PROGRAM PROGESS PERFORMANCE REPORT FOR UNIVERSITY TRANSPORTATION CENTERS

Submitted to: US Department of Transportation,
Research and Innovative Technology Administration

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Project Title: Safety Research Using Simulation (SAFER-SIM)

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Submitting Official: Same as Project Director

DUNS and EIN Nos.: UI DUNS 062761671; EIN 42-6004813

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Recipient Organization: The University of Iowa
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Recipient Identifying Grant Program No.: 15311500

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Report Term or Frequency: Semi-annual

Signature of Submitting Official: 

Overview

The SAFER-SIM in its first eighteen months has funded 25 research and educational projects, and has engaged in many education and outreach activities. In addition to the projects included in the initial grant proposal, two rounds of competitive research and educational proposals have been received and selected for funding; 11 in the first round and 14 in the second. In November of 2014, Dawn Marshall was approved to take over the role of center director at the University of Iowa. The transition was smooth and created no disruptions or loss in momentum in center activities. An advisory board meeting was held in November 2014. Board members were updated on the range of SAFER-SIM projects, SAFER-SIMposium plans, and were asked for input on the student award nominees. Two student awards were presented, one to at the Ph.D. level that was also submitted for recognition at the annual CUTC awards banquet and one at the Masters level. We held our second SAFER-SIMposium hosted by the University of Puerto Rico. The SAFER-SIMposium brought together local traffic safety professionals, faculty and students from all the consortium schools for a research and technology exchange. A third SAFER-SIMposium is planned in conjunction with the Road Safety Simulation conference in Orlando, Florida in October 2015. We also participated in several outreach events including STEM tours, K-12 curriculum development, and college course curriculum development related to road safety. The relationships built since SAFER-SIM began with educators and STEM initiatives are a foundation for our expanding education and outreach activities. A copy of this report can be found on the SAFER-SIM website under the "Reports" tab (http://safersim.nads-sc.uiowa.edu/reports.php).

1. Accomplishments

a. Goals and objectives of the program

The goal of the SAFER-SIM UTC is to use simulation techniques to address the safety issues prioritized by the US DOT. Specifically, our center has identified seven areas of activity:

1. **Conduct safety research using simulation techniques.** Progress continues on the initial collaborative projects from the original grant proposal. Final reports on the results of these projects will be made available to the public on the SaferSim website as they conclude in 2015. Projects selected by SAFER-SIM Associate Directors during the first proposal competition in the spring of 2014 for funding with FY13 money also continue to progress. Thirty proposals submitted to a second competition for projects to be funded with FY2014 money were reviewed in October 2014. Principal investigators of selected projects were notified in November 2014. This competition invited proposals for large collaborative multi-institution projects as well as individual institution projects. As in the first competition, proposers submitted a two-page project description. All of the SAFER-SIM Associate Directors reviewed these and provided comments and rankings. Projects from this second competition have start dates of January or July 2015.

   In addition to the 14 graduate and 8 undergraduate students supported by projects funding with FY13 money, 7 undergraduate students and 17 graduate students supported by SaferSim projects funded with FY14 money and an additional 9 graduate students are involved as part of a course, as shown in Table 1. Faculty and students from Engineering, Public Health, Psychology, Computer Science, Emergency Medicine, and Science Education

are participating in these projects. Abstracts for all funded projects can be found on the SaferSim website under the "Research" tab (http://safersim.nads-sc.uiowa.edu/research.php).

Table 1. Research projects selected for funding with FY14 money.

Project Title	Project Type	Institution (s)	PI Co-PI	PI Departments	# of Grad Students	# of Undergrad Students
Identifying Postural Control and Thresholds of Instability Utilizing a Motion-Based ATV Simulator						
	Individual	U of Iowa	C. Jennissen S. Rahmatalla	Emer. Med. Civil Eng.	1	0
Transfer from Highly Automated to Manual Control Performance Trust						
	Individual	U of Iowa	T. Brown C. Schwarz	NADS NADS	1	0
Using Driver Simulators to Assess Instructional Format Efficacy on Older and Younger Drivers' Understanding of Adaptive Cruise Control						
	Individual	U of Iowa	B. DeVane J. Moore	Educ. Psych. Psych. & Quant Foundations	2	1
Exploring the Science of Driving (Education)						
	Individual	U of Iowa	L. Flynn T. Brown	Science Ed. NADS	9 Part of course	1
Using Naturalistic Driving Data to Develop Simulator Scenarios						
	Collaborative	U of Iowa U of Wisc.	J. Gaspar D. Noyce	NADS Civil Eng.	1	2
Neural Correlates of Older Driver Performance						
	Individual	U of Wisc.	D. Noyce M. Chitturi	Civil Eng. Civil Eng.	2	0
Driving Simulator Evaluation of Countermeasures to Improve Pedestrian and Bicycle Safety						
	Individual	U of Wisc.	D. Noyce	Civil Eng.	2	0
An Investigation of Peer Influences on Risky Child and Adolescent Pedestrian Road Crossing						
	Collaborative	U of Iowa U of Cen. FL	J. Plumert J. Kearney P. Hancock	Psychology Comp. Science Ind. Eng.	2	0
Utilizing Micro Simulation to Evaluate the Safety and Efficiency of the Expressway System						
	Individual	U of Cen. FL	M. Abdel-Aty	Civil Eng.	1	1
Phase II: Operational and Safety-Based Analyses of Varied Toll Lane Configurations						

