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

Federal Grant No: DTRT13-G-UTC53

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

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Recipient Organization: The University of Iowa
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Iowa City, IA 52242

Recipient Identifying Grant Program No.: 15311500

Project/Grant Period: 10/21/13 – 9/30/2018

Reporting Period End Date: 03/31/2017

Report Term or Frequency: Semi-annual

Signature of Submitting Official:
Overview
Safety Research using Simulation University Transportation Center has completed the 7th performance period associated with the 2013 SAFER-SIM grant. The center continues its high standard of work in safety research, leadership development, education and workforce development, technology transfer, collaboration, program efficacy, and diversity.

SAFER-SIM received a 2016 Tier 1 UTC grant from the US Department of Transportation to promote safety. Due to this award, SAFER-SIM administrators and PIs will complete all research projects and submit all deliverables before the end of the next reporting period in order to close the 2013 grant early.

This report will describe the accomplishments, products, impacts, and plans of the center.

A copy of this report can be found on the SAFER-SIM website under the “Reports” tab or at the following URL: http://safersim.nads-sc.uiowa.edu/reports.php

1. Accomplishments

a. Goals and objectives of the program

The goal of the SAFER-SIM University Transportation Center 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. Research Activities

Funded projects

SAFER-SIM research projects continued making progress on research tasks. Eight research projects completed this period (Table 1: Completed Research Projects this Period). Overall, the UTC has 17 completed projects out of 44 total projects funded, including individual and collaborative research projects as well as education-related projects. 28 funded projects remain active. These active projects are in the final phases and will complete by June 30, 2017. The center did not issue an RFP this period and will not issue any more RFPs with the 2013 grant.

Table 1: Completed Research Projects this Period

<table>
<thead>
<tr>
<th>Research Project Title</th>
<th>School(s)</th>
<th>TRID Accession #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using Connected Vehicle Technology to Deliver Timely Warnings to Pedestrians</td>
<td>UI</td>
<td>01616923</td>
</tr>
<tr>
<td>Automated Road Segment Creation Process</td>
<td>UW</td>
<td>01620048</td>
</tr>
<tr>
<td>Phase I: Operational and Safety Based Analyses of Varied Toll Lanes</td>
<td>UPRM, UM, UCF</td>
<td>01530317</td>
</tr>
</tbody>
</table>
Effectiveness of In-Vehicle Virtual Traffic Control Devices | UW | 01530184

Exploring the Science of Driving | UI | 01556645

Phase II: Operational and Safety-Based Analyses of Varied Toll Lane Configurations | UPRM | 01630124

Identifying Postural Control and Thresholds of Instability Utilizing a Motion-Based ATV Simulator | UI | 01556648

Development and Evaluation of Infrastructure Strategies for Safer Cycling | UM | 01530182

Important information pertaining to SAFER-SIM research projects – including titles, abstracts, PIs, sites, and associated reports and summaries – can be accessed from the following webpage: http://safersim.nads-sc.uiowa.edu/research_new.php?searchTerm.

Webinars

SAFER-SIM continues sponsoring a monthly webinar series relating to SAFER-SIM research projects. These webinars highlight the expertise of consortium researchers to interested individuals, such as researchers from other consortium sites and universities, government employees within the Department of Transportation and other agencies, and professionals from the transportation industry. Presenters gain experience sharing their research findings to an audience. The webinars are recorded and uploaded onto the SAFER-SIM YouTube channel so they can be viewed and shared anytime.

SAFER-SIM sponsored 8 webinars during this reporting period (Table 2: Webinars Presented this Period) and will continue scheduling future webinars for next period.

