



## PROGRAM PROGRESS 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 Program Director

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**Recipient Organization:** The University of Iowa  
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**Reporting Period End Date:** 9/30/2018

**Report Term or Frequency:** Semi-annual

**Signature of Submitting Official:**

## 1. Accomplishments

### *Program Goals*

The goal of the SAFER-SIM University Transportation Center have been to use simulation techniques to address the safety issues prioritized by the US DOT through research, leadership development, education and workforce development, technology transfer, collaboration, and diversity.

Research - SAFER-SIM worked to synergize research from human factors, engineering, and other disciplines. The center has developed solutions for safer travels in the US and globally by applying simulation techniques to a broad range of safety problems and providing the development capability and application experience to support multi-modal safety research.

Throughout the grant SAFER-SIM funded 43 projects total across the five consortium sites – University of Iowa (UI), University of Wisconsin Madison (UW), University of Massachusetts Amherst (UM), University of Central Florida (UCF), and University of Puerto Rico Mayaguez (UPR).

The final 10 projects completed all deliverables during this period. Those projects are:

Research Project Title	School(s)	TRID Accession #
Impact of Deflection Angle on Roundabout Driver Behavior	UM	<a href="#">01667443</a>
Using Driver Simulators to Assess Instructional Format Efficacy on Older and Younger Drivers' Understanding of Adaptive Cruise Control	UI	<a href="#">01675266</a>
Neural Correlates of Older Driver Performance	UW	<a href="#">01676955</a>
Distributed Simulation to Support Driving Safety Research	UI	<a href="#">01676949</a>
Safety Evaluation of Urban Freight Deliveries using Microsimulation and Surrogate Safety Measures	UM	<a href="#">01667042</a>
A Field and Simulator Evaluation of All-Red Clearance Intervals for use in Left Turn Applications	UM, UW	<a href="#">01673356</a>
A Driving Simulator Evaluation of Red Arrows and Flashing Yellow Arrows in Right Turn Applications	UM, UW	<a href="#">01667446</a>

Speeding on Curves & Potential Countermeasures: A Driving Simulator Assessment	UM	<a href="#">01670239</a>
Agent-Based Simulation for Investigating the Safety Concerns of Electric Vehicles in the US	UCF	<a href="#">01680186</a>
Phase III: Operational and Safety-Based Analyses of Varied Toll Lane Configurations	UPR	<a href="#">01675298</a>

Leadership Development - SAFER-SIM is recognized nationally and internationally as leaders in transportation safety research with particular distinction in applying simulation to safety problems. Consortium members are active participants at professional meetings, regularly contributing papers and presentations with the overall goal of developing the next generation of leaders in safety research and simulation methods. Researchers and students gained valuable experience through SAFER-SIM work. This period, they continued representing the center at professional meetings and through scholarly endeavors to contribute to the advancement of simulation and road safety.

This period SAFER-SIM researchers have shown leadership in their respective fields by authoring 7 peer-reviewed publications and 12 conference presentations. Researchers participated on 32 panels and advisory committees, reviewed for 27 journals, and held 6 journal editorships.

*Panels & Advisory Committees*

- Member of TRB Standing Committee on User Information Systems (AND20) – (Dawn Marshall)
- Chair of TRB Human Factors of In-Vehicle Systems, AND20(1), Joint Subcommittee of AND20, AND10 – (Dawn Marshall)
- Member of TRB Ahead of the Curve, ABG20(6). Joint subcommittee of ABG10 and ABG20 – (Jacob Heiden)
- Member of TRB Standing Committee on Alcohol, Other Drugs, and Transportation (ANB50) – (Timothy Brown, Jaeyoung Lee)
- Member of TRB Standing Committee on Vehicle-Highway Automation (AHB30) – (Chris Schwarz)
- Member of TRB Standing Committee on User Information Systems (AND20) – (John Gaspar, Mohamed Abdel-Aty)
- Co-chair of TRB Standing Committee on Simulation and Measurement of Vehicle - and Operator Performance (AND30) (co-chair) – (Omar Ahmad)
- Member of TRB Section - Users Performance (AND00) – (Omar Ahmad)
- Member of TRB Standing Committee on Motorcycles and Mopeds (ANF30) –