	Collaborative	U P. R. U Mass U of Cen. FL	Didier Valdes Mike Knodler M. Abdel-Aty	Civil Eng. Civil Eng. Civil Eng.	1	0
The Impact of Vehicle Automation on the Safety of Vulnerable Road Users (Pedestrians and Bicyclists)						
	Individual	U Mass	S. Samuel D. Fisher	Ind. Eng. Ind. Eng	1	1
Analysis of Driver Behavior and Operations Intersection Short Lanes						
	Individual	U Mass	M. Knodler E. Christofa	Civil Eng. Civil Eng.	1	1
Visually Impaired Pedestrian Safety at Roundabout and Midblock Crossings						
	Individual	U Mass	E. Christofa A. Ganz	Civil Eng. Elec. Eng.	1	0
A Driving Simulator Evaluation of Cross-Sectional Design Elements and the Resulting Driver Behaviors						
	Individual	U Mass	M. Knodler E. Christofa	Civil Eng. Civil Eng.	1	0

2. **Leadership Development.** The second SAFER-SIMposium was hosted by the **University of Puerto Rico** February 25-27, 2015. Over 30 people attended this three day event including the five associate directors, 4 faculty, 21 students involved in SAFER-SIM projects and several Puerto Rican government representatives and traffic safety professionals. Students supported by our center gave presentations on their research and technical development activities associated with SAFER-SIM projects. A tour of a managed lane facility also provided students with the opportunity to interact with traffic safety professionals engaged in work directly related to several SAFER-SIM projects. An extensive proceedings for the event will be available on the SAFER-SIM website. In addition to the presentations, social and networking time during the event supported spontaneous conversations and collaborations among the students centered on their work as safety professionals. A student said:
   "This opportunity is unique in that I got to meet a network of future colleagues, learn about their interests, and how we can collaborate in the future to solve problems both in the mainland U.S. and Puerto Rico." – **Radhameris Gómez**

Figure 1 Attendees of SAFER-SIMposium in Puerto Rico

SAFER-SIM associate directors and faculty presented overviews of each site providing student and professional attendees with an understanding of the variety of facilities and range of applications of simulation across our center. Attendees also had the opportunity to drive the University of Puerto Rico's driving simulator and discuss with the student technicians the challenges associated with building and getting it ready for operation.

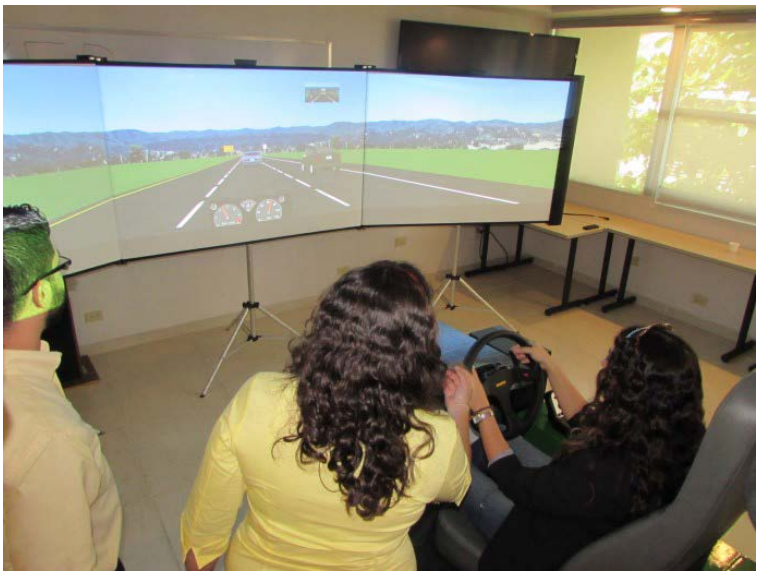


Figure 2 Test driving the University of Puerto Rico driving simulator

A technical field trip to the Dynamic Toll Lane facility (DTL) and Operations Control Center (OCC) on PR-22 attendees were presented with:

- Characteristics of PR-22 DTL/BRT lane
- Real time activities at the DTL Operations Control Center

- Long-term plans for managed and toll lanes
- Firsthand experience of driver behavior in the toll lane

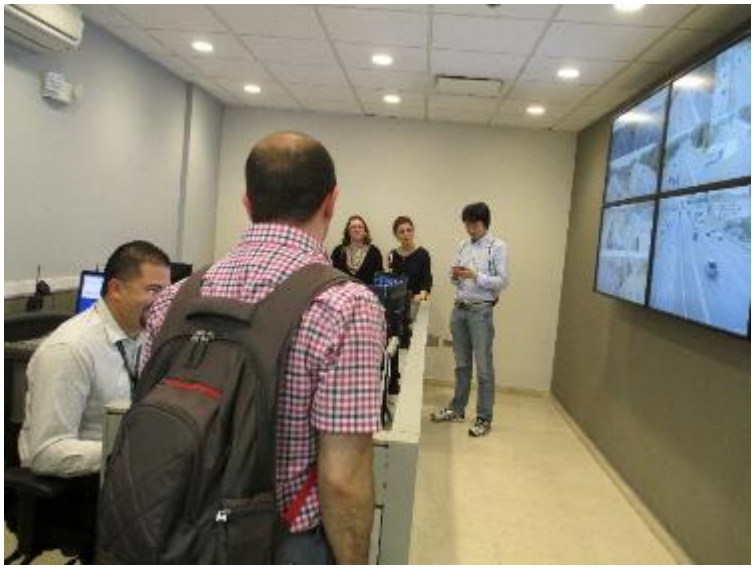


Figure 3 Tour of dynamic toll lane facility

Student presentations of their work on SAFER-SIM supported projects filled an entire day of the event. Eighteen presentations covered experimental plans, technical development and research results from a majority of currently active SAFER-SIM projects. Students provided the majority of questions and comments on each presentation illustrating the success of the event in supporting leadership and professional development, and professional networking among the students.