<table>
<thead>
<tr>
<th>Title</th>
<th>Date</th>
<th>School(s)</th>
<th>Registrants</th>
<th>YouTube Views</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation of Real World Toll Plazas using Driving Simulators</td>
<td>10/11/2016</td>
<td>UCF, UPR, UMass</td>
<td>65</td>
<td>63</td>
</tr>
<tr>
<td>Project Title</td>
<td>Date</td>
<td>Institution</td>
<td>Registrants</td>
<td>YouTube Views</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>----------</td>
<td>--------------</td>
<td>-------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Transfer from Highly Automated to Manual Control: Performance &amp; Trust</td>
<td>11/8/2016</td>
<td>UI</td>
<td>55</td>
<td>78</td>
</tr>
<tr>
<td>Effectiveness of In-Vehicle Virtual Traffic Control Devices</td>
<td>11/29/2016</td>
<td>UW</td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td>Joint Pedestrian Road Crossing in an Immersive Pedestrian Simulator</td>
<td>12/16/2016</td>
<td>UI</td>
<td>25</td>
<td>52</td>
</tr>
<tr>
<td>Utilizing Micro Simulation to Evaluate the Safety and Efficiency of the Expressway System</td>
<td>2/14/2016</td>
<td>UCF</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td>Exploring the Science of Driving</td>
<td>2/28/2017</td>
<td>UI</td>
<td>77</td>
<td>57</td>
</tr>
<tr>
<td>Advanced Vehicle Technology Simulation and Research Outreach to STEM Programs</td>
<td>3/7/2017</td>
<td>UI</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>Analysis of Driver Performance and Operations at Intersections Auxiliary Through Lanes</td>
<td>3/21/2017</td>
<td>UMass</td>
<td>18</td>
<td>53</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>318</td>
<td>385</td>
</tr>
<tr>
<td><strong>Total Registrants and YouTube Views</strong></td>
<td></td>
<td></td>
<td>703</td>
<td></td>
</tr>
</tbody>
</table>

These webinars and past webinars can be found on the SAFER-SIM YouTube channel at the following URL: [https://www.youtube.com/channel/UCE8CN3JX8_mkAf8d8-UPzKQ](https://www.youtube.com/channel/UCE8CN3JX8_mkAf8d8-UPzKQ).

2. Leadership Development

*Students involved in SAFER-SIM projects*

SAFER-SIM students are an integral part of the University Transportation Center. 59 college students worked on SAFER-SIM projects this period (*Table 3: Student Breakdown*). The students learn under faculty/staff researchers and build a solid research foundation. By the time they graduate, they are skilled professionals with quality experiences and invaluable connections gained through SAFER-SIM.
Table 3: Student Breakdown

<table>
<thead>
<tr>
<th>Site</th>
<th># Students</th>
<th>Postsecondary Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Iowa</td>
<td>14</td>
<td>6 undergrad, 5 grad, 3 doctoral</td>
</tr>
<tr>
<td>University of Wisconsin – Madison</td>
<td>7</td>
<td>7 grad</td>
</tr>
<tr>
<td>University of Massachusetts – Amherst</td>
<td>15</td>
<td>8 grad, 7 doctoral</td>
</tr>
<tr>
<td>University of Central Florida</td>
<td>15</td>
<td>8 grad, 7 doctoral</td>
</tr>
<tr>
<td>University of Puerto Rico – Mayaguez</td>
<td>8</td>
<td>4 undergrad, 4 grad</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>59</strong></td>
<td>10 undergrad, 32 grad, 17 doctoral</td>
</tr>
</tbody>
</table>

Degrees in transportation Disciplines

Three University of Central Florida SAFER-SIM students received degrees in transportation disciplines during this period.

SAFER-SIM Symposium

The University of Iowa hosted the 5th SAFER-SIM Symposium on October 9 - 11, 2016 in Iowa City, Iowa. The center successfully organized symposia held at University of Puerto Rico – Mayaguez, University of Massachusetts – Amherst, University of Central Florida, and University of Wisconsin – Madison in previous reporting periods. The 3 eventful days in Iowa featured activities and experiences for students, staff, and faculty to develop leadership skills. The 64 attendees highlighted the focuses of SAFER-SIM: safety, research, and collaboration.

