SAFER-SIM Accomplishments

April 1, 2021 – September 30, 2021

1. Accomplishments

1.1 Research Accomplishments

1.1.1 Peer-reviewed journal publications

Published

1. B. Claros. “Impact of Geometry and Operations on Left Turn Gap Acceptance at Signalized Intersections with Permissive Indication” Transportation Research Record. May 2021. http://dx.doi.org/10.1177/03611981211011476
2. Guo, Z., Afifah, F.∗, Qi, J, and Baghali, S., A Stochastic Multi-Agent Optimization Framework for Interdependent Transportation and Power System Analyses. IEEE Transactions on Transportation Electrification. September 2021. https://doi.org/10.1109/TTE.2021.3049127
3. Rahman, R., Hasan, S. and Zaki, M. H. Towards reducing the number of crashes during hurricane evacuation: Assessing the potential safety impact of adaptive cruise control systems. Transportation Research Part C: Emerging Technologies, 128, 103188. July 2021. https://doi.org/10.1016/j.trc.2021.103188
4. Rahman, R., Bhowmik, T., Eluru, N., and Hasan, S. Assessing the crash risks of evacuation: A matched case-control approach applied over data collected during Hurricane Irma. Accident Analysis and Prevention, 159, 106260. September 2021. https://doi.org/10.1016/j.aap.2021.106260
5. Gaspar, J., Carney, C., Shull, E., and Horrey, W. Mapping drivers’ mental models of adaptive cruise control to performance. Transportation Research Part F: Traffic Psychology and Behaviour. August 2021. https://doi.org/10.1016/j.trf.2021.07.012
6. Subramanian, L. D., O’Neal, E. E., Roman, A., Sherony, R., Plumert, J. M., & Kearney, J. K. (in press). How do pedestrians respond to adaptive headlamp systems in vehicles? A road-crossing study in a virtual environment. Accident Analysis and Prevention. September 2021. https://doi.org/10.1016/j.aap.2021.106298
7. A. Fallahdizcheh and C. Wang, "Profile monitoring based on transfer learning of multi-profile with incomplete samples," IISE Transanctions, May 2021. https://doi.org/10.1080/24725854.2021.1912439
8. Deliali, K., Christofa, E., & Knodler Jr, M. (2021). The role of protected intersections in improving bicycle safety and driver right-turning behavior. Accident Analysis & Prevention, 159, 106295. September 2021. https://doi.org/10.1016/j.aap.2021.106295
9. Roberts, S. C., Zhang, F., Fisher, D., & Vaca, F. E. (2021). The effect of hazard awareness training on teen drivers of varying socioeconomic status. Traffic Injury Prevention, 22(6), 455-459. July 2021. https://doi.org/10.1080/15389588.2021.1940984
10. B. Colucci, A. Medina and D. Díaz, INNOVATIVE RESEARCH THAT CONTRIBUTES TO SAFETY, SUSTAINABILITY AND RESILIENCE IN TRANSPORTATION SYSTEMS, RIDNAIC (2021). Vol. 19-20, 13 URL https://www.scipedia.com/public/Colucci_et_al_2021a