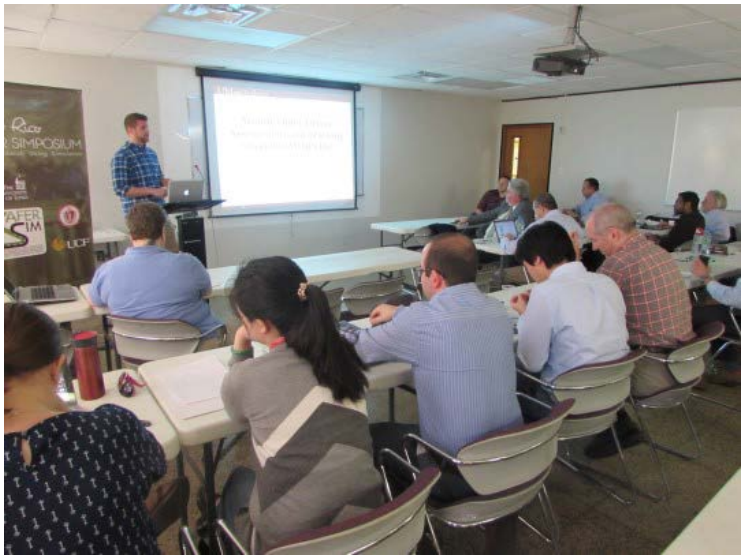
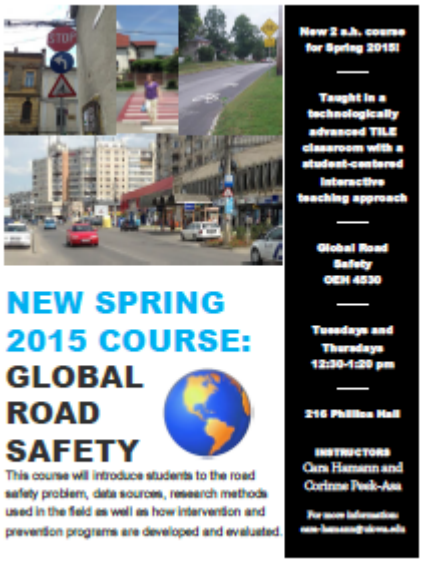


Figure 4 Student presentation by Craig Schneider

Two students were presented with awards one at the Ph.D. level, Kelvin Santiago, and one at the Master's level, Juan Rivera Melendez. These two very qualified candidates have made tremendous contributions to the SAFER-SIM UTC and to safety research using simulators. Both have been instrumental in SAFER-SIM research projects, in promoting collaboration, and in advancing safety using simulation. Kelvin Santiago, nominated by the **University of Wisconsin**, has over eight academic journal publications and twenty conference presentations associated with various projects over his academic career. Mr. Santiago was also nominated for recognition during Council of University Transportation Centers awards banquet held in conjunction with the Transportation Research Board annual meeting in January 2015. Juan Rivera Melendez, nominated by the **University of Massachusetts**, has played an extensive role in building new virtual worlds to support driving simulation projects. Mr. Melendez has focused on issues of efficiency and safety set forth as priorities by U.S. Transportation Secretary Anthony Fox.

3. **Education and Workforce Development.** The SAFER-SIM consortium members organized and participated in several education events and made plans for future collaborative efforts in education and workforce development.

Drs. Cara Hamman and Corinne Peek-Asa at the **University of Iowa** developed a new course "Global Road Safety". The goals of the course were to develop curricula to train undergraduate and graduate students in the area of simulation research via a new Global Road Safety course. The course trains undergraduate and graduate students on the field of simulation research and how to develop scenarios, including lecture, hands-on activities, and a field trip to see the simulator in operation. A curricular module on simulation research and scenario development has been created and a homework assignment on defining scenarios was created. 10 students are currently enrolled in the course (Spring 2015) and have been trained using this module and homework assignment, which included a lecture, hands-on scenario diagramming, and a field trip to the HANK Virtual Environments pedestrian and bicycle simulator lab.

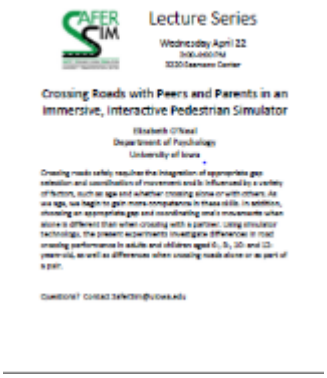


"Exploring the Science of Driving" at the **University of Iowa** is developing a driving-based curriculum for STEM education in middle and high schools that can be used by teachers in their classroom. This is augmented by a "teach the teacher" program where teachers will be brought in to learn the curriculum material so that it can be implemented in their class which expands

the reach of the program 20+ fold over a summer academy. It will increase interest in transportation projects by K-12 students who receive the curriculum. Student teachers involved in curriculum development have a new excitement for transportation that they can take to the classroom. Teachers who participate in the summer program will have an increased appreciation for the transportation field that they can share with their students. The curriculum will be available for others to use in their schools once completed. Students will use a portable driving simulator in their school to collect driving performance data then analysis that data to explore STEM concepts. Data sets will also be available. A highly portable desktop MiniSim driving simulator will be available for loan to teachers wishing to utilize this curriculum.

