

Office of Research and Library Services Monthly Report

June 2007

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ORLS PROGRAM NEWS

ITS America Conference

Doug Brodin attended the ITS America conference June 4 to 6. The program included an update from senior officials on the federal ITS program and how it supports the National Congestion Initiative. Presentations on the Urban Partnership Agreement and the federal Vehicle Integration Initiative (VII) were informative. A VII Technology Showcase featured dozens of innovative mobility solutions. The opportunity to hear and see potential transportation technology solutions and network with other state DOT staff with research interests was also beneficial.

ARROWS Status

On June 25, Leni Oman and Doug Brodin met with representatives from Maintenance, Traffic and Ferries to discuss the future of ARROWS, a statewide computer-base weather information system developed and maintained by UW researchers for use by WSDOT maintenance personnel. The system also provides valuable traveler information on state highways and ferry routes available on WSDOT web pages. The ongoing cost of the system is about \$150K per year. The group decided to jointly fund another year of support and use that time to more fully explore future direction.

Truck Performance Measures Project

On June 22 Doug Brodin attended the kickoff meeting of the Technical Advisory Group (TAG) for the Truck Performance Measures project. This research is a line item in the Program T 2007-09 budget and TransNow (UW) is providing funding support as well. The objective is to develop a freight database to help guide investment decisions and

track project effectiveness. Barbara Ivanov is the project lead and Ed McCormack (UW) is the principal investigator. A project scope of work is being developed with work planned to begin as soon as possible.

Freight Working Group

On June 27 Doug Brodin attended a meeting of the re-formed Freight Working Group led by Barbara Ivanov. The initiative is to integrate freight services within WSDOT. Barbara and Scott Witt updated the group on the newly formed Freight Systems Division. The meeting focused on plans to integrate freight projects into the 2009-11 Highway System Plan. Quarterly meetings are planned to address freight issues of interest to WSDOT staff.

WASHTO-X Video Conference on Temperature Differentials Held

Kim Willoughby participated in a WASHTO-X video conference on Temperature Differentials on June 13th. The purpose of this meeting was to discuss WSDOT's use of a specification to determine temperature and density differentials and share our experiences with other states. The other states that were a part of this videoconference were: Texas, Alabama, Colorado, Arizona, California, North Dakota, Oregon, and Nevada. FHWA also participated in the videoconference.

National Center for Asphalt Technology (NCAT)

Kim Willoughby attended the National Center for Asphalt Technology (NCAT) Applications Steering Committee on June 26-27 in Auburn, Alabama. Presentations included test track findings and current research, tire/pavement noise studies, Warm Mix Asphalt, Foamed Asphalt, compaction study, and an update on the APTP (Airfield Asphalt Pavement Technology Program). If you would like to find out more about the work being done at NCAT, you can contact Kim at 360.705.7978 or willouk@wsdot.wa.gov.

Librarians in Training

Mike Wendt conducted 2 training sessions in Seattle for the Urban Corridors Office, accompanied by new WSDOT Librarian Kathy Szolomayer. Mike presented information on the Library web page and Google searching to 24 WSDOT employees, many of whom had questions about library services and resources. Kathy was glad for the opportunity to visit these offices, meet the staff, and spread the word about WSDOT Library service.

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LIBRARY ACTIVITIES

WSDOT Library brings it to your desktop

June saw the debut of a new format for the news clipping service coordinated by Reference Librarian Mike Wendt. In partnership with the Communications Department, the library now uses a service from a company called Vocus to collect and maintain news articles important to the agency. The service should reduce the amount of time spent gathering the news, ease retrieval of news at a later date, and allow the Communications department to analyze news coverage.

Regional Connections, and Beyond

Following in the footsteps of previous WSDOT Librarian Steve Cochran, and guided by Leni Oman, Director of the Office of Research and Library Services (ORLS), Kathy Szolomayer participated in her first teleconference meetings with the Western Transportation Knowledge Network (WTKN) and the Library Connectivity Pooled Fund (members from around the nation). Both groups (primarily transportation librarians, research and information professionals) seek to share information, resources and technical expertise to benefit their individual organizations (local, state and federal), as well as the larger transportation research community. Members from both groups welcomed Kathy to the transportation field and looked forward to her contributions to their efforts.