The symposium kicked off Sunday evening with a fun, networking social at a local restaurant in downtown Iowa City. Students and researchers from each consortium site attended this activity, which helped attendees learn more about each other’s work and interests. Later in the evening, Dr. Patricia Tice of AgriManners led attendees in a Business Etiquette Dinner in the McCord Club Lounge at Kinnick Stadium. She taught professional table manner skills important in any situation, especially at conferences and business dinners.
University of Iowa researcher Cara Hamann, whose research interests include vulnerable road users, organized and coordinated the SAFER-SIM Fun Run/Walk early Monday morning. Although it was a cold morning, 29 attendees (and 1 dog) completed either a 5K Run or 2K walk through the heart of the University of Iowa campus.

Symposium attendees toured and experienced 3 simulator labs at the University of Iowa involved with SAFER-SIM:

**ATV Simulator** – Gerene Denning and Charles Jennissen led a tour of the ATV Simulator. This simulator has a movable platform and uses motion sensors, a virtual reality headset, and an All-Terrain Vehicle. Work done by this lab helps prevent injuries among children and adults in rural communities.

**Hank Virtual Environments Lab** – Joe Kearney and Jodie Plumert guided attendees throughout their advanced bicycling and pedestrian simulators. Their lab features an instrumented bike mounted in a virtual environment, motion-tracking cameras that monitor pedestrian movements, active stereoscopic glasses to create a fully interactive and immersive environment, and an HTC VIVE virtual reality headset. Their research helps improve safety for vulnerable road users.

**National Advanced Driving Simulator** - Registrants of the SAFER-SIM Symposium attended an Open House at the National Advanced Driving Simulator. 10 students were able to drive or ride in the NADS-1, the world’s most advanced driving simulator, which has 13 degrees of freedom and a 360-degree virtual environment. The directors of each consortium site also had a chance to drive or ride in the simulator. The Open House included a poster session led by SAFER-SIM students and researchers, miniSim demonstrations, and an exhibit of the semi-automated advanced technology features in the Volvo XC90. The National Advanced Driving Simulator specializes in studying the connection between humans and vehicles.

SAFER-SIM students and researchers used the University of Iowa public transportation system to travel between labs. David Ricketts, Director of UI Parking & Transportation, spoke to them about managing and operating a public transportation system in a time of rapid transportation innovation.

Student presentations occurred after the tours. 10 students – 2 from each site – presented their SAFER-SIM research to a room full of attendees in a 15-minute talk. Each student received feedback on his or her presentation from fellow researchers. The professional development aids the students as they continue their education and begin careers.

Monday concluded with a relaxed, social dinner. A magician entertained parts of the room with various card, coin, and ball tricks while other groups continued discussing the day’s events. Attendees enjoyed the fun end to a busy day.

Tuesday began with presentations about Innovation, Entrepreneurship, and Intellectual Property. Leslie Flynn from the University of Iowa – College of Education described the STEM Innovator program, which equips teachers, students, and schools with the innovative tools and experiences they need to solve today’s problems. Other presenters included Dr. Barry Butler – UI Executive Vice President and Provost, Dr. Christal Sheppard – Director of the Midwest
Regional U.S. Patent and Trademark Office, and Mark Nolte – President and Director of Business Development of the Iowa City Area Development Group.

The last activity of the symposium was a live webinar in the UI Capital Senate Chambers. Michael Knodler of University of Massachusetts – Amherst, Mohamed Abdel-Aty of University of Central Florida, and Didier Valdes of University of Puerto Rico – Mayaguez presented their collaborative SAFER-SIM research about toll plazas. Thirty symposium attendees, University of Iowa faculty members, and members of the publics attended the presentation live while another 35 individuals attended virtually through the meeting software.

