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## Technovations in Transportation

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### NIATT Advisory Board Dinner Held at Best Western University Inn

by Heloise Abtahi



Dr. Michael Kyte and Paul Olson

On Wednesday, April 29, 2015, NIATT welcomed members of the advisory board during a dinner held at the Best Western University Inn in Moscow. The dinner preceded the advisory board’s meeting to discuss the “New NIATT,” and included NIATT faculty members, staff, students, board members, and guests.

The evening began with a brief cocktail hour and continued into a buffet-style dinner. NIATT Director Ahmed Abdel-Rahim started things off during dinner by welcoming attendees and giving a brief overview of the goals and questions confronting the evolution of NIATT. Graduate student Brett Seely then presented his work on cybersecurity in traffic systems, followed by a brief presentation of honors.



Gary Duncan and Dr. Richard Wall



Dr. Jon Van Gerpen and Dr. Steve Beyerlein

Among those honored were Dr. Richard Wall and Dr. Jon Van Gerpen, who were recognized for Outstanding Collaborative Research and will be retiring in June. Dr. Michael Kyte, who was called the “father and grandfather to NIATT” at the ceremony and will be retiring in December, was honored for his service to and support of

NIATT throughout the years. Dr. Kyte has been involved with NIATT since 1991. Dr. Michael Dixon’s wife Cecily and daughter Julia were also in attendance. NIATT honored Dr. Dixon’s memory and recognized his exemplary dedication to NIATT with an Outstanding Contribution Award.

Presentations of current NIATT projects continued with Dr. Axel Krings and his student, Anup Chitrakar, who spoke about jamming-aware safety applications. The proceedings concluded with a brief turn to the Humanities as Psychology graduate student Jacob Rember spoke about human factors, experiment design, and his work on a project titled “Development of a Model of Passing Behavior on Two-Lane Rural Highways.”



Dr. Kyte, Cecily Dixon, Julia Dixon

## NIATT Advisory Board Meets in Moscow to Discuss the “New NIATT”

By Heloise Abtahi

On Thursday, April 30, 2015, the Best Western University Inn continued to play host to NIATT’s Advisory Board Meeting proceedings. The objective of the meeting was to work with the advisory board and get feedback on how to define a “New NIATT.” Throughout the day, advisory board members worked with NIATT’s Director, Ahmed Abdel-Rahim, faculty members, and moderator/discussion leader Paul Olson (FHWA-retired) to outline the objectives, challenges, and opportunities for the future of NIATT.

The group endeavored to produce a list of action items that would give NIATT a jumping-off point for developing the direction of the “New NIATT.” Advisory board members like Julia Kuhn (Kittelson & Associates, Inc.), a former UI undergraduate student, encouraged NIATT to find out what faculty are passionate about and work on changes from there. Greg Davis (Kettering University) noted that NIATT is at a crossroads, ready to evolve and respond to the needs of the academic and professional community. Many board members, including Tom LaPointe (Valley Transit-retired), spoke to NIATT’s importance to the state of Idaho and discussed how NIATT could develop its already exemplary work with the state of Idaho and Idaho Transportation Department.

Toward the end of the day, the group met with UI’s Dean of Engineering, Dr. Larry Stauffer, who provided perspective on the role of NIATT at the college- and university-wide levels. The Dean and board members discussed the important role of students in NIATT’s work and the College of Engineering. Board members encouraged increasing outreach efforts and noted the importance of NIATT’s work in showing students the opportunities a degree in engineering can offer, especially with new incoming faculty.

The day drew to a promising close as the group established an order of importance for action items and discussed the upcoming 25<sup>th</sup> anniversary celebration. A general timeline was also put in place with the hope that by the time NIATT celebrates its 25<sup>th</sup> birthday, a “New NIATT” would be ready to be unveiled.