Accepted for publication

1. Amin Vahedian Khezerlou, Xun Zhou, Xinyi Li, W. Nick Street, Yanhua Li. DILSA+: Predicting Urban Dispersal Events Through Deep Survival Analysis with Enhanced Urban Features. In ACM Transactions on Intelligent Systems and Technology (TIST), accepted.
2. Yiqun Xie, Xiaowei Jia, Shashi Shekhar, Han Bao and Xun Zhou. Significant DBSCAN+: Statistically Robust Density-based Clustering. In ACM Transactions on Intelligent Systems and Technology (TIST), accepted.
3. Han Bao, Xun Zhou, Yiqun Xie, Yingxue Zhang, Yanhua Li. COVID-GAN+: Estimating Human Mobility Responses to COVID-19 through Spatio-Temporal Generative Adversarial Networks with Enhanced Features. In ACM Transactions on Intelligent Systems and Technology (TIST), accepted.
4. Yingxue Zhang, Yanhua Li, Xun Zhou, Jun Luo, and Zhi-Li Zhang. Urban Traffic Dynamics Prediction -- A Continuous Spatial-Temporal Meta-Learning Approach.. In ACM Transactions on Intelligent Systems and Technology (TIST), accepted.
5. Kasarla, P., Wang, C., Brown, T. L., & McGehee, D. (2021). Modeling and prediction of driving performance measures based on multi-output convolutional Gaussian process. Accident Analysis & Prevention, 161, 106360. October 2021. https://doi.org/10.1016/j.aap.2021.106360
6. O'Neal, E. E., Rahimian, P., Jiang, Y., Zhou, S. Nikolas, M., Kearney, J. K., & Plumert, J. M. (in press). How do child ADHD symptoms and oppositionality impact parent-child interactions when crossing virtual roads? Journal of Pediatric Psychology. October 2021. https://doi.org/10.1093/jpepsy/jsab102
7. Parr, M. N., Tang, H., Mallaro, S., Kearney, J., & Plumert, J. M. Do Inattention/Hyperactivity and Motor Timing Predict Children's Virtual Road-Crossing Performance?. Journal of Pediatric Psychology. October 2021. https://doi.org/10.1093/jpepsy/jsab054
8. McGehee, D., Roe, C., Kasarla, P., & Wang, C. (2021). Quantifying and recommending seat belt reminder timing using naturalistic driving video data. Journal of Safety Research
9. Parathasarathy, A. R., Mehrotra, S., Fitzpatrick, C., Roberts, S. C., Christofa, E., & Knodler, M. A. (in press). Driver behavior and performances on in-vehicle display based speed compliance. Accident Analysis and Prevention. November 2021. https://doi.org/10.1016/j.aap.2021.106390

Submitted

1. Wang, Z., Yue, L*., Abdel-Aty, M., Zhu, J., Zheng, O., & Zaki, M. Cooperative Driving at Non-Signalized Intersection in a Mixed Traffic Environment: A Co-Simulation Based Multi-Driver Driving Simulator Study (under review by Transportation Research Part C)
2. Effects of Connected and Autonomous Vehicle Merging Behavior on MainLine Human Driven Vehicle, Lishengsa Yue, Mohamed Abdel-Aty, Zijin Wang, under review by Journal of Intelligent & Connected Vehicles
3. Subramanian, L. D., O'Neal, E. E., Mallaro, S., Williams, B., Sherony, R., Plumert, J. M., & Kearney, J. K. (2021). A comparison of daytime and nighttime pedestrian road-crossing using an immersive virtual environment. Manuscript submitted for publication.
4. Rahimian, P., Plumert, J. M., & Kearney, J. K. (2021). The effect of visuomotor latency

on steering behavior in virtual reality. Manuscript submitted for publication.
5. Song, Y., Chitturi, M.V. and Noyce, D.A. A Methodology for Traffic Crash Sequence Analysis: Impact of Event Encoding and Dissimilarity Measures. Accident Analysis & Prevention (Under Review)

1.1.2 Book chapters

1. Yanhua Li, Xun Zhou, Menghai Pan. Graph Neural Networks in Urban Intelligence. Chapter in "Graph Neural Networks: Foundations, Frontiers, and Applications" (Eds. L. Wu, P. Cui, J. Pei, and L. Zhao), Springer, pp 1--720, July 2021.