Peer Review Publications – 12 publications, 8 journals

- IEEE Transactions on Visualization and Computer Graphics

- Journal on Experimental Psychology: Human Perception and Performance

- ACM Transactions of Applied Perception

- Journal of Safety Research
  - Jennissen, CA, Harland, KK, Wetjen, K, Hoogerwerf, P, O'Donnell, L, Denning, GM. All-terrain vehicle safety knowledge, riding behaviors and crash experience of Farm Progress Show attendees. *Journal of Safety Research.* 2017, 60:71-78

- Transportation Research Record: Journal of the Transportation Research Board

- Accident Analysis & Prevention

- Transportation Research Part D: Transport and the Environment

- Special Issue on the Current State-of-the-Art of System Dynamics Modelling and Simulation

Conference Presentations and Papers – 11 conferences, 21 presentations and papers

- 10th University Transportation Centers Spotlight Conference: Pedestrian and Bicycle Safety
  - Hamann CJ, Schwarz C, Soniyi O (December 2, 2016). Safe overtaking of bicyclists and the presence of shared lane markings. 10th University Transportation Centers Spotlight Conference: Pedestrian and Bicycle Safety, Washington, DC.

- 96th Annual TRB Meeting
  - Implementation of Active Traffic Management Strategies for Safety of a Congested Expressway Weaving Segment (17-00248)
  - Bicycle Infrastructure from the Driver’s Seat: Evaluating Bicycle Infrastructure Using a Driving Simulator (17-01981)
  - Comparative Analysis of Toll Plaza Safety Features in Puerto Rico and Massachusetts Using a Driving Simulator (17-05393)
  - Safety Investigation of Combining Ramp Metering and Variable Speed Limits Strategies on Urban Freeways: A Simulation Study (17-01045)
  - Analysis of the Impact of Fog Warning systems on Driver Behavior Under Reduced Visibility Conditions Using a Driving Simulator (17-02698)
  - Supplemental Warning Traffic Signal to Improve Pedestrian and Bicycle Safety (17-22039)
Effects of Using High Occupancy Toll Lanes on Safety Performance of Freeways (17-06894)

- Mid-Continent Transportation Research Symposium
  - Hamann CJ, Schwarz C, Soniyi O (October 25, 2016). Driver performance around bicyclists and bicycle infrastructure. *Mid-Continent Transportation Research Symposium, Madison, WI.*

- Iowa Bicycle Summit
  - Hamann CJ (January 20, 2016). Iowa Specific Research on Bicycling Safety. *Iowa Bicycle Summit, Des Moines, IA.*

- 25th Enhanced Safety of Vehicles Conference

- American Public Health Association Annual Meeting

- Midwest Rural Agricultural Safety and Health Conference

- 5th International Conference on Roundabouts

- 5th International Conference on Models and Technologies for Intelligent Transportation Systems

- 20th EURO Working Group on Transportation Meeting

- 2017 Road Safety and Simulation Conference
  - Moatz Saad, Mohamed Abdel-Aty, Jaeyoung Lee, Kali Carroll. Driving behavior analysis at expressway toll plazas using driving simulation, Accepted and will be presented at Road Safety and Simulation (RSS-2017).
  - Yina Wu, Mohamed Abdel-Aty, Juneyoung Park. Evaluation of fog warning systems on driving behavior by driving simulator experiments Accepted and will be presented at Road Safety and Simulation (RSS-2017).

*Awards – 4 awards*
• Eleni Christofa (faculty), University of Massachusetts – Amherst
  o 2017 Outstanding Young Member Award, Transportation Research Board of the National Academies of Sciences, Engineering, and Medicine
• Nicholas Fournier (student), University of Massachusetts – Amherst
  o 2016 SAFER-SIM UTC Outstanding Student of the Year
  o 2016 Dwight D. Eisenhower Graduate Fellowship
• Joshua Wolfgram (student), University of Massachusetts – Amherst
  o 2016 Dwight D. Eisenhower Graduate Fellowship

