfer Mechanisms on Portland Cement Concrete Pavement*, Ohio University (September 2007)



International Scan - Research Management

Most developed nations support programs of research and technology on surface transportation issues. Regardless of the program's size, nearly all jurisdictions face similar challenges associated with limited funding, personnel, and other resources. Mix in growing demands for on-time, valid and useful research results and you can appreciate the need for research programs to be administered with peak performance and efficiency.



Transportation research program managers in the U.S. have been sharing best practices with one another for years, but in April 2008 a U.S. delegation will travel to Sweden, The Netherlands, Belgium, France, Japan, and South Korea to gather information on high-performing international programs that can be successfully applied in the United States. Eight general topics of interest have been identified to focus the teams' efforts:

- Identification and prioritization of short-term and long-term research needs
- Use of research to formulate effective policy
- Coordination among multiple jurisdictions to identify and address national priorities
- Information management and accessibility
- Opportunities for expanded leveraging and efficient use of research funds
- Opportunities for partnering and collaboration
- Effective program delivery
- Innovative techniques to measure and improve program performance
- Enhanced dissemination of research successes and demonstration of program value

The results of the scan will be documented in a final report. The team will also prepare a detailed implementation plan to ensure the widespread application of beneficial findings.

The team is co-sponsored by the American Association of State Highway and Transportation Officials (AASHTO), the Federal Highway Administration (FHWA), and the National Cooperative Highway Research Program (NCHRP). Membership consists of Debra Elston (FHWA), Dave Huft (South Dakota DOT), David Berdish (Ford Motor Company), Joyce Curtis (FHWA), Monique Evans (Ohio DOT), Barbara Harder (B.T. Harder, Inc.), Chris Jenks (TRB), Laurie McGinnis (Minnesota Center for Transportation Studies), Skip Paul (Louisiana DOT), Glenn Roberts (New Hampshire DOT), and Butch Wlaschin (FHWA).



ODOT Research Setting Milestones in the LiDAR Industry

By: John Ray, Office of Aerial Engineering

ODOT's Office of Aerial Engineering has been utilizing airborne Light Detection and Ranging (LiDAR) to generate planning and design products since implementing LiDAR technology in 2004. ODOT has become nationally recognized as a leader regarding the use of airborne LiDAR for engineering applications. Aerial Engineering's Administrator, John Ray, noted that focusing on quality and ODOT's specific needs versus other factors have been instrumental in allowing them to excel in the LiDAR field.

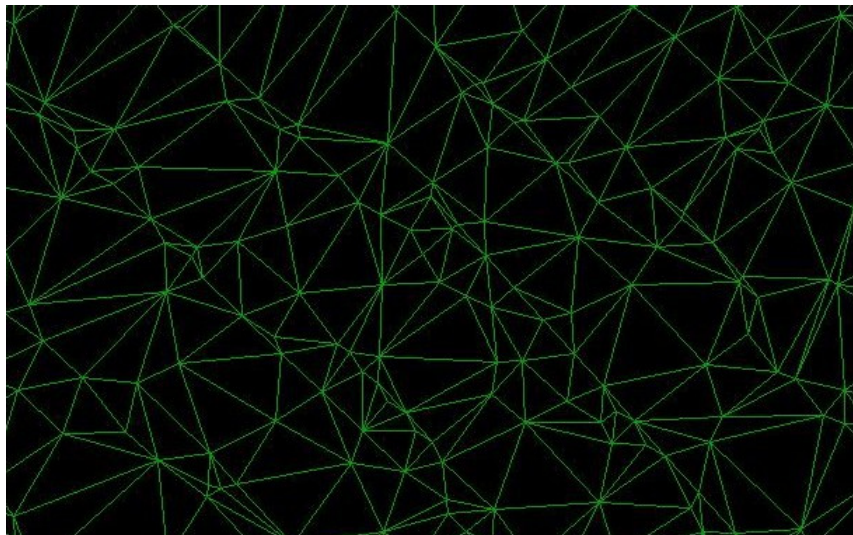


ODOT's Remoting Sensing Aircraft



LiDAR Sensor

When delivering LiDAR generated products such as a TIN (Triangulated Irregular Network) for design purposes, it is important to report the accuracy of the product for the end user. In determining the accuracy of a 3D product like a TIN, the horizontal and vertical components are typically represented separately. Calculating the accuracy of the vertical component is a relatively straight-forward procedure, you simply compare surveyed check points collected at specific areas of the project to the LiDAR generated TIN. The existing processing software performs this function easily.



Sample TIN (Triangulated Irregular Network)

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Determining the accuracy of the horizontal component, however, is much more challenging. The spacing between the individual LiDAR points (8-12 inches) and the spot size of the light when it hits the ground (approximately 6 inches) combine to make the horizontal position analysis very difficult. This difficulty has deterred the development of tools to perform the task (horizontal accuracy determination) in the past. Upon realizing that they could identify linear features such as pavement markings relatively well using the LiDAR intensity image (a grayscale representation of the intensity of the light reflected back from each light pulse), the possibility of being able to determine the horizontal accuracy using existing linear features such as pavement lane lines became apparent.