(Omar Ahmad)

- All-Red Clearance Intervals for Use with Flashing Yellow Arrows in the Left-Turn Application – TRB Eisenhower “Every Day Counts” Panel (Francis Tainter)
- Member of TRB AND50 Standing Committee on Traffic Control Devices (Mike Knodler)
- Member of TRB AHB25 Traffic Signal Systems Committee, 2013-2020 (Eleni Christofa)
- Member of TADD55 Task Force on Arterials and Public Health, 2015-2018 (Eleni Christofa)
- Member of TRB Standing Committee AHB45 Traffic Flow Theory and Characteristics (Eric Gonzales)
- Member of TRB Standing Committee AP060 Paratransit (Eric Gonzales)
- Applied Human Factors and Ergonomics (AHFE 2017-Present) Scientific Advisory Board. (Didier Valdés)
- Applied Human Factors and Ergonomics (AHFE 2017-Present) Scientific Advisory Board. (Benjamín Colucci)
- Panel Member of NCHRP Project (SN4811): Practices in One Lane Traffic Control on a Two-Lane Rural Highway (Benjamín Colucci)
- Member Best Paper Award TRB Committee AHB55 Work Zone Traffic Control (Benjamín Colucci)
- Member of the Advisory Committee of the Puerto Rico-State Transportation Innovation Council (STIC) (Benjamín Colucci)
- Member of the Advisory Committee of the US Virgin Island-State Transportation Innovation Council (STIC) (Benjamín Colucci)
- Latin American and Caribbean Consortium of Engineering Institution (LACCEI) (Benjamín Colucci)
- International Multi-Conference for Engineering, Education, and Technology Scientific Advisory Board (Benjamín Colucci)
- Co-Chair of the Traffic Enforcement Committee, International Road Federation. (Benjamín Colucci)
- Member of TRB Committee, AHB65 Operational Effects of Geometrics (Alberto Figueroa)
- Member, Committee on Highway Safety Performance (AND25) (2014-ongoing) (Mohamed Abdel-Aty)
- Member, Committee on Data, Analysis and Evaluation (ANB20) (2017 – ongoing) (Mohamed Abdel-Aty)
- Chair International Symposium on Accident Analysis and Prevention, Changsha, Sep 2018 (Mohamed Abdel-Aty)
- Scientific committee member, Road Safety on 5 Continents, Korea, May 2018. (Mohamed Abdel-Aty)

- Co-Chair, 5th International Symposium on Transportation Safety, Tongji University, Shanghai, China, Sep 24-26, 2017. (Mohamed Abdel-Aty)
- Co-Chair, Subcommittee on Transportation Safety Planning (ANB10(3)) (2018-ongoing) (Jaeyoung Lee)
- Member, Committee on Transportation Safety Management (ANB10) (2016-ongoing)

#### *Journal Editing*

- 2017 International Workshop on Materials Science and Mechanical Engineering (IWMSME 2017), Reviewer (Kearney)
- Accident Analysis and Prevention (reviewer, Reyes & O'Neal), (reviewer Kearney), (reviewer, Knodler and Christofa)
- ACM SIGGRAPH, Reviewer (Kearney)
- ACM Transactions on Applied Perception, Reviewer (Plumert)
- Advances in Civil Engineering, Reviewer (Kearney)
- Applied Ergonomics, reviewer (Samuel)
- Child Development Perspectives, Reviewer (Plumert)
- Ecological Psychology, reviewer (Plumert)
- Human Movement Science, Reviewer (Plumert)
- IEEE Transactions on Human-Machine Systems, reviewer (Kearney)
- IEEE Virtual Reality Conference 2018, Reviewer (Kearney, Plumert)
- International Journal of Digital Human (Stephen Baek, Editorial Board Member)
- Journal of Experimental Child Psychology (Editorial Board, Plumert), (Reviewer, Plumert)
- Journal of Experimental Psychology: Applied (Editorial Board, Plumert), (Reviewer, Plumert)
- Journal of Human Factors, reviewer (Samuel)
- Journal of Virtual Reality and Broadcasting, reviewer (Kearney)
- Nature (reviewer, O'Neal)
- Public Library of Science One (reviewer, O'Neal)
- Spatial Cognition and Computation, Reviewer (Plumert)
- The 2nd Annual Workshop on Materials Science and Mechanical Engineering, Reviewer (Kearney)
- The American Society of Mechanical Engineers (ASME) Press, Reviewer (Kearney)
- the Research Foundation - Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO), Reviewer (Kearney)
- Transportation Research Board Annual Meeting, Reviewer (Kearney)
- Transportation Research Part D: Transport and Environment (Christofa)
- Transportation Research Part F: Psychology and Behaviour, reviewer (Kearney)
- Transportation Research Record (Reviewer, Reyes & O'Neal), (reviewer, Knodler &