Reauthorization Website

Larry Ehl and Elissa Hicks from Governmental Relations met with Mike Wendt and Kathy Szolomayer to sketch the plans for a “one-stop” website providing information related to reauthorization of federal transportation legislation, coming up in 2009. Target audience for the site includes WSDOT staff, Governor’s office and the Legislature, local government officials and staff, and other stakeholders interested in transportation policy, development, funding, and environmental impacts.

Fiscal Frenzy

Ending the biennium on a positive note, Library staff worked with ORLS’s Sara Chittim, Fiscal Analyst and Tim Carlile, Business Manager, to make sure Library purchases and invoices were accounted for, accurate and complete. Some “wish list” items for the Library’s collection were purchased when available end of biennium funds were identified.

Library Usage

Circulation – Checked out 48 items to WSDOT employees.

Interlibrary Borrowing – Obtained 26 items on behalf of WSDOT employees.

Interlibrary Loans – Loaned 17 items to other libraries; unable to fill 2 requests (items in use or not found as cited).

Collection – Added 260 new items to WSDOT Library collection.

Library Cards – Issued 16 new library cards to WSDOT employees, renewed 4

Web Page (Month)

- Intranet Total Home Page Views: 709
- Intranet Total Page Views: 1433
- Average Daily Intranet Page Views: 46
- Popular Intranet Pages: Journals, Newspapers, Books, and Reports; Standards and Manuals; Find documents; Find websites: Find folios
- Internet Total Home Page Views: 1338
- Internet Total Page Views: 2405

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RESEARCH PROJECT NEWS

Eight new research project agreements were started this month

- T4118 Task Order 17 was begun for “Forest Products Use of Roadways and Transload Facilities in Washington.” It was initiated for \$12,000, to start 6-16-07, ending 8-31-07 with the University of Washington. Washington’s forest products sector has changed dramatically over the past several decades and with it the movement of timber and forest products. Estimates of current and projected future use by wood product manufacturers will allow the WSDOT to better plan its infrastructural needs to move products across the state efficiently.
- T4118 Task Order 18 was set up for the project “HOV 9”, for \$250,000. This is a Client Sponsored Research project, to be reimbursed by the Traffic Office.
- T4118 Task Order 19 was set up for “Flow Analysis and Advanced Technology Support.” This project is for \$420,000, and is a Client Sponsored Research project, also to be reimbursed by the Traffic Office.
- T4118 Task Order 20 was processed for TRAC-UW Support for the 2007-09 Biennium. It was set up for the next 24 months for \$328,000.
- T4120 Task Order 05 TRAC-WSU Support 2007-09 Biennium – set up for the next 24 months for \$90,000.
- T 4120 Task Order 21 was set up for “TSM Intern Contract” for \$389,568, beginning 7-1-07 and going through 6-30-09. This is a Client Sponsored Research project, to be reimbursed by the Northwest Region Traffic Office.
- GCA 5415 Interagency Agreement between WSDOT & Secretary of State, Washington State Library, for the 2007-09 Biennium to provide technical services support to the WSDOT branch library.
- T4120 Task Order 06 “Analyzing the Characteristics of Property Values to Improve Right of Way Acquisition Estimates” was set up for \$50,000. The contract runs from 7/1/07 until 6/30/08.

Thirteen project modifications were requested and approved

- T2695 Task Order 64 Modification 4 – Arterial Flow Methodology. This is a three month, no-cost time extension, in order to complete the draft research report and to make any review-comment changes. No additional funds are required to this \$184,000 UW project.
- T4118 Task Order 10, Modification 2 – Development of NWR TMC. This is a 12 month no-cost time extension, from June 30, 2007 to June 30, 2008. Additional time is needed because the work so far produced the scope of work and other documents that were used to procure the required consultant services. Additional time is needed to provide advice and expertise to the consultant for the duration of the consultant’s contract. No additional funds are required to this \$35,000 contract.