The same simulator will available for a Texting-and-Driving demonstration on the effects of distraction while driving. The University of Iowa (UI) collaborated with the Midwest Transportation Center regional UTC at Iowa State University (ISU) in developing a mobile driving simulator demonstration of distracted driving for teenagers. The initial phase of the demonstration includes a short drive where students will be asked to read a text message during the drive. The simulator then displays driving performance measures while distracted compared to non-distracted. This scenario is also installed on a ¼-cab MiniSim owned by Iowa State University that exists in a trailer allowing portability. The texting and driving demo will be presented at three events geared toward teen drivers; in Des Moines, Iowa, West Liberty, Iowa and the other in West Burlington, Iowa. This geographic area ranges from the center of the state to the eastern border. The desktop simulator will be available for future safety related events, middle schools, and high schools in Iowa.

4. **Technology Transfer.** The SaferSim lecture series continues to connect researchers and provide a venue for sharing work supporting a collaborative atmosphere. Elizabeth O'Neal, a graduate student in the UI Department of Psychology, will present a lecture on Crossing Roads with Peers and Parents in an Immersive, Interactive Pedestrian Simulator in April 2015. Summer and fall lecture topics include:


Lecture Series

Crossing Roads with Peers and Parents in an Immersive, Interactive Pedestrian Simulator

- Detecting Impaired Driving
- Teach-the-Teacher Exploring Physics through Driving
- Bicycle-Vehicle Interactions
- Simulator Scenarios from Naturalistic Data
- Exploring Automated Vehicles through Simulation

Lectures are planned to occur approximately once a month throughout 2015. Videos of the lectures are available on our website shortly after each date.

The SaferSim website is currently undergoing a re-organization. The work behind the scenes has started with our current undergraduate student, Adrienne McKee. Adrienne is graduating in May and we thank her for her work in getting the SAFER-SIM website up and running and her insights on how we can make it better. An undergraduate student will be hired over the summer to continue the updates and re-organization of the website and will be supported by NADS Systems Administrator and web programmer, Stephen Cable.

The updates to the website include a new tab title “Resources” to support all users and potential users of simulators; students, faculty, transportation professionals. Information on the uses of simulation and how to use simulators will be added. There are valuable existing materials, such as the Driving Simulation Handbook. In addition, SAFER-SIM will create instructional videos aimed at students and professionals to help them use and understand simulation as a tool. The Research tab will be re-organized to make finding individual projects easier and links to project reports, conference presentations and journal articles will be added to both the “Research” and “Reports” tab. This will allow visitors to the website to easily find information about on-going projects and quickly locate reports, papers and presentations supporting the transfer of technology and information. The news feature will be redesigned to indicate the most recent updates to the website allowing visitors to easily and quickly see the range of educational and professional activities engaged in by SAFER-SIM members as they happen.

SAFER-SIM projects have already resulted in several journal articles and conference presentations.

University of Central Florida	3 journal papers under review 3 presentations at TRB 4 presentations SAFER-SIMposium Puerto Rico
University of Iowa	1 conference paper 1 Lecture series presentation 3 presentations SAFER-SIMposium Puerto Rico
University of Massachusetts	2 journal papers in development 9 presentations SAFER-SIMposium Puerto Rico
University of Wisconsin	2 conference papers with journal potential

Drs. Chris Schwarz and Tim Brown, and Dawn Marshall from the **University of Iowa** have been participating in STEM Innovator Community Partnership meetings and events. The meetings have brought together professionals from various technology fields and educators to network, workshop and understand the educational needs of businesses in STEM related fields. Through these activities better curricula can be developed and summer workshop and internship programs for students can be designed to better prepare students for careers in STEM related fields. The STEM events through Workplace Learning Connection (www.workplace-learning.org) reach K-12 students through day-long learning institutes where students participate in short workshops with professionals in STEM fields. Tours for high school students of various facilities also highlight STEM related career paths. In the first quarter of 2015, NADS at the UI has hosted two tours for students and one for the University of Iowa Admissions Office Advisory Board consisting of 12 high school counselors from the state of Iowa.

5. **Collaboration.** Collaborative projects continue with the second year of SAFER-SIM. Three new collaborative projects were funded with FY14 money, one of which involves researchers from three SAFER-SIM sites; University of Central Florida, University of Massachusetts, and University of Puerto Rico. **University of Wisconsin** students Kelvin Santiago visited the University of Iowa to connect with collaborators on two on-going projects working to bring road data from SHRP-2 naturalistic driving data into simulator environments. These projects are particularly exciting

because they will allow collaboration among users of different simulator technologies and between roadway engineers and researchers through the development of a software tool to automate simulator road definition using data obtained from an AutoCAD drawing. Meetings to work on several collaborative projects were planned during the SAFER-SIMposium in Puerto Rico. In addition to regular web conferencing, teleconferences, and email communications, the face to face interactions through site visits time set aside during the symposia greatly enhance collaboration.