Christofa)

- Transportation Science, reviewer (Samuel)

#### *Journal Editorships*

Dr. Mohamed Abdel-Aty

- Editor-in-Chief (July 2013 – present), Accident Analysis and Prevention, Elsevier

Dr. Jaeyoung Lee

- Academic Editor (May 2018 – present), Journal of Advanced Transportation, Wiley/Hindawi

Jodie Plumert

- Editorial Board, Journal of Experimental Psychology: Applied
- Editorial Board, Journal of Experimental Child Psychology

Eleni Christofa

- Guest Editor for Transportation Research Part C: Emerging Technologies Special Issue on “Trajectory-based Modeling, Design, Operation and Assessment of Road Transportation Systems.”

Benjamin Colucci

- Dimension Journal of the College of Engineers and Surveyors of Puerto Rico, Editor-in-Chief.

Education and Workforce Development - SAFER-SIM has been dedicated to educating the next generation of safety professionals, building the transportation workforce for tomorrow, and fostering a vibrant community of researchers. Education and workforce development efforts were focused toward K-12, university, and continuing education students through curriculum development, video clips, traveling simulators, and outreach to community events.

SAFER-SIM consortium members continue to engage students of all levels in transportation, safety, and STEM (science, technology, engineering, and math). Sites organize and participate in events focusing on students and members of the workforce. The center has interacted with 1474 individuals during this period STEM fairs, school visits, county and state fairs. Other highlights below:

- 3 students graduated this period with degrees in transportation disciplines
  - Francis Tainter, University of Massachusetts Amherst, MS in Civil Engineering May 2018
  - Bryan Ruiz Cruz, University of Puerto Rico Mayaguez, MS in Civil Engineering, June 2018.
  - Johnathan Ruiz Gonzalez, University of Puerto Rico Mayaguez, MS in Civil Engineering, June 2018.
- 2 students found full time employment
  - Bryan Ruiz Cruz, June 2018, CMA Architects & Engineers LLC

- Johnathan Ruiz Gonzalez, June 2018, CMA Architects & Engineers LLC
- The Science of Driving Curriculum was used in K-12 lessons with three Iowa schools
  - Bettendorf Middle School
  - Prairie Ridge Elementary
  - Muscatine Middle School
- The Global Road Safety course was taught in-person as a semester long undergraduate class at the University of Iowa to 8 students.
- Labs at the University of Iowa provided tours to university students
  - Institute of Industrial and Systems Engineers Regional Conference
  - Undergraduate Vehicle Systems Dynamics Course
  - Visiting Scholars from Pakistan
  - Iowa State Transportation Student Association
- Labs at the University of Iowa provided tours to K-12 students
  - St. Dominich's High School Computer Science
  - Newton High School Pre-calculus
  - Ron Bandy's Driver Education
  - Junior Scholars Institute
  - Women in Science and Engineering
  - Perry Research Scholars Institute
  - Secondary Student Training Program
- The portable simulator was used in a safety demonstration at an Iowa company and community events, and it was used to attract K-12 students to careers in transportation and STEM fields.
  - Iowa City Parks & Rec STEAM Fest
  - Anamosa STEM Festival
  - Jefferson County STEM Festival
  - 2018 Juneteenth Celebration
  - Barnyard Bash
  - Rollin Rally
  - STEM Day at the Johnson County Fair
  - Iowa State Fair
  - Highland STEM Night
  - South Slope Driver Training Presentation
  - Schools/festivals?