1.1.3 Edited books

Nothing to report

1.1.4 Conference papers, posters, and symposia

Presented

1. Alberto Figueroa-Medina, Didier Valdés, Benjamín Colucci, Natacha Cardona, and Andrés Chamorro. September 2021. Pedestrian Walking speeds and Success Rates on Mid-Block Crossing Using Virtual Reality Simulation. Road Safety and Simulation Conference 2021.
2. Carla Lopez, Didier Valdés, Alberto Figueroa, and Benjamín Colucci. Driver's Compliance in Work Zones: Two-Lane Rural Roads -vs.- Freeways. 2021 International LADR Workshop. 2021.
3. Ryan, A., Ai, C., Fitzpatrick, C., and Knodler, M. Identifying safety-critical road segments and potential countermeasures: A geospatial approach using horizontal curve data. To present at the Institute of Transportation Engineers Annual Meeting, 18–21 July, Portland, OR.
4. Ryan, A., Hennessy, E., Ai, C., Fitzpatrick, C., and Knodler, M. Driver performance at horizontal curves: Bridging critical research gaps to increase safety. Paper Number 7. Road Safety & Simulation International Conference, 22–24 September, Athens, Greece.
5. Horrey, W. J., Benson, A., Guo, Z., Afifah, F., Hamann, C. J., & Santiago, K. R. (2021). Expectations and Understanding of Advanced Driver Assistance Systems Among Drivers, Pedestrians, Bicyclists, and Public Transit Riders. Proceedings of the Road Safety and Simulation International Conference. Vol 16, p.19. 06/2021
6. Gaspar, J., Carney, C., Shull, E., and Horrey, W. Mapping mental model accuracy and system exposure to driver behavior. Human Factors and Ergonomics Society Annual Meeting 2021.
7. Malik, J., Parr, M. D. N., Flathau, J., Tang, H., Kearney, J. K., Plumert, J. M., & Rector, K. (2021). Determining the effect of smartphone alerts and warnings on the street-crossing behavior of non-mobility-impaired older and younger adults. In CHI Conference on Human Factors in Computing Systems (CHI ’21), May 08–13, 2021, Yokohama, Japan. ACM, New York, NY, USA, 12 pages. https://doi.org/10.1145/3411764.3445234
8. O’Neal., E.E., Tang, H., Flathau, J., & Plumert, J.M. (April, 2021). How does parent gender impact the socialization of safety values in sons and daughters? Poster presented at

the 2021 biennial meeting of the Society for Research in Child Development (online).

9. Parr, M., Zhou, S., O'Neal, E.E., Kearney, J.K., & Plumert, J.M. (April, 2021). How do Children Perceive and Act on Affordances When Walking vs Bicycling Across Roads? Poster presented at the 2021 biennial meeting of the Society for Research in Child Development (online).
10. Kim, A., O'Neal, E.E., Flathau, J., Tang, H., Kearney, J.K., & Plumert, J.M. (April, 2021). A parent-based intervention program for training prospective control skills in children. Poster presented at the 2021 biennial meeting of the Society for Research in Child Development (online).
11. O'Neal, E.E., Tang, H., Flathau, J., & Plumert, J.M. (April, 2021). Socialization of safety values in children: The role of parent and child gender. Oral presentation at the 2021 annual meeting of the Society for Violence and Injury Research (online).
12. Ryan, A., Christofa, E., Barchers, C., and Knodler, M. (2021). Towards equitable road safety: Socio-demographic divides in municipal highway investments. Conference on Advancing Transportation Equity (CATE), September 2021.
13. Benjamín Colucci. Technical Poster entitled Lessons Learned and Future of the Decade of Action for Road Safety 2011-2020, Strategic Highway Safety Plans and Vision Zero Initiatives presented with Eng. Lynnette Alicea from CSA Group during the ITE 2021 Virtual Annual Meeting. August 13, 2021.

<u>Accepted/Not yet presented</u>

1. Yiqun Xie, Erhu He, Xiaowei Jia, Han Bao, Xun Zhou, Rahul Ghosh and Praveen Ravirathinam. A Statistically-Guided Deep Network Transformation and Moderation Framework for Data with Heterogeneity. In Proc. IEEE International Conference on Data Mining (ICDM'21), Auckland, New Zealand, Nov. 7-10, 2021 (accepted)
2. Xin Zhang, Yanhua Li, Xun Zhou, Oren Mangoubi, Ziming Zhang, Vincent Filardi, and Jun Luo, DAC-ML: Domain Adaptable Continuous Meta-Learning for Urban Dynamics Prediction. In Proc. IEEE International Conference on Data Mining (ICDM'21), Auckland, New Zealand, Nov. 7-10, 2021 (accepted).
3. Yingxue Zhang, Yanhua Li, Xun Zhou, Zhenming Liu, and Jun Luo. C3-GAN: Complex-Condition-Controlled Urban Traffic Estimation through Generative Adversarial Networks In Proc. IEEE International Conference on Data Mining (ICDM'21), Auckland, New Zealand, Nov. 7-10, 2021. (accepted)
4. Menghai Pan, Xin Zhang, Yanhua Li, Xun Zhou and Jun Luo. Learning Decision Making Strategies of Non-experts: A NEXT-GAIL Model for Taxi Drivers. In Proceedings of the ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (SIGSPATIAL'21), 2021. (accepted)
5. Yiqun Xie, Xiaowei Jia, Han Bao, Xun Zhou, Jia Yu, Rahul Ghosh and Praveen Ravirathinam. Spatial-Net: A Self-Adaptive and Model-Agnostic Deep Learning Framework for Spatially Heterogeneous Datasets. In Proceedings of the ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (SIGSPATIAL'21), 2021. (accepted).
6. Figueroa-Medina, D. Valdés, B. Colucci, N. Cardona & A. Chamorro. 2022. Pedestrian Walking Speeds and Success Rates on Mid-Block Crossings using Virtual Reality Simulation. Abstract accepted for Road Safety and Simulation Conference (RSS 2022),