## Faculty at a Glance

by Heloise Abtahi



### **Brian Dyre, Associate Professor, Department of Psychology & Communication Studies, College of Letters, Arts & Social Sciences**

Dr. Brian Dyre has been with the University of Idaho since 1995. He has been working with NIATT from the Department of Psychology & Communication Studies for about three and a half years. Currently, he is working on two ongoing projects with NIATT, one for ITD (Idaho Transportation Department) looking at highway striping and sizing, and one project in conjunction with PacTrans and the Alaska Transportation Department

looking at two-lane passing zones in rural areas.

Dr. Dyre himself has worked on interdisciplinary projects before working with NIATT, and he currently works with the Department of Psychology's "Human Factors" graduate program, an interdisciplinary field which works with engineering, psychology, and physiology—the human/machine interface. One important tool Dr. Dyre uses for this work is the driving simulator, a machine that simulates the experience of driving down a road in a car. This simulator provides a good deal of useful data, Dr. Dyre says, because it lacks the potential for confounds (unpredictable variables) in an experiment. Dr. Dyre noted NIATT's—and the University of Idaho's in general—recognition of the importance of human factors in their projects and overall support and encouragement.

When it comes to working with students from multiple disciplines, Dr. Dyre noted the importance of maintaining openness: "We've had teams of students both in Civil Engineering and Psychology working on these, so I'm very open to having students from Civil Engineering come and work in my laboratory even though it's a psychology laboratory...as long as you have an interest in surface transportation and highway safety, there's room for you."

You can find more about Dr. Dyre at <http://www.uidaho.edu/class/psychcomm/briandyre>.



### **Dave N. McIlroy, Professor, Department of Physics, College of Science**

Dr. Dave McIlroy has been with the University of Idaho since 1996 and has worked on and off with NIATT since 2000. Dr. McIlroy first worked on a NIATT project looking at water injection systems with Dr. Steve Beyerlein. He's also worked with Dr. Judi Steciak on ignition systems and Dr. Armando McDonald on biocatalysis and biomaterial/biomass conversion via the use of nanocatalysts.

Dr. McIlroy works on many projects that demand interdisciplinary work, and he sees this as a necessary feature of modern scientific research. For NIATT, he says his knowledge base in physics provides an extra dimension to many different projects, especially those requiring the development of advanced materials. Dr. McIlroy's research in nanomaterials and nanostructures makes him indispensable for projects in need of materials that go beyond the organically available. Whether it's converting biomass into fuel using a nanocatalyst or helmet reinforcement, a physicist is a welcome addition to a research team.

When it comes to his work with students, Dr. McIlroy puts a great deal of emphasis on gaining practical, hands-on experience in a lab. NIATT, he says, is an excellent vehicle (pun-intended) for students of a great variety of disciplines to gain that experience. Dr. McIlroy noted in particular the excellent opportunity that NIATT projects present for "cross-pollination" to students outside of the

Engineering program, who are able to work with a diverse team and gain practical work experience they might not have found otherwise. As a result of their work with NIATT, many undergraduate students have gone on to graduate programs, and Dr. McIlroy has even known a few students who have gone on to double majors in (Applied) Physics and Engineering.

You can find more about Dr. McIlroy at

<http://www.uidaho.edu/sci/physics/faculty/davidmcilroy>.

## NIATT Students Present at UI's Engineering Design Expo

NIATT faculty and students participated in several activities in the 2015 College of Engineering Design Expo. The Expo events took place on May 1<sup>st</sup> at the Bruce Pitman Center on UI's campus, and allowed students a valuable opportunity to showcase their senior design projects and interact with faculty, industry professionals, and potential future Vandals.



NIATT student Riannon Zender at UI's Engineering Design Expo 2015

In an effort to excite and inform young EXPO attendees about transportation engineering, NIATT graduate student Riannon Zender (pictured left) demonstrated traffic signal controller operations for more than 600 high school and middle school students who attended the design expo. She detailed the workings of a traffic control cabinet, presented examples of 3D simulation models, and spoke about unique transportation projects like the Tilikum Crossing in Portland, OR (a transit and pedestrian-only bridge opening Sept. 2015). "Because of the nature of our capstone projects, civil engineering students are usually only able to present our projects through

posters at EXPO. This was an opportunity to provide future engineers with tangible examples of why the field of transportation is so exciting," Zender said.