6. **Program Efficacy.** The activities of the SAFER-SIM UTC are advancing traffic safety through the use of simulation and developments in simulation. With 41 proposals for education and research projects have been received in response to our two calls for proposals resulting in 24 funded projects. These projects promise significant advancements in safety for all roadway users as well as developments in simulator technology that will allow easier collaboration among users of different driving simulator platforms as well as using engineering CAD drawings and naturalistic driving data to create simulation environments. Techniques developed can be used to advance the study of existing and proposed infrastructure using the driving simulator and will impact other disciplines through the visualization of data and in-vehicle systems design. These advances start to dissolve the barriers to collaboration between professional in various transportation safety fields. Still other projects, explore ways to improve safety for vulnerable road users and create better design standards for roads and facilities. In addition, these projects all provide students with hands-on experience.

   The journal articles and conference papers coming from SAFER-SIM projects will provide resources for traffic safety professionals and researchers. The redesign of the SAFER-SIM website will also provide easier access to resources both produced by SAFER-SIM activities and existing expertise in the field of simulation. Some of the requested changes came directly from transportation professionals, illustrating that they will access resources provided in this manner.

   SAFER-SIM is continuing to build relationships with STEM and workforce development organizations as well as develop educational materials and demonstrations that will be available to hundreds of students in 2015. These relationships will support collaborations with educators at the Kirkwood Community College Regional Center at the University of Iowa. This facility will open for fall of 2015 next door to NADS (http://www.kirkwood.edu/johnsonregional). Offerings will include high school academies, continuing education, liberal arts and science transfer courses.

   The center continues to hold regular teleconferences among the consortium members to share information, track progress on collaborative research projects, share outreach ideas, and plan future activities. These regular phone calls have proven to help preserve the collaborative nature of our center. The bi-weekly digest of news items related to safety and simulation is distributed via email to over 200 people. The newsletter has provided subscribers with links to 11 abstracts, 17 conferences and events and 42 reports and has featured 13 labs involved in simulation research.

   An Advisory board meeting was held in November of 2014. The Advisory Board consists of eight individuals from academia, business, federal and state government with involvement and

expertise in transportation safety. A list members can be found in Appendix A. The agenda for the meeting included:

- Year 1 Program Highlights
    - Initial projects identified in original grant proposal and from RFP Round 1 (see next page)
    - RFP2 proposals received
    - K12 STEM Outreach Events
    - SaferSimposium #1
- Discussion of New and Continuing Collaborative projects
    - Operation and Safety-Based Analyses of Varied Toll Lane Configurations; UCF-UMass-Amherst + University of Puerto Rico – Mayaguez
    - Using Naturalistic Driving Data to Develop Simulator Scenarios; UI + UW-Madison
    - Bicycle Infrastructure; UMass-Amherst; UW-Madison; UI
- Plans for Road Safety and Simulation Conference, Orlando October 2015
- Student of the Year nominations. Our Center has chosen to present two awards (one Master's and one PhD), but the overall UTC program only allows us to forward one nominee to be considered for overall UTC Student of the Year. We would like your input on which of our two award winners to forward for the national competition.
- Transition Plan for Directorship
- New Business

Dawn Marshall attended the Council of University Transportation Center meetings at TRB. Through these meetings connections were made with other UTC directors and administrators. Dr. David Noyce represented SAFER-SIM at the UTC Safety Summit in Pittsburgh, PA in March of 2015. There Dr. Noyce gave a presentation on SAFER-SIM activities, interacted with directors of other UTCs and received feedback on SAFTER-SIM activities. Dawn Marshall and Kathy Holeton will attend the CUTC summer meeting in June 2015.

Dr. Mohamed Abdel-Aty of **University of Central Florida** was presented with the 2015 Pegasus Professor Award for at least five years of service and noteworthy research and creative activity of national and international impact (http://today.ucf.edu/pegasus-professors-honored-founders-day-celebration/).

7. **Diversity.** SaferSim Research projects are providing funding for several students from minority groups. Additionally, SAFER-SIM is working with organizers to support the Women in Construction Workshop. The workshop's objective is to reach out to talented female graduate students who plan to stay in their home countries upon graduation to contribute to the education and training of future generations of female students. SAFER-SIM is also proud of the diversity of the professional backgrounds of individuals involved; Engineering, Public Health, Psychology, Computer Science, Emergency Medicine, and Science Education.

Plan for Next Reporting Period

As projects funded by the center begin to report results, the next reporting period will bring more activity in dissemination of information and technology transfer. The relationships that have been built will also produce more activity in education and outreach. Planned activities are:

- Third SAFER-SIMposium to be held in conjunction with the Road Safety and Simulation conference in Orlando, Florida in October
- Determining the site and data for the fourth SAFER-SIMposium
- Launch of the Texting & Driving demonstration on the portable simulator
- Launch of the Exploring the Science of Driving curriculum
- Redesign of the SAFER-SIM website to better support technology transfer
- Reports from completed projects will become available on the SAFER-SIM website
- How to use simulation videos aimed at students and professionals
- The SaferSim lecture series will continue with videos available on our website
- Continued participation in STEM outreach and educational events
- Planning for project selection for FY15 funding
- Look into the reactivation of the Driving Wiki or transfer of content to the SAFER-SIM website
- CUTC Summer meeting June 2015

b. Products

The SaferSim News Digest is available by subscription at our website. This email digest gathers news stories, program announcements, and conference information from around the world in the areas of safety and simulation. (http://safersim.nads-sc.uiowa.edu/) The website also hosts videos from the SaferSim lecture series. Development of the Global Road Safety course curriculum.