Invited Presentations to Public Agencies – 8 presentations

• Iowa Local Traffic Safety Workshop
• University of Wisconsin – Madison
• University of Washington
  o Gonzales, E. Modelling Urban Traffic and Freight Deliveries. Invited talk at the University of Washington
• Local Technical Assistance Program, Iowa Department of Transportation
  o Hamann CJ (October 27, 2016). Transportation Safety Research Highlights, Local Technical Assistance Program, Iowa Department of Transportation, Council Bluffs, IA.
• Transportation Research and Education Center for Portland State University: Friday Transportation Seminar Series
  o Christofa, E., 2017. Addressing Data Challenges for Bicycle Crash Analysis, Transportation Research and Education Center for Portland State University Friday Transportation Seminar Series, 10 March, Portland, OR.
• University of Massachusetts Transportation Seminar
  o Christofa, E., 2017. Addressing Data Challenges for Bicycle Crash Analysis, University of Massachusetts Transportation Seminar Series, 2 March, Amherst, MA.
• Arizona State University
• Transportation Innovation Speaker Series

Journal editing and reviewing activity – 15 journals reviewed, 2 editorial boards

• Injury Journal
• Journal of Sustainable Transport
• American Journal of Preventative Medicine
• ACM Symposium on Spatial User Interaction 2016
• ACM Transactions on Applied Perception
• IEEE Symposium on 3D User Interfaces 2017
• IEEE Transaction on Human-Machine Systems
• IEEE Virtual Reality Conference 2017
• Accident Analysis and Prevention
• Applied Geography
• KSCE Journal of Civil Engineering
• Journal of Traffic and Transportation Engineering
• Journal of Transportation Engineering
• Traffic Injury Prevention
• Transportation Safety and Security
• Journal of Experimental Psychology: Applied – Editorial Board
• Journal of Experimental Child Psychology – Editorial Board

Leadership positions in professional organizations – 10 leadership positions

• Safe State Active Transportation/Built Environment Special Interest Group
• Iowa Strategic Highway Safety Plan Update Working Group
• Lifesavers Traffic Safety Conference – Bike/Pedestrian Committee Member
• TRB Standing Committee on Operator Education and Regulation (ANB30) Member
• TRB Standing Committee on Vehicle-Highway Automaton (AHB30) Member
• TRB Standing Committee on Transportation Safety Management (ANB10) Member
• Member of TRB AHB25 Traffic Signal Systems Committee, 2013-2020
• Member of TADD55 Task Force on Arterials and Public Health, 2015-2018
• Scientific committee for the 8th International Congress on Transportation Research (ICTR)

3. Education and Workforce Development

SAFER-SIM consortium members organized and participated in events focusing on students and members of the workforce. The SAFER-SIM metrics in this report occurred before January 1, 2017. Any education or workforce development activity after this date will be reported in the 2016 UTC PPPRs. A description of each event can be found on the SAFER-SIM website: http://safersim.nads-sc.uiowa.edu/education_2015.php
## K-12 Events – 17 events, 2338 students

<table>
<thead>
<tr>
<th>Event</th>
<th># Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boy Scout Council Camporee</td>
<td>500</td>
</tr>
<tr>
<td>Northeast Iowa Family STEM Festival</td>
<td>200</td>
</tr>
<tr>
<td>Harding 7th Grade Speaker Day</td>
<td>55</td>
</tr>
<tr>
<td>Girl Scout STEM Event</td>
<td>150</td>
</tr>
<tr>
<td>Cub Scout Tour</td>
<td>19</td>
</tr>
<tr>
<td>Johnson County Career Fair</td>
<td>100</td>
</tr>
<tr>
<td>Cedar Valley STEM Festival</td>
<td>366</td>
</tr>
<tr>
<td>Project Lead The Way Tours</td>
<td>55</td>
</tr>
<tr>
<td>Girls Tech Career Day</td>
<td>60</td>
</tr>
<tr>
<td>Franklin Middle School Speaker Day</td>
<td>76</td>
</tr>
<tr>
<td>Troop 120 Boy Scout Tour</td>
<td>15</td>
</tr>
<tr>
<td>2016 STEM Institute for Young Scientists</td>
<td>239</td>
</tr>
<tr>
<td>Washington County STEM Festival</td>
<td>193</td>
</tr>
<tr>
<td>Taft 7th Grade Speaker Day</td>
<td>67</td>
</tr>
<tr>
<td>Lone Tree Mock Interviews</td>
<td>6</td>
</tr>
<tr>
<td>ATV Safety Training Program STARS</td>
<td>227</td>
</tr>
</tbody>
</table>