Technology Transfer - Technology transfer activities focused on disseminating our work in traditional and nontraditional ways to translate research into practice and policy.

Projects funded by SAFER-SIM work toward technology transfer goals from the beginning through completion. State DOTs, industry partners, and other agencies work with

researchers by using their expertise or findings to inform decisions that guide future research and projects.

- UI will use automated driving software in upcoming projects for Toyota and Aisin
- Technology developed in a SAFER-SIM project will generate simulator scenarios from naturalistic data to be used in future work at UW and UI
- UM utilized tactics developed at UW to create a simulator environment for a project
- A collaborative project between UM and UW led to a project funded by the National Cooperative Highway Research Program
- A distributed simulation project at UI led to a related project funded by the Federal Highway Administration
- UPR provided additional training to Metropistas LLC, Public Private Partnership (PPP) with the Puerto Rico Department of Transportation and Public Works regarding the safety and operational recommendations associated with the PR-22 DTL.

The University of Iowa worked with individuals from government and industry to discuss capabilities and transfer of results to impact commercial technology and public use. The following organizations visited the University of Iowa this period:

- MIE visitors from Hong Kong
- Mechdyne
- Ergan UC and Parkinson's Center
- Mobileye
- Aisin
- Iowa Bicycle Coalition
- Metrotech
- City of Iowa City
- Pharmacy faculty from Japan
- Iowa Association of Business and Industry
- Iowa City Chamber of Commerce Leadership Program
- FHWA
- NHTSA
- Iowa Board of Regents
- Minister of Manitoba Infrastructure
- SmartEye
- John Deere
- Johnson County Advanced Manufacturing
- Volvo Group

Collaboration - Strong collaboration efforts have taken place among consortium sites, within consortium sites, and with government agencies and industry partners.



Collaboration at the center played an important role in reaching goals in all areas. Of the 43 total projects funded, six involved more than one site. Two of those projects completed this period.

Further discussion on collaboration accomplishments in Section 3 - Participants & Collaborating Organizations

Diversity - SAFER-SIM has been committed to promoting diversity by supporting minority participation throughout our work and community outreach. 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 projects supported diverse students and interacted with diverse populations through community outreach.

This period the center participated in three events focused on diversity and interacted with 110 underrepresented/minority individuals. Below are those events:

- Women in Science and Engineering Tour
- 2018 Juneteenth Celebration
- Society of Women Engineers Tour

*Result dissemination*

All technical reports from the center’s research projects have been completed and published on the federal databases online as the grant required. Additionally, research projects were required to submit 2-page summaries and prepare online webinar presentations about their results which have been shared with contacts in academia, industry, and government. These summaries and webinars focus on recommendations, specifications, and guidelines for practitioners. The final reports, summaries, and webinars can all be accessed through the research projects on the center’s webpage here: [http://safersim.nads-sc.uiowa.edu/research\\_new.php?searchTerm](http://safersim.nads-sc.uiowa.edu/research_new.php?searchTerm)

The final 10 webinars for this grant were presented during this period. 121 individuals attended the webinars live, and another 285 viewed the recordings on YouTube. The webinars are below:

Title	Date	School(s)
A Driving Simulator Investigation of Road Safety Risk Mitigation Under Reduced Visibility	4/10/2018	UCF
Safety Evaluation of Urban Freight Deliveries using Microsimulation and Surrogate Safety Measures	4/24/2018	UM

Do Prohibitive Warnings Improve Road-Crossing Safety for Texting and Non-texting Pedestrians	5/8/2018	UI
Speeding on Curves & Potential Countermeasures: A Driving Simulator Assessment	6/26/2018	UM
Evaluation of Flashing Yellow Arrows for use in the Left- and Right-Turn Applications	7/10/2018	UM, UW
Impact of Deflection Angle on Roundabout Driver Behavior	7/24/2018	UM
Operational and Safety-Based Analyses of Varied Toll Lane Configurations	8/7/2018	UPR
Dynamic Signage for Visually Impaired Pedestrian Safety at Roundabout Crossings	8/21/2018	UM
Neural Correlates of Older Driver Performance	9/11/2018	UW
Modeling the effect of electric vehicle adoption on pedestrian traffic safety: An agent-based approach	9/25//2018	UCF

SAFER-SIM researchers and students shared their work through journal publications and conference presentations.