Within the next reporting cycle the Exploring the Science of Driving curriculum will be available to the public, videos about how to use driving simulators will be available, and the Texting & Driving demonstration will be available to schools and other organizations.

c. Participants & collaborating organizations

The University of Iowa (UI) collaborated with the Midwest Transportation Center regional UTC at Iowa State University (ISU) in developing a mobile driving simulator demonstration for teenagers. This demonstration will be available using a portable driving simulator beginning in April 2015.

Significant collaboration is taking place across departments and institutions within SAFER-SIM and with other partners. One excellent example is the **University of Wisconsin- Madison** where partners and collaborators have included Puerto Rico ITE chapter, UW-Madison ITE Chapter, UW Medical School, Madison Media Institute, ITS Wisconsin, Wisconsin Department of Transportation and individuals from various departs; Radiology, Kinesiology, Alzheimer's Disease Research Center, and University of Wisconsin-Milwaukee. **University of Massachusetts** also partnered with New England Section of ITE to host the NEITE Student Symposium on March 26th.

d. Impact

Establishment of a "Resources" tab on the SAFER-SIM website will provide both researchers and practitioners with reference material to understand the how simulation technology can be

employed to enhance safety. The re-establishment of the DrivingWiki site will enable shared access to technical simulation information worldwide.

The development and implementation of two curricula using simulation; Global Road Safety and Exploring the Science of driving will impact the development of the transportation workforce by increasing student knowledge and training in these areas and also introducing them to the field, which may lead some to continue their training and pursuit of careers in transportation safety. During the next reporting period we will be able to evaluate the impact of the Global Road Safety simulation curricula module via student performance on the homework assignment, final course grades, and feedback from the final course evaluations. The impact of Exploring the Science of Driving will be evaluated through feedback from experienced science teachers.

e. Changes/Problems

Dr. Susan Chrysler's departure from the University of Iowa necessitated a change in the role of director. On November 18, 2014, Dawn Marshall was approved as her replacement. Prior to Dr. Chrysler's departure, significant collaboration took place allowing Ms. Marshall to step into the role of director at the University of Iowa without disruption or delay in on-going or planned SAFER-SIM activities. A description of Ms. Marshall's qualifications is included in Appendix B and her CV in Appendix C.

There have been no problems to report.

Appendix A – Advisory Board Members

SAFER-SIM Advisory Board Members

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Appendix B – Appointment Request for Dawn Marshall

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November 10, 2014

Robin J. Kline, E-33, 466
Federal Grants Manager
U.S. Department of Transportation
Office of the Assistant Secretary for Research & Technology
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Robin,

It is with great regret that I must inform you that I will be leaving the University of Iowa on December 1, 2014. For this reason, I must resign as director of our UTC. I am requesting that you approve the appointment of Ms. Dawn Marshall to the director position effective that date. I have included Dawn's CV as an attachment to this letter.

I selected Dawn because of her strong organizational and communications skills. I have worked with Dawn for three years here as a collaborator and supervisor. She has been engaged in transportation safety research since 1997 and has been with NADS since 2004 where she has served as Principal Investigator, Project Manager and Data Collection Coordinator for several NHTSA funded projects as well as for the Iowa DOT, Rockwell Collins and other public and private sector clients. Before joining NADS she held research positions at the Cognitive Systems Lab and the Iowa Driving Simulator. She received a BA in Finance in 1988 and a BS in Industrial Engineering in 2001 and an MS in Human Factors Engineering in 2004 from the University of Iowa. Her business and operations training and experience will serve her well as director.

Dawn served as project manager for me on a large NHTSA-sponsored study on human factors in connected vehicles. That project involved coordinating reporting from two different sub-contractors. Dawn is currently Principal Investigator on a $1.6M NHTSA project on V2V Safety Applications. This project involves four other data collection sites across the country. Dawn has proven herself capable of coordinating the activities of multiple sub-contractors to ensure project completion on time and on budget.

Dawn's long history at the University of Iowa provides her with a rich network of campus contacts to utilize to further the goals of the center.

Dawn's professional and community service provides her with extensive experience planning and coordinating large community events for all ages, leading workshops, and providing presentations to continuing education groups. She has served on the board of directors for a daycare, a dance company, and two community education organizations. All of these positions involve planning and coordinating large community events and workshops. As a Girl Scout leader she assisted girls in obtaining numerous science related badges. Dawn has provided several driving safety presentations at local high schools and for the University of Iowa Lifelong Learning program.

Sincerely,

Susan T Chrysler

Susan T. Chrysler, Ph.D.

Appendix C – Dawn Marshall Curriculum Vitae

Dawn C. Marshall

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EDUCATION

M.S., Industrial Engineering, University of Iowa, Iowa City IA, 2004

B.S., Industrial Engineering, University of Iowa, Iowa City IA, 2001

B.A., Finance, University of Iowa, Iowa City IA, 1988

EXPERIENCE

National Advanced Driving Simulator, University of Iowa, Iowa City, IA Research Specialist, 2004 - present

Cognitive Systems Laboratory, University of Iowa, Iowa City, IA Research Assistant, 1998 – 2003

Iowa Driving Simulator, University of Iowa, Iowa City, IA Research Assistant (1997)

Clark Kenyon Decorating, Iowa City, IA Co-owner 1987 - 1997

Dawn Marshall, a Research Specialist with the National Advanced Driving Simulator (NADS) within the University of Iowa, has been engaged in driving research since 1997 and has been with NADS since 2004 where she has served as Principal Investigator, Project Manager and Data Collection Coordinator for several NHTSA funded projects as well as for the Iowa DOT, Rockwell Collins and other public and private sector clients. Before joining NADS she held research positions at the Cognitive Systems Lab and the Iowa Driving Simulator. She received a BS in Industrial Engineering in 2001 and an MS in Human Factors Engineering in 2004 from the University of Iowa where her thesis topic was the urgency and annoyance of warning tones for in-vehicle systems.