- T2696 Task Order 21, Modification 2 “Prioritization of Transportation Security Projects” with WSU was extended to 9-30-07 in order for WSDOT to review the draft final report and for the researchers to produce a final report. The reason for the delay includes change in student researchers, medical leave for P.I.'s, and change in WSDOT personnel on the project.
- T2695 Task Order 82 Modification 1 “Determination of Hydraulic Conditions and Eddy-Like Motions in the Culvert” received a time extension from 6-30-07 to 8-30-07. The cost stays at \$157,260. The extension is needed in order for WSDOT to review the final draft report and for the P.I. to prepare the final report, because the report could not be written until the thesis defense, which was scheduled for late May and resulted in significant comment on the research content. The P.I. and student are working through June to complete the draft final.
- T1242, Task Order 28 Modification 6 – Pavement Tools Consortium: A Pooled Fund Study TPF5 (090) was modified to increase the total funds by \$158,540 to \$668,540. The end date will be extended one year until June 30, 2008.
- T4118, Supplement No. 5 was processed to extend the end date of the Basis Agreement through June 30, 2009.
- T4118 Task Order 02 “Pavement Deterioration” was granted a no-cost time extension from June 30, 2007 until Dec. 31, 2007, because much of the recent study activity has focused on the triage rehabilitation planned for I-5 in King County starting in 2009. The focus of the work is shifting back to prediction of longer term pavement performance. Extra time is needed to complete this work.
- T2695 Task Order 81, Modification 1, A Statewide Operations Data Archive” was modified with a no-cost time extension, from June 30, 2007 until September 30, 2007 in order to complete the draft research report and make any review-comment changes.
- T4118, Task Order 08 “Bituminous Surface Treatment Protocol” was granted a no-cost time extension from June 30, 2007 till September 30, 2007 because a portion of the study is associated with rewriting the WSDOT Standard Specification (Section 5-02), which is still underway. Much of the study is complete.
- GCA1242, Supplement No. 5 was updated to extend the completion date with the UW from 6/30/07 to 6/30/09.
- T4120 Task Order 02, Support for Student Research Program (Student Studies) received a no cost 3 month time extension until 9/30/07 to allow time for completion of studies.
- T4120 Task Order 03 “Synthesis Development” received a no cost 3 month time extension until 9/30/07 to allow time for completion of synthesis development work currently in progress.

- Y 9976 AD Task Order 01 was processed for \$150,816 to research Infiltration on Steep Highway Slopes. The contract date remains the same, at 4-23-07 to 9-30-08.

Two New Research Reports Published

WA-RD 672.1 [ITS Evaluation Framework-Phase 2](#), University of Washington, June 2007, Pete Briglia, Jr., Jaime M. Kopf, and Mark E. Hallenbeck.

WA-RD 673.1 [Dynamic Pile Driving and Pile Driving Underwater Impulsive Sound](#) Battelle-Pacific Northwest Division, June 2007, Thomas J. Carlson, and Mark A. Weiland.

Five Research Reports Requested

The following research reports were requested from ORLS. Other reports are downloaded from the website or requested through the WSDOT Library or through other libraries that have added our reports to their collection.

Requested by private consultants and vendors

WA-RD 001.1 [Aerotriangulation Analysis & Control Point Error Detection Washington State Highways](#), Washington Department of Highways, March 1972, Cheng-yeh Hou.

WA-RD 126.1 [Changes in Intermodal Transportation in Washington and Impacts on Road Infrastructure](#), Washington State University, August 1987, Ken L. Casavant, Jonathan Newkirk, and Jerry C. Lenzi.

WA-RD 189.1 [Psychological Aspects of Mode Choice](#), University of Washington, December 1989, Cy Ulberg.

WA-RD 388.2 [Investigation of Culvert Hydraulics Related to Juvenile Fish Passage](#) Washington State University, January 1996, Michael E. Barber, and Randell Craig Downs.

WA-RD 417.1 [Noncontact Lap Splices in Bridge Column-Shaft Connections](#) Washington State University, July 1997, David I. McLean and Carol L. Smith.