Journals publishing our work this period include:

- Transportation Research Record: Journal of Transportation Research Board
- Transportation Engineering, Part A: Systems
- Human Factors
- ACM Transactions on Applied Perception
- Springer Journal and Cognition, Technology and Work

Conferences featuring our work this period include:

- Transportation Research Board 98th Annual Meeting
- Road Safety on Five Continents
- International Symposium of Accident Analysis and Prevention
- International Symposium of Accident Analysis and Prevention
- ITS World Congress
- ITE International and Midwestern/Great Lakes Districts Annual Meeting and Exhibit

Outreach efforts continued in K-12 and college-related events and in local communities by sharing research and simulator technologies to enhance public understanding and increase interest in STEM education and transportation careers. The center interacted with 1474 individuals in the community during this period. Further description of the community partners is described Participants & Collaborating Organizations.

### *Plans for next reporting period*

No plans for the next reporting period. The final performance period ended September 30, 2018.

## **2. Products**

### *Publications, conference papers, and presentations*

This period, the center produced:

- 7 journal articles
- 20 conference papers/presentations

### *Journal publications:*

- Qing Cai, Moatz Saad, Mohamed Abdel-Aty, Jinghui Yuan, and Jaeyoung Lee (2018). Safety impact of weaving distance on freeway facilities with managed lanes using both microscopic traffic and driving simulations. *Transportation Research Record: Journal of Transportation Research Board*, 0361198118780884.
- Moatz Saad, Mohamed Abdel-Aty, Jaeyoung Lee, and Ling Wang (2018). Safety Analysis Of Access Zone Design For Managed Toll Lanes On Freeways. *Journal of Transportation Engineering, Part A: Systems*, Volume 144, Issue 11
- Wang, L., Abdel-Aty, M., & Lee, J. Implementation of Active Traffic Management Strategies for Safety of a Congested Expressway Weaving Segment. *Transportation Research Record: Journal of the Transportation Research Board*. DOI: 10.3141/2635-04
- Rahimian, P., O’Neal, E., Plumert, J. M., and Kearney, J. K. (2018). Harnessing vehicle-to-pedestrian (V2P) communication technology: Sending traffic warnings to texting pedestrians. *Human Factors*. Advance online publication: DOI: 10.1177/0018720818781365
- Jiang, Y., O’Neal, E.E., Yon, J.P., Franzen, L., Rahimian, P., Plumert, J.P., and Kearney, J.K. (2018). Acting together: Joint pedestrian road crossing in an immersive virtual environment. *ACM Transactions on Applied Perception*, 15 (2), Article 8, 13 pages. <https://doi.org/10.1145/3147884>
- Schwarz, C., Gaspar, J., Brown, T. L., (2018) “The Effect of Reliability on Drivers’ Trust and Behavior in Conditional Automation”, *Springer Journal and Cognition, Technology and Work*
- Keklikoglou, Andronikos, Fitzpatrick, Cole D., and Michael Knodler. (2018) “Investigation of Time and Speed Perception using a Driving Simulator.” *Transportation Research Record: Journal of Transportation Research Board*, 0361198118776519.