## Workforce Development – 35 individuals

SAFER-SIM at the University of Iowa hosted 10 Job Corps students from Ottumwa, IA on October 6, 2016. Job Corps is a technical training program that helps young people improve their quality of life through career and academic training. The students that toured the facility are training to be professional bus and truck drivers, and they learned how SAFER-SIM researches different transportation safety issues.

The Global Road Safety Online Training Pilot offered by researchers at the University of Iowa will introduce participants to road safety problems, data sources, research methods used in the
field, and how intervention and prevention programs are developed and evaluated. This course is taking place on Tuesdays in April with a full class of 25 participants. These participants include people from the University of Iowa, University of Wisconsin – Madison, Iowa State University, Kansas University, Iowa City Police Department, and VTI in Sweden.

Employment status of past students – 1 student employed

- Behavioral Health Coordinator, University of Iowa

Curriculum Modules Developed – 4 modules

The University of Iowa developed 4 online course modules stemming from the Global Road Safety Development Project.

Continued contact with trade groups – 2 trade group contacts

- University of Iowa is in communication with Soteria Technologies, Inc. of Cedar Rapids in regards to development of innovative technology for bicycle safety.
- University of Iowa coordinated a product explanation and demonstration meeting between SAFER-SIM consortium sites and representatives from the simulation software company VT MAK.

4. Technology Transfer

Final Research Reports and Summaries – 8 reports, 8 summaries

The 8 research projects that completed this period submitted final technical research reports and corresponding 2 page summaries. The technical reports vary in length but provide enough information for fellow researchers to understand the research questions, methods, and results. The final reports have been shared with TRID and can be found in RiP. The 2 page summaries of each project are available for a quick overview of the projects. These summaries focus on recommended practices for transportation professionals providing easier access to key information than the technical report.

Webinars – 8 webinars

SAFER-SIM has hosted 8 webinars over the course of this reporting period. Each consortium site presented at least one webinar. The themes of the webinars relate to vulnerable road users, simulation techniques, advanced vehicle technology, and traffic control devices. Students, researchers, and industry professionals from the United States and other countries view the SAFER-SIM webinars.

- 8 webinars
- 318 live-webinar attendance
385 YouTube views
703 total webinar views
87 views/webinar

**Online Presence**

Website – The website for SAFER-SIM is used to host research final reports and summaries and used to share recent news and progress. The website has been updated to reflect the information in the 2016 UTC grant. The website homepage is located at the following URL: [http://safersim.nads-sc.uiowa.edu](http://safersim.nads-sc.uiowa.edu)

Social Media – SAFER-SIM is active on Twitter, Facebook, and YouTube. These accounts help followers keep up to date with the most recent webinars, final reports, and other news. Social media allows the UTC to reach a larger audience. SAFER-SIM has interacted with the USDOT, NHTSA, and various organizations and individuals within the transportation industry through these different platforms, which has led to 15,553 impressions on Twitter.

News Digest – Another method SAFER-SIM uses to reach more individuals is through a news digest. 308 subscribers receive content featuring SAFER-SIM news, webinars, final reports, and other automotive and safety news. The news digest was sent out 8 times during this performance period

**Tours of facilities – 7 tours, 107 individuals**

- University of Puerto Rico, Mayaguez toured the Hank Lab – 8 people
- SAFER-Symposium tours of University of Iowa labs – 64 people
- ProSimulador, a Brazilian company, toured the Hank Lab – 3 people
- University of Iowa Information Technology Campus Leaders toured Hank Lab – 30 people
- Graduating computer science students – 6 people
- KCRG news team – 4 people
- University of Massachusetts Transportation Center – 2 people