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INFORMATION AND FINANCE RAC

Data Integration and Document Management Using Ontologies FY '07-'09 Research Project Cancelled

The *Data Integration and Document Management Using Ontologies* research project was cancelled as it is no longer needed. Much of the work was completed in house by Ron Cihon, Cartography and GIS Manager, and the WSDOT project Technical Monitor. This project was to determine if related applications of concepts can or should be used as a means to improve access to, understanding of, and management of disparate data stored in multiple systems throughout WSDOT. The project was originally proposed at \$110,000 and approved for funding in the FY '07-'09 Research Program at \$15,000. Professor Daniel Dailey of the Department of Electrical Engineering at the University of Washington had been selected as the principal investigator.

Performance Analysis and Forecasting for WSDOT Highway Projects Completed

The Final report, WA-RD 675.1 *Performance Analysis and Forecasting for WSDOT Highway Projects* was completed by the Principal Investigator, Dr. Ahmed M. Abdel Aziz, Assistant Professor, and the University Of Washington Department Of Construction Management. The research project will provide WSDOT a set of performance profiles (progress curves) as evaluated by the Research Committee to be considered for inclusion in the *WSDOT Construction Manual* and as a performance tool for inclusion in the department's *Prime Contractor's Performance Report*.

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OPERATIONS RAC

Research Office Equipment Purchase

The Research Office purchased a set of license plate readers and an infra-red portable traffic count and vehicle classification device (TIRTL) that can be assigned to research projects for use in data collection. The license plate readers can be used to obtain travel time information over a section of roadway. The TIRTL can count multiple lanes and classify vehicles in stop and go traffic. These devices will be housed at the Transportation Data Office but available for research use by WSDOT staff and university researchers through Doug Brodin.

Bridge Deck Shrinkage Cracking

A meeting between the technical monitors and principal investigators was held on June 20th to discuss and refine the scope of work for this research project. The focus will be on refining the current concrete mix design and examining construction practices to minimize or eliminate shrinkage cracking on bridge decks.

Pacific Northwest Snowfighters (TPF-5(035))

A PNS meeting was held in Couer d'Alene, Idaho on June 4-5. Tom Root, Monty Mills, Jim Andersen, and Jay Wells from the Maintenance Office and Kim Willoughby from the Research Office were in attendance. As a part of this meeting, a new research project was discussed (Longevity of Inhibitors and Deicer Performance) that will begin this winter. Partners in this research include Idaho, Montana, Minnesota, Oregon, Iowa, and Washington, so far.

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MULTIMODAL TRANSPORTATION RAC

Synthesis of Best Practices in Corridor Plans and Studies

Brian Smith, Director, Strategic Planning and Programming at WSDOT, requested a *Synthesis of Best Practices in Corridor Plans and Studies* including a search of TRB and other reports on corridor planning or corridor studies (state of practice, how to, what is in the good ones). The information will be used in updating the planning guidance manuals. The guidance in the literature and many of the plans described as best practices draw upon the philosophies and practices of smart growth, new urbanism, systems and technology, and context sensitive design. The focus is on major thoroughfares in urban environments where development intensity, mix of land uses and design features combine to create the opportunity for walking, transit and biking to be feasible

transportation choices. The project was completed on June 11, 2007.

Principal Investigator Selected for TDM Research

Request for qualifications (RFQ's) for Principal Investigators (PI's) were solicited for the research project, Measuring the Impact of Employer-based Transportation Demand Management (TDM) Strategies on Transportation System Performance. The research seeks to develop a process for estimating how a particular TDM strategy or mix of strategies affects the travel time, delay, and speed in specific corridors and the impact on corridor performance. RFQ's were received from four universities - the Center for Urban Transportation Research (CUTR) at the University of South Florida, the Alaska University Transportation Center (AUTC) at the University of Alaska Fairbanks, the Center for Urban/Transportation Studies at Portland State University, and the School of Economic Sciences at Washington State University. After review and scoring the RFQ's, Philip L. Winters, TDM Program Director at CUTR was selected as the PI. Brian Lagerberg and Ed Hillsman of the WSDOT Public Transportation and Commute Options Office will serve as Technical Monitors.