Ms. Marshall's research with NADS has spanned several topics including projects evaluating in-vehicle systems such as adaptive cruise control, lane departure warning, forward collision warning, and intersection violation warning. Her experience also

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includes the effectiveness of warning systems for older drivers, teen driving behavior near licensure, and integrated control heads for law enforcement. Recently, Ms. Marshall has been involved in development and evaluation of situation awareness measures within a connected vehicles context. Ms. Marshall is currently serving as Principal Investigator for a project that spans five data collection sites funded by NHTSA.

RESEARCH CONTRACTS AND GRANTS

Principal Investigator — December 2013 – present
V2V Safety Applications Study (MiniSim Multi-site)
National Highway Traffic Safety Administration, $955,000

Principal Investigator & Project Manager — February 2014 – present
Distracted Driving Task Acceptance Testing
Hyundai America Technical Center, Inc., $232,000

Principal Investigator & Project Manager — September 2010 – present
Human-Machine Interface (HMI) Analysis and Research
Rockwell Collins, $155,000

Project Manager — September 2011 – September 2013
Human Factors of Connected Vehicles Driver-Vehicle Interface Design Research and Distraction Assessment
National Highway Traffic Safety Administration, Task Order through Westat, Inc., $741,139

Task Lead — September 2011 – January 2014
Crash Warning Interface Metrics – Phase 3
National Highway Traffic Safety Administration, Task Order through Westat, Inc., $978,916

Principal Investigator — September 2010 – May 2011
Simulator Test Methodology: Evaluating the Effectiveness of Persuasive Fuel Economy Systems
General Motors, $198,760

Task Lead — September 2010 – December 2011
Advanced Countermeasures for Multiple Impairments (ACMI)
National Highway Traffic Safety Administration, $1,039,969

Task Lead — August 2009 – March 2011
Crash Warning Interface Metrics (CWIM) Part 2
National Highway Traffic Safety Administration, $1,049,861

Principal Investigator & Project Manager — March 2008 – August 2011

Enhancing the Effectiveness of Safety Warning Systems for Older Drivers
National Highway Traffic Safety Administration, $675,622

Project Coordinator November 2007 – August 2011
Advanced Vehicle-based Countermeasures for Alcohol-Related Crashes
National Highway Traffic Safety Administration, $2,500,000

Project Coordinator September 2008 – June 2011
Distraction Detection and Mitigation through Driver Feedback
National Highway Traffic Safety Administration, $1,000,000

Project Coordinator January 2006 – January 2007
SAfety VEhicle(s) using adaptive Interface Technology (SAVE-IT)
National Highway Traffic Safety Administration, $300,000

Project Coordinator October 2004 – June 2010
Novice Driver
National Science Foundation, $300,000

Collaborator August 2001- December 2004
Human Performance Issues Associated with Adaptive Cruise Control and Forward Collision Warning
National Highway Traffic Safety Administration, $500,000

PROFESSIONAL AFFILIATIONS AND AWARDS

Member Human Factors and Ergonomics Society 2000 – present

Research Professional Development Series, University of Iowa 2011

New Program Initiation – NADS Safe Driver Training Award, Center for Computer Aided Design 2010

PROFESSIONAL SERVICE

Reviewer for Human Factors and Ergonomic Society Annual Meeting 2006 – 2014

Reviewer for Transportation Research Board 2011 – 2014

Reviewer for Driving Assessment Conference 2006 – 2014

Member State Traffic Records Coordinating Committee, State of Iowa, 2010 - present

Engineering Staff Advisory Council, College of Engineering, University of Iowa Secretary 2006-2007, Executive Committee At-Large Member 2007-2008, Vice-President 2008-2009, and President 2009-2010

PUBLICATIONS, TECHNICAL REPORTS, AND PRESENTATIONS

Chrysler, S.T., Cooper, J., and Marshall, D.C. (2015) The Cost of Warning of Unseen Threats: Unintended Consequences of Connected Vehicle Alerts. Paper presented at the 94th Annual Meeting of the Transportation Research Board, Paper No. 5-2178, January 2015.

Brown, T., Marshall, D., Chrysler, S., Schmitt, R., (2014) Final Report: Crash Warning Interface Metrics: Protocol Completion. Washington, DC: National Highway Traffic Safety Administration

Brown, T., Marshall, D., (2014) Crash Warning Interface Metrics: Protocol Completion: Forward Crash Warning Simulator Protocol. Washington, DC: National Highway Traffic Safety Administration

Brown, T., Marshall, D., (2014) Crash Warning Interface Metrics: Protocol Completion: Forward Crash Warning Test Track Protocol. Washington, DC: National Highway Traffic Safety Administration

Brown, T., Marshall, D., (2014) Crash Warning Interface Metrics: Protocol Completion: Lane Departure Warning Simulator Protocol. Washington, DC: National Highway Traffic Safety Administration

Lee, J., Moeckli, J., Brown, T., Roberts, S., Victor, T., Marshall, D., Schwarz, C.,& Nadler, E. (2013). Detection of Driver Distraction Using Vision-Based Algorithms. 23rd International Technical Conference on the Enhanced Safety of Vehicles. Seoul, South Korea.