*Books or other non-periodical, one-time publications:*

Nothing to report

*Other publications, conference papers and presentations:*

- Moatz Saad, Mohamed Abdel-Aty, Jaeyoung Lee, Qing Cai, Yina Wu, and Kali Carroll (2019). Exploring Safety Impacts of Geometric and Signage Designs at Hybrid Toll Plazas. Transportation Research Board 98th Annual Meeting. [Submitted].
- Moatz Saad, Mohamed Abdel-Aty, Jaeyoung Lee, and Ling Wang (2018). “Determining the optimal access design of managed lanes considering dynamic pricing.” Road Safety on Five Continents (RS5C), May 2018.
- Moatz Saad, Mohamed Abdel-Aty, Jaeyoung Lee, and Ling Wang (2019). Integrated Safety and Operational Analysis of the Access Design of Managed Toll Lanes. Transportation Research Board 98th Annual Meeting, Submitted.
- Moatz Saad, Mohamed Abdel-Aty, Jaeyoung Lee, Qing Cai, Yina Wu, and Kali Carroll (2019). Exploring Safety Impacts of Geometric and Signage Designs at Hybrid Toll Plazas. Transportation Research Board 98th Annual Meeting, Submitted.
- Abdel-Aty, Mohamed. Keynote speech, Traffic Safety Improvement in USA, The 6th International Symposium on Transportation Safety, Shanghai, May 2018
- Abdel-Aty, Mohamed. “Safety Implications of Connected-Autonomous Vehicles (CAV)”, International Symposium of Accident Analysis and Prevention, Changsha, China, September 2018.
- Abdel-Aty, Mohamed. “Implementation of Ramp Metering to Improve Safety of Congested Expressway Weaving Segments”, Road Safety on 5 Continents, Jeju, South Korea, May 16-18, 2018.
- Abdel-Aty, Mohamed. “Exploring Microscopic Crash Mechanisms of Freeway-to-Freeway Interchange Ramps”, Road Safety on 5 Continents, Jeju, South Korea, May 16-18, 2018.
- Fournier, N., Campbell, N., Bakhtiari, S., Valluru, K.D., Wolfgram, J., Christofa, E., Knodler, M., and Ganz, A. 2018. Dynamic signage for visually impaired pedestrian safety at roundabout crossings, 98th Transportation Research Board Annual Meeting. [submitted]
- Moatz Saad, Mohamed Abdel-Aty, Jaeyoung Lee, and Ling Wang (2018). Fusion Of Safety And Operation Analysis For Toll Managed Lanes Access Design. ITS World Congress, Accepted.
- Iman Farhat, Kelvin Santiago, Madhav Chitturi, David Noyce. Examining the effects of augmented reality traffic signs on driver’s performance and distraction,. Transportation Research Board 98th Annual Meeting. [Submitted].
- Ryan, A., (2018). “Alternative Merge Design Downstream of Intersections: Experimental Signage” ITE International and Midwestern/Great Lakes Districts Annual Meeting and Exhibit, Minneapolis, MN.

- Abdel-Aty, Mohamed. “Integrated Freeway/Arterial Active Traffic Management (IATM), Reduced Visibility, CAV”, Seminar, Tongji University, China, September 2018.
- Lee, Jaeyoung. “Recent Traffic Safety Research Trends”, Central South University, August 2018.
- Lee, Jaeyoung. “Innovative Intersection Designs in the United States”, Beijing Jiaotong University, May 2018.
- Lee, Jaeyoung. “Macroscopic and Mesoscopic Analyses of Crash Data: Recent Applications”, Beijing Jiaotong University, May 2018.
- Lee, Jaeyoung. “Analyzing Emergency Medical Services Times”, Central South University, May 2018.
- Lee, Jaeyoung. “Alternative Intersections: Designs and Operations”, Changsha University of Science and Technology, May 2018.
- Gonzales, Eric. “Safety Evaluation of Urban Freight Deliveries using Microsimulation and Surrogate Safety Measures”. Northwestern University, April 2018
- Fitzpatrick, Cole. “Examining Distracted Drivers' Underestimation of Time and Overestimation of Speed”. Oregon State University, May 2018.

#### *Website(s) or other Internetsite(s)*

- <http://safersim.nads-sc.uiowa.edu/> - Center’s website containing descriptions of research projects and final reports, news articles about our work, contact information, and other important information related to the center. The website is updated regularly with news stories and outreach events. Traffic measures from the website are below:
  - 1437 total users, 1412 of those being new
  - 2235 sessions
  - 7608 page views
- [https://www.youtube.com/channel/UCe8cN3jX8\\_mkAf8d8-UPzKQ](https://www.youtube.com/channel/UCe8cN3jX8_mkAf8d8-UPzKQ) - Center’s YouTube channel containing webinar presentations and other videos related to our work. YouTube Analytics from this period are below:
  - 10 videos added
  - 577 views
  - +5 subscribers

#### *Technologies or techniques*

- Automated driving software developed in a study at the University of Iowa will be used in upcoming projects with commercial partners Toyota and Aisin
- Scenario creation techniques developed and used in a University of Wisconsin project were recently included as part of a proposal submitted to the Minnesota DOT

### *Inventions, patent applications, and/or licenses*

Nothing to report

### *Other products*

- The Global Road Safety Course developed during this grant was taught this period at the University of Iowa to eight undergraduate students

## **3. Participants & Collaborating Organizations**

### *Organizations that have been involved as partners*

Descriptive text here...