**Media requests – 4 media requests**

- “UI grad’s student employment put him on the road to his career,” Iowa Now [https://now.uiowa.edu/2016/10/ui-grads-student-employment-put-him-road-his-career](https://now.uiowa.edu/2016/10/ui-grads-student-employment-put-him-road-his-career)
- “Public health researcher and avid cyclist studies and advocates for improved bicycle safety,” Iowa Now
Vendors using technologies developed – 2 vendors

Automated driving software developed at the University of Iowa will be used in upcoming projects for 2 different projects at the National Advanced Driving Simulator.

Joint technology transfer activities and programs – 1 activity

The technology developed by a project led by Drs. Gaspar and Noyce to generate simulator scenarios from naturalistic driving data is being used to generate simulator scenarios and collect data at the University of Wisconsin – Madison and the University of Iowa.

Events with other UTCs – 2 events

- University of Iowa hosted the SAFER-SIM Symposium
- University of Iowa is in discussions with the Regional UTC in Kansas about collaborating on data sharing

Others using simulation techniques – 1 technique

The University of Iowa Hank Lab is working with the University of Puerto Rico, Mayaguez to use pedestrian simulation software.

5. Collaboration

A main focus of the SAFER-SIM UTC is collaboration within consortium sites and across disciplines. Eight multiple-site collaborative projects and 10 interdisciplinary projects have been funded, making up 42% of SAFER-SIM projects. Consortium members engage in regular web conferencing, teleconferences, and email communications, as well as face-to-face interactions via site visits and time set aside during symposia. Site directors participate in a conference call once a month to share information about the progress at each university. The site directors also had an in-person meeting during the SAFER-SIM Symposium and at the TRB Annual Meeting.

Regular updates to the SAFER-SIM website and social media accounts allow for up-to-date project information and outreach activities to spur ideas across sites. The webinar format builds greater engagement and a broader exchange of ideas among students, faculty, and industry professionals. SAFER-SIM also emails a biweekly news digest to over 300 individuals holding academic, government, and transportation industry positions. The email’s content includes SAFER-SIM final reports, news, webinars, and automotive technology and safety news.
Researchers and students stay connected with each other through various platforms to conduct research and to share ideas.

SAFER-SIM researchers have a diverse range of professional backgrounds that span across many colleges throughout the universities. The variety of expertise within the consortium creates a collaborative environment to address safety issues from different perspectives. Some backgrounds include:

- Engineering
- Public Health
- Psychology
- Psychological & Brain Sciences
- Computer Science
- Emergency Medicine
- Science Education

6. Program Efficacy

SAFER-SIM continues to work diligently to complete research projects by projected end dates. Principal investigators submit progress reports to SAFER-SIM administrators before the deadline. SAFER-SIM administrators ascertain grant deliverables are submitted on time and ensure grant compliance.

Due to SAFER-SIM’s successful history, the Center was awarded a 2016 UTC Tier 1 grant to Promote Safety. SAFER-SIM administrators, directors, PIs, and students will continue to be leaders in transportation safety and simulation as the UTC closes the 2013 grant and transitions to the 2016 grant.

Projects funded by other agencies – 2 projects, $2,054,821

- Toyota Motor Engineering & Manufacturing of North America, Inc.

- US Department of Transportation, Federal Highway Administration
  - “Developing Connected Simulation to Study Interactions Between Drivers, Pedestrians, and Bicyclists” Daniel V. McGehee (PI), Joseph Kearney (Co-I), Jodie Plumert (Co-I), Stephen Baek (Co-I), Chris Schwarz (Co-I), US Department of Transportation, Federal Highway Administration, 9/30/17-9/29/19, $1,395,931.