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PROJECT DELIVERY RAC

Association of General Contractors (AGC) Structures Group to Provide Advice on Pile Driving Research

A WSDOT technical team comprising staff from Washington State Ferries, the Environmental Services Office (ESO), and the Bridge Office decided to take the issue of pile driving noise impacts to a meeting of the AGC Structures Group in September for their advice on future research plans. This course of action followed the completion of the research project *Dynamic Pile Driving and Pile Driving Underwater Impulsive Sound (Carlson 2007)* which analyzed data from the Hood Canal Bridge and Friday Harbor terminal construction projects. This study concluded that most of the variability in impulsive sound during driving a pile can be accounted for by changes the impact hammer operator makes to overcome resistance to increases in pile depth. There is a potential research opportunity in the upcoming Vashon Island terminal construction project and the AGC Structures Group will be asked to help design a research plan for further testing and analysis to reduce pile driving acoustic impacts to fish and their behaviors.

Wildlife Collisions on State Highways to be Examined

University of Washington researchers met with WSDOT ESO Environmental Services staff to begin scoping a study that will examine the collision records of wildlife/vehicle accidents to identify priority locations for investing in future wildlife/safety improvements. The Washington Department of Fish and Wildlife is finishing a study examining the road kill data that WSDOT Region offices collect to ascertain if there are similarities in habitat features in locations where animals are found. The University research will compare this data to information that is reported from Washington State Patrol collision reports and identify areas on the state highway system where there is a high frequency of events and increase our understanding of the relationship of habitat to highway features (e.g. bridges, guardrails, etc.). The study will also produce GIS based maps so that target areas can be readily identified statewide. The research is scheduled to commence this summer and be completed by next spring.

UW Professor Yin Hai Wang is the Principal Investigator and Kelly McAllister, WSDOT Wildlife Biologist, is the Technical Monitor.

Steep Slopes Natural Dispersion and Infiltration Study for Western Washington

WSDOT is increasingly emphasizing the use of low impact development (LID) treatment practices for mitigating potential water quality impacts from highway runoff. LID measures focus on infiltrating water as close to the point of origin as possible to prevent it from concentrating in down-gradient areas and ultimately producing large quantities of surface runoff. This research will help WSDOT quantify infiltration rates that commonly occur in embankments and ditches located next to the highway in 3-5 locations in Western Washington. The study builds upon research conducted by the Washington State University (Reister and Fiedler 2006) which examined infiltration rates in Eastern Washington. Data that is collected from the study will be analyzed and modeled to improve the predictability of determining runoff volumes from highway embankments. Herrera Environmental Consultants is leading the study team that will collect data during the 2007-08 rainy seasons, with preliminary results scheduled for late spring 2008. WSDOT Technical Monitors are David Batts, Environmental Services Office and Rose Peralta, WSDOT Hydraulics.

Final Report of Project Scoping Practice in Washington State Completed

The Final Report of the *Project Scoping Practice in Washington State* was submitted by principal investigators Dr. Ken Casavant and Dr. Eric Jessup of the School of Economic Sciences at Washington State University in Pullman, Washington. Mark Gabel, Director, of the WSDOT Office of Cost Risk Assessment, is the project Technical Monitor. The goal of this pilot research is to describe the state of the art in program scoping in the United States, specifically identifying scoping methods that are accurate or within reason for the typical level of development and timely or in alignment with the legislative process for budget development.

Concrete Performance Using Low Degradation Aggregate

A meeting between the technical monitors and principal investigators was held on June 20th to discuss and refine the scope of work for this research project. The focus will be on designing a long-term testing protocol and performing baseline tests.

Quality Verification Method for Acceptance of Drilled Shafts

Two Requests for Qualifications were received for this project and have been reviewed by the technical monitor and research manager. A decision has been made to do a Request for Proposals to a wider audience to determine other technologies that may be available.

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