LiDAR Intensity Image

performed to determine the “degree of fit” and the associated statistics are provided. The statistics reveal any bias (shift) between the check points and the LiDAR dataset. The LiDAR data set is then adjusted to remove any bias and the horizontal accuracy calculated. OSU noted that ODOT’s LiDAR operations yield much higher horizontal accuracies (within 4-inches) than previously thought possible.

Aerial Engineering considers this project a major accomplishment in their desire to properly quantify the accuracy of the products being delivered as well as a significant milestone for the LiDAR industry as a whole. Current plans are to implement the procedures developed by OSU immediately upon completion into a commercially available software package already being used to process LiDAR data. This approach will allow integration of the new accuracy determination capabilities seamlessly into ODOT’s existing workflows and provide for future support of the software.

An OPREP proposal from Drs. Charles Toth and Dorota Brzezinska from The Ohio State University (OSU) entitled “Airborne LiDAR Reflective Linear Feature Extraction for Strip Adjustment and Horizontal Accuracy Determination” was subsequently selected to perform the work. At the last project progress meeting in October 2007, OSU noted that they had successfully developed unique algorithms to automatically identify the position of pavement markings within the LiDAR intensity data. The horizontal position of the pavement markings within the LiDAR dataset are then compared to the surveyed check points along the same pavement markings. An analysis is



LiDAR Computer Rack

Strategic Highway Research Program (SHRP) 2

In 2006, Congress established the second Strategic Highway Research Program (SHRP 2). SHRP 2 is a targeted, short-term, results-oriented program designed to advance highway performance and safety for highway users. SHRP 2 will focus on applied research in the following areas, which were identified by experts who began planning for the program in 1999. The focus areas were selected on the basis of their importance to the nation's economic system and quality of life and because strategically targeted research in these areas promises to yield high payoffs.



Safety – A goal of SHRP 2 is to significantly improve highway safety by understanding driver behavior thereby preventing or reducing the severity of highway crashes. The safety research within SHRP 2 will focus primarily on road departure and intersection collisions, which represent 58% of traffic fatalities nationwide. Vehicle-based and infrastructure-based technologies will be used to gather pre-crash, crash, and exposure data. Data will be analyzed and applied to safety countermeasures. Having a better understanding of the role human behavior and performance play in these types of collisions is essential to developing and improving countermeasures.



Renewal – SHRP 2 is focused on developing design and construction methods that cause minimal disruption while producing long-lasting facilities. Emphasis has been placed on achieving this level of performance consistently throughout the nation's highway system, not on just a few, high-profile projects. Meeting this goal will require an integrated approach involving engineering, finance, contracting, planning, safety, maintenance, and customer relations. To focus this research effort, eight tactics have been defined: (1) perform faster in situ construction, (2) minimize field fabrication effort, (3) perform faster construction inspection and monitoring, (4) facilitate innovative and equitable contracting environment, (5) plan improvements to mitigate disruption, (6) improve customer relationships, (7) design and construct low-maintenance facilities, and (8) preserve facility life.



Reliability – SHRP 2 is striving to reduce congestion and improve travel time reliability through incident management, response, and mitigation. Working towards this goal will require an integrated approach involving data, analysis, institutional architectures, tools, and operational strategies. Three theme areas have been identified to assist in this work: (1) building a foundation and institutional setting for operations, (2) improving performance by integrating operations into agency decision making, and (3) developing improved operations strategies for implementation.



Capacity – The highway system does not exist in a vacuum. It interacts with and is influenced by other aspects of society and nature. A focus of SHRP 2 is to conduct research that will develop approaches and tools for systematically integrating environmental, economic, and community requirements into the analysis, planning, and design of new highway capacity. Three primary components make up the framework for SHRP 2's focus on capacity: (1) transportation is a system, (2) transportation's relationship to other systems, and (3) highway development.

SHRP 2 is managed by the Transportation Research Board on behalf of the National Research Council. Funding for the four year program has been authorized at \$205 million. For additional information on SHRP 2, visit the program's website at www.TRB.org/SHRP2.

Source: www.TRB.org/SHRP2

ODOT Announces 2008-2009 Business Plan

ODOT's Director, James Beasley, rolled out the 2008-2009 business plan for the department. The new plan outlines values and goals designed to promote safety, reduce congestion, encourage economic development, and advance a multi-modal approach to meeting Ohio's transportation needs. In alignment with Governor Strickland's Turnaround Ohio plan, Director Beasley has presented a new mission for ODOT and provided a direction that prepares the department to face the challenges of construction inflation, flat state revenues, uncertain federal investment, past program decisions, and constraints on major new construction.