Marshall, D., Muller, D., (2013) Evaluation of Dashboard Mounted Emergency Vehicle Warning System (N13-001). Iowa City, IA: National Advanced Driving Simulator, The University of Iowa

Lee, J. D., Moeckli, J., Brown, T. L., Roberts, S. C., Schwarz, C., Yekhshatyan, L., Nadler, E., Liang, Y., Victor, T., Marshall, D., & Davis, C. (2013, May). Distraction Detection and Mitigation Through Driver Feedback. (Report No. DOT HS 811 547A). Washington, DC: National Highway Traffic Safety Administration.

Gawron, V., Brown, T., Marshall, D., (2012) Differences in Degree of Conflict Accepted in Younger and Older Drivers with a Lane Change Collision Avoidance System. National Research Council (U.S.). Transportation Research Board. Meeting (91st : 2012 : Washington, D.C.). Preprint CD-ROM. Paper No. 12-4376

Marshall, D., Wallace, R., Torner, J., (2011) Effectiveness of an Intersection Violation Warning System. 6th International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design 2011, Lake Tahoe, CA.

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Brown, T. Schwarz, C. & Marshall, D. (2011). Evaluating Forward Crash Warning on the NADS for CWIM (N11-001). Iowa City, IA: National Advanced Driving Simulator, The University of Iowa.

Marshall, D., Wallace, R., Torner, J., (2010) Final Report: Enhancing the Effectiveness of Safety Warning Systems for Older Drivers. Contract No. DTNH22-06-D-00043, Task Order 3. Iowa City, IA: National Advanced Driving Simulator.

Brown, T., Marshall, D. Dow, B. (2010). Validation of the National Advanced Driving Simulator For the Study of Young Driver Risk for the Center for Child Injury Prevention Science I/UCRC. (N10-017). Iowa City, IA: National Advanced Driving Simulator.

Brown, T., Moeckli, J., & Marshall, D. (2009). Use of a High-Fidelity Simulation to Evaluate Driver Performance with Vehicle Automation Systems. Paper presented at the HCI International 2009. San Diego, CA.

Marshall, D. (2008) HMI Analysis for Rockwell Collins iForce™ Vehicle Computer System (N2011-003), Iowa City, IA: National Advanced Driving Simulator

Dow, B., Brown, T., Marshall, D. (2008) Characterization of novice driver response to critical driving events research experiences for undergraduates. Washington, DC: National Science Foundation

Brown, T., Benn, C., Marshall, D., Moeckli, J. (2008) Heavy Truck ESC Effectiveness Study Using NADS. Washington, DC: National Highway Traffic Safety Administration

Dow, B., Brown, T., Marshall, D. (2008) Response to Intersection Conflict Situations Across Driver Age. Human Factors and Ergonomics Annual Meeting

Brown, T., Marshall, D., Moeckli, J., Smyser, T. (2007) SAfety VEhicle(s) using adaptive Interface Technology (SAVE-IT) Program: Task 14 Evaluation. (N2007-018) Iowa City, IA: National Advanced Driving Simulator

Brown, T., Marshall, D. (2007) Validation of the National Advanced Driving Simulator for the Study of Young Driver Risk for the Center of Child Injury Prevention Science I/UCRC (N2007-003) Iowa City, IA: National Advanced Driving Simulator

Brown, T., Dow, B., Marshall, D., & Allen, S. (2007). Validation of stopping and turning behavior for novice drivers in the National Advanced Driving Simulator. Driving Simulation Conference North America 2007, Iowa City, IA.

Senserrick T., Brown T., Marshall D., Quistberg D., Dow, B., & Winston F. (2007) Risky Driving by Recently Licensed Teens: Self-Reports and Simulated Performance. 4th International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design 2007, Stevenson, WA

Senserrick TM, Brown T, Quistberg DA, Marshall D, Ahmad O, & Winston FK. (2007). Validation of simulated assessment of teen driver speed management on rural roads. 51st Annual Scientific Conference of the Association for the Advancement of Automotive Medicine (AAAM), Melbourne, Australia.

Marshall, D., Lee, J.D., & Austria, P.A. (2007). Alerts for In-Vehicle Information Systems: Annoyance, Urgency, and Appropriateness. Human Factors, 49, pp. 145-157.

Lee, J., McGehee, D., Brown, T., and Marshall, D. (2006). Effects of Adaptive Cruise Control and Alert Modality on Driver Performance. Transportation Research Record, n 1980, 49-56.

Lee, J.D., Stoner, H., Marshall, D., (2004). Enhancing Interaction with the Driving Ecology through Haptic Interfaces. IEEE International Conference on Systems, Man and Cybernetics

Lee, J. D., Marshall, D., Austria, P. A., Wiese, E., and Williams, E. (2002). In-vehicle display icons and other information elements. Task E, Experiment 3. Urgency and annoyance of auditory alerts (Final Report). Iowa City, IA: University of Iowa.

Marshall, D., Lee, J. D., & Austria, A. (2001). Annoyance and urgency of auditory alerts for in-vehicle information systems. Human Factors and Ergonomics Annual Meeting, 2, 1627-1631.

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