#### Financial Support

8 organizations have provided match funding for research projects

- Federal Highway Administration
- Florida DOT
- Massachusetts DOT
- Wisconsin DOT
- Puerto Rico DOT
- Aisin
- Toyota

#### In-kind Support

6 organizations provided in-kind support through the organization of outreach events

- Southeast Iowa STEM Region
  - Iowa City STEAM Fest (4/15/18)
  - Anamosa STEM Festival (4/26/18)
  - Jefferson County STEM Festival (4/26/18)
  - Johnson County Fair STEM Day (7/24/18)
  - Iowa State Fair – (8/19/18)
- Kirkwood Community College
  - Rollin Rally (6/23/2018)
  - Workplace Learning Connection – Solon Mock Interviews (4/17/18), Regina Mock Interviews (5/4/18)
- City of Fairfield, Iowa – Barnyard Bash (6/22/18)
- STEM Innovator – Student Pitch Day (5/1/18)
- South Slope – Company safety presentation (5/23/18)

- Hyundai Motor Group

#### Facilities

2 schools in Iowa shared their facilities with center staff for outreach events

- Bettendorf Middle School (4/2/18)
- Prairie Ridge Elementary (4/20/18)

#### Personnel exchange

3 SAFER-SIM sites were involved with personnel changes.

- Student from UPR worked at UM over the summer
- Student from University of Arkansas worked at UW over the summer
- Metropistas, LLC

#### *Other collaborators involved*

A main focus of SAFER-SIM UTC has been collaboration, both within consortium sites and across disciplines. Consortium members engaged 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 participated in a conference call once a month to share information about the progress at each university.

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 created a collaborative environment to address safety issues from different perspectives.

Some backgrounds include:

- Civil Engineering
- Industrial Engineering
- Computer Science
- Psychology & Brain Sciences
- Public Health
- Pharmacy
- Emergency Medicine
- Science Education
- Orthopedic Surgery

SAFER-SIM researchers also collaborate with contacts outside the UTC and in some instances outside the country. Presentations this period to contacts outside SAFER-SIM include:

- Tongji University, China, September 2018
- Central South University, August 2018
- Beijing Jiaotong University, May 2018

- Central South University, May 2018
- Changsha University of Science and Technology, May 2018
- Northwestern University, April 2018
- Oregon State University, May 2018

#### **4. 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. The 43 projects funded by the center will impact

- Safety evaluations
- Roadway design
- Traffic operations
- Vulnerable road users
- Planning
- In-vehicle 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. During this reporting period:

- 7 peer reviewed publications
- 12 conference presentations and papers
- 32 panels and advisory committees
- 27 journals reviewed
- 6 journal editorships

##### *Education and Workforce Development Impact*

The impact of SAFER-SIM education and development has generated curiosity in students and employees in the transportation industry that will lead to advanced innovations and improved safety. During this reporting period:

- 3 students received degrees in transportation disciplines
- 2 students found employment
- 1474 students and community members engaged

##### *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.

During this reporting period:



- 10 project technical reports were published
- 10 webinars – 121 attendees, 285 views on YouTube

#### *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.

During this reporting period:

- 2 collaborative project completed

#### *Program Efficacy Impact*

The impact of SAFER-SIM program efficacy will lead to continued funding of the center and the University Transportation Center Program. 43 projects were funded by this grant. 43 projects completed.

#### *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. During this period:

- 3 diversity events
- 110 attendees

### **5. Changes/Problems**

No changes or problems to report.

### **6. Special Reporting Requirements**

No special reporting requirements.