7. Diversity
SAFER-SIM impacts underserved and underinvested populations by bringing more minority students into the transportation sector. The minority groups represented include various people of color, Asian and Hispanic ethnic origins, and women. 44 students from these groups worked on SAFER-SIM projects this period (Table 4: Minority Students)

<table>
<thead>
<tr>
<th>Site</th>
<th># Minority Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Iowa</td>
<td>10</td>
</tr>
<tr>
<td>University of Wisconsin – Madison</td>
<td>7</td>
</tr>
<tr>
<td>University of Massachusetts – Amherst</td>
<td>4</td>
</tr>
<tr>
<td>University of Central Florida</td>
<td>15</td>
</tr>
<tr>
<td>University of Puerto Rico – Mayaguez</td>
<td>8</td>
</tr>
<tr>
<td>Totals</td>
<td>44</td>
</tr>
</tbody>
</table>

A SAFER-SIM consortium member, the University of Puerto Rico – Mayaguez is a minority serving institution. In addition, minority students make up one-third of the student population at the University of Central Florida. SAFER-SIM is dedicated to educating the next generation of safety professionals, building the transportation workforce for tomorrow, and fostering a vibrant community of simulation researchers.

The different locations of each SAFER-SIM site help the research represent a diverse portion of the population. The University of Iowa and the University of Wisconsin – Madison recruit individuals from a more-rural background. They are also able to share transportation safety findings at outreach events in rural communities, which are often times overlooked. University of Massachusetts – Amherst and University of Central Florida are located in urban environments. Researchers at these sites examine driving habits specifically associated with metropolitan transportation. The University of Puerto Rico – Mayaguez is able to research the driving habits of predominately Hispanic individuals. The different locations of the SAFER-SIM sites help produce research that depicts the diverse range of driving behaviors from a diverse set of participants, which will lead to a better overall understanding of the way people drive.

b. Products
Products are described in sections above. Product counts are indicated with bold text.

c. Participants & collaborating organizations
Significant collaboration continues across departments and institutions within SAFER-SIM and with other partners. The symposia held by SAFER-SIM have provided transportation students and facility with valuable networking and collaboration opportunities. The relationship forged during these events
branch out into the transportation workforce as students involved in SAFER-SIM projects join the workforce or pursue additional education at other institutions. Consortium institutions collaborate with state DOTs and other organizations on events that focus on transportation safety and mobility.

d. Impact

Research Impact
The impact of SAFER-SIM research projects will lead to a better understanding of road-user behavior and the advancement of simulation techniques and technologies.

Leadership Development Impact
The impact of leadership development among SAFER-SIM researchers and students will lead to improved research, increased publications, and overall improvement in safety research using simulation.

Education and Workforce Development Impact
The impact of SAFER-SIM education and development will create curious students and employees in the transportation industry that will lead to advanced innovations and improved safety.

Technology Transfer Impact
The impact of SAFER-SIM technology transfer will result in the spread of safety research and information, and individuals will be more conscious about transportation safety.

Collaboration Impact
The impact of SAFER-SIM collaboration will lead to a large network of interdisciplinary, safety professionals driving transportation forward in all industries and locations.

Program Efficacy Impact
The impact of SAFER-SIM program efficacy will lead to continued funding of the center and the University Transportation Center Program.

Diversity Impact
The impact of SAFER-SIM diversity will lead to improved transportation safety in less privileged communities and will open the door for future, minority transportation professionals.

e. Changes/Problems
Nothing to report

2. Plan for Next Reporting Period

SAFER-SIM plans to complete all projects and submit all written deliverables before the end of the next reporting period. In doing so, the UTC plans to close out the 2013 grant early to allow more resources to focus on the recently awarded 2016 SAFER-SIM UTC grant. Webinars will occur more frequently during the next reporting period as more projects complete before the 2013 grant closes. SAFER-SIM will continue education and outreach programming, but the events and numbers will be reported in the 2016 UTC PPPR.

- Complete all research projects
- Submit all deliverables
• Complete or schedule all webinars
• Continue education and outreach programming
• Continue regularly scheduled director calls
• Continue online communications