The UI Clean Snowmobile Team (pictured right) also won an award for Excellence in Technical Presentation.

In addition, several transportation engineering capstone design projects were also presented at the expo. Kevin McGarry and

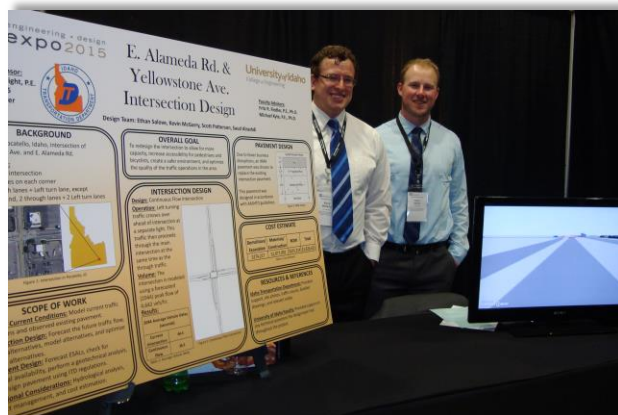


(Part of the 2015 UI Clean Snowmobile Team – Meghan Hester, Jason Maas, Crystal Green, Cade Smith, and Zach Lipple – showcasing the sled.

Ethan Salove

used microscopic simulation animation to demonstrate the effectiveness of different intersection design alternatives.

More information on the College of Engineering's Design Expo can be found at <http://www.uidaho.edu/engr/expo>.



Pictured are Civil Engineering student's Kevin McGarry and Ethan Salove.

# Featured Project: “Evaluation of Fiber-Reinforced Asphalt Pavements – Phase 1”

by Heloise Abtahi

Researchers at University of Idaho and Washington State University are currently working with Idaho Transportation Department (ITD) on a project that will evaluate the performance of three different asphalt-reinforcing fibers for a 3.22 mile long stretch of pavement in Southeast Idaho. Using fibers supplied by Forta Co., Nycon Corporation, and Surface-Tech, Inc., ITD has built four different sections (three with fibers and one control section) on US-30, just east of Montpelier, Idaho. The stretch of highway being used was selected by ITD due to the rutting and cracking that occurs in the pavement, as well as the heavy truck traffic that frequents the road. The hope is that the use of fibers will help alleviate the



Graduate student Ahmed Muftah checks the mix temperature during construction of the fiber project on US-30

problems with this and other similarly stressed roadways, making them safer and reducing maintenance cost.



Process of injecting fibers into the mix via the Recycled Asphalt Pavement (RAP) inlet of the drum dryer in the asphalt plant

The project, lead by principal investigator Dr. Fouad Bayomy, is currently about halfway through it's first phase. This part of the project, which will continue through the end of 2015, is comprised of a literature review and a laboratory analysis of the different mixes being used. Phase 2 will then analyze and report on the performance of the mixes in the field. Analyzing the fibers in the lab and in the field is a necessary component of the evaluation process, and the project will also be collecting and reporting data from the construction process. Nearly one thousand pounds of plant mix were collected from the test sections for laboratory testing. Dr. Bayomy is working with Dr. Haifang Wen at WSU on the project.

Graduate students from both UI and WSU are working on the project. UI student Ahmed Muftah works on the lab testing and will also work on model development for the Fiber-HMA mixes as part of his PhD research. Amir Bahadori, a graduate student at WSU, is also working on lab testing, which Dr. Bayomy says will include X-ray tomography. This type of testing will help to evaluate the level of fiber dispersion in the mix. Dr. Bayomy and his team will also be using AASHTOWare ME Pavement design software for performance evaluation, which will allow for an excellent opportunity to check and calibrate the software using data from a road that was recorded from the time it was built forward.

## University of Idaho

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