The business plan outlines seven strategic initiatives:

- Strategic Initiative 1: Restore fiscal responsibility by adjusting ODOT's finances to address continued construction cost inflation, flat state revenues, and past program decisions; and adopt improved procedures to the Major New Construction program to match realistic trends in revenue and construction costs
- Strategic Initiative 2: Promote a comprehensive state and federal finance agenda, emphasizing cooperation instead of competition, to advance Governor Strickland's Turnaround Ohio transportation initiatives
- Strategic Initiative 3: In addition to our priorities of safety and congestion-reduction, broaden the criteria for project selection, especially in the category of Major New Construction, to include economic development, cost/benefit analysis, and opportunities for multi-modal integration and urban revitalization
- Strategic Initiative 4: Establish "Smart Growth" strategies to ensure ODOT projects take growth and local land use issues into account
- Strategic Initiative 5: Implement and advance cost-effective strategies for pavement preservation
- Strategic Initiative 6: Implement additional cost-effective strategies for traffic flow and traveler information
- Strategic Initiative 7: Embrace environmental stewardship by implementing internal strategies to promote clear air and energy independence

Over the next seven years, ODOT will work towards achieving seven key goals:

- Goal # 1 - Demanding fiscal responsibility, efficiency, and accountability
- Goal # 2 - Promoting opportunity and accountability
- Goal # 3 - Promoting "fix-it-first"
- Goal # 4 - Embracing multi-modal transportation planning
- Goal # 5 - Prioritizing safety in all transportation
- Goal # 6 - Work towards a "better than before" environmental policy
- Goal # 7 - Determining workforce assignments, classifications, and organizations

To learn more about ODOT's business plan or to download a copy, visit the department's website at <http://www.dot.state.oh.us/2008%2D2009BusinessPlan/>.



ODOT's Strategic Research Focus

ODOT is focusing its research efforts on five main areas: mobility, safety, renewal, economic development, and operations and business practices.

Mobility: Let's face it, no one likes to sit in traffic. ODOT is working on finding ways to better handle congestion and keep traffic moving. Through research projects like "Innovative Methods for Calculation of Freeway Travel Time" and "Freight Mobility, Access and Safety Strategies," ODOT is exploring multi-modal approaches to managing congestion.

Safety: Not only do we want to keep traffic moving, but we also want to do it safely. It doesn't matter how quickly you get to your destination if you don't arrive in one piece. Research projects like "Crash Base Rates for Intersections in Ohio" and "Demonstration of Innovative Techniques for Work Zone Safety Data Analysis" are helping ODOT understand the factors that cause accidents and develop ways to reduce them.



Renewal: Just as we age, so do our roads, bridges, overpasses, and underpasses. Our transportation system needs care and maintenance to keep it working. By doing research projects such as "Pavement Forecasting Models" and "Development of Degradation Rates for Various Ohio Bridge Types" ODOT is learning new ways to preserve the existing system while improving design and construction methods to build new roads and bridges faster that are also safer and longer-lasting.

Economic Development: Times are changing. Cities are growing; communities are popping up all over the place; and technology is advancing at a rate that could make your head spin. Believe it or not, this has an impact on our roads. Not only do these changes call for new approaches to planning, design, and financing, but they also carry with them new concerns for impacts on the environment. Doing research on topics such as alternative financing techniques, noise wall barriers and alternative fuels will help ODOT respond to our evolving society and keep Ohio economically competitive.

Operations & Business Practices: ODOT strives to be the best at what we do and we think we do a pretty good job. However, there will always be room for improvement. By utilizing research projects, such as "Benefit Cost Models to Support Pavement Management System Decisions," ODOT works towards improving our decision making processes and maximize the efficiency of our operations.

For more detailed information on ODOT's strategic research focus areas, download a copy of the 2007 Cooperative Research Seminar Report from <http://www.dot.state.oh.us/divplan/research/announcements/announcements.htm>.

Calendar of Events

January - 2008

January - Quarterly progress reports due for all active research projects

January 1 - New Year's Day - ODOT Closed

January 7 - ODOT R&D issues Fiscal Year 2009 RFP, OPREP 2009 RFP, and Call for Student Study Problem Statements

January 13-17 - Transportation Research Board Annual Meeting, Washington, DC - For more information visit: <http://www.trb.org/meeting/>

January 21 - Martin Luther King Day - ODOT Closed

February - 2008

February 18 - President's Day - ODOT Closed

March - 2008

March 3 - Deadline for submissions to FY2009 RFP, OPREP 2009, and Student Study Problem Statements - Receipt by 4:30 PM EST

March 25-27 - SCOR Meeting, Washington, DC - For more information contact Chris Jenks @ cjenks@nas.edu

April - 2008

April - Quarterly progress reports due for all active research projects

April 7-18 - Research Review Sessions @ ODOT - Schedule to be announced, check <http://www.dot.state.oh.us/divplan/research/announcements/announcements.htm> in March 2008

April 11-27 - International Scan

May - 2008

May 22-23 - Research Selection Committee meets to select researchers for FY2009, OPREP 2009, and Student Study problem statements

May 26 - Memorial Day - ODOT Closed

For information on TRB Sponsored Conferences and Workshops go to <http://trb.org/calendar>



Karen Pannell Leaves ODOT

After twenty-three years of service, Karen Pannell resigned her position at ODOT. Karen joined the Office of R&D in October 2001. Prior to that, she worked in the Office of Materials Management. Karen will now be focusing all of her efforts on her two children, Matthew (age 3) and Sarah (age 1), as she takes on the challenging role of full-time Mommy. We wish her the best in all of her future endeavors.

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