Athens, Greece.

7. Alberto Figueroa-Medina, Didier Valdés, Benjamín Colucci, Natacha Cardona, and Andrés Chamorro. September 2021. Pedestrian Walking speeds and Success Rates on Mid-Block Crossing Using Virtual Reality Simulation. Abstract accepted for Road Safety and Simulation Conference 2021.

Submitted

1. Figueroa-Medina, D. Valdés-Díaz, B. Colucci-Ríos, N. Cardona-Rodríguez & A. Chamorro-Parejo. 1-2022. Evaluation of Road Crossing Events with Pedestrians Using a Road Information Assistive System in a Virtual Reality Experiment. Submitted for presentation and publication at 101st TRB Annual Meeting, Washington, D.C.
2. Horrey W.J, Benson A., Guo Z., Afifah F., Hamann C., and K. Santiago. Understanding of advanced driver assistance systems: A comparison of drivers and other road users. Submitted to the 2022 Transportation Research Board Annual Meeting.
3. Malik, J., Kim, N. Y., Parr, M. D. N., Kearney, J. K., Plumert, J. M., & Rector, K. (2021). Do simulated augmented reality overlays influence street-crossing decisions in non-mobility-impaired older and younger adults? Submitted for publication.

1.1.5 Paper/poster awards

Nothing to report

1.1.6 External grants related to SAFER-SIM

Awarded

1. EAGER-SAI: Exploring Pathways of Adaptive Infrastructure Management with Rapidly Intensifying Hurricanes
   Sponsor: National Science Foundation
   Amount: $140,000
   Duration: September 1, 2021-August 31, 2022
   Crash data analysis done under the SAFER-SIM project significantly helped to write the proposal for this project which will extend the analysis for a rapidly intensifying hurricane.
2. Elizabeth O'Neal received K99 Award from the National Institute of Child Health and Human Development
3. Eleni - Effectiveness of Bicycle Boxes in Massachusetts, Massachusetts Department of Transportation
4. Eleni - Building a Bicycle Simulator to Study Bicyclist-Connected & Automated Vehicle Interactions, Robert B. Brack Endowment funds for research (UMass)
5. Pradhan & Roberts - A Pilot Usability & Efficacy Evaluation of Hazard Anticipation-Attention Maintenance (HAAM) Training, Toyota Collaborative Safety Research Center, $150,000, 07/15/2021-02/28/2022
   The objective of this grant is to conduct an experimental evaluation of a hazard anticipation training program for novice teen drivers. The new proposal is very

similar to this SaferSim work as they both focus on developing and evaluating a driver training program that relies on active training and the 3M approach – mistake, mitigation, and mastery.

Submitted

1. "Parental Scaffolding of Children's Prospective Control in Dynamic Perception-Action Tasks" Jodie Plumert (PI), Joseph Kearney (Co-PI), Kyle Rector (Co-PI). Grant application submitted to the National Science Foundation.
2. Shannon Roberts - CAREER: AUTOMATE – Advancing Underrepresented Groups Travel Opportunities by Mobilizing Automated Vehicle Technology for Equity, National Science Foundation, $578,000, 09/01/2022-08/31/2027, PI.
   This proposal seeks to establish and evaluate human machine interface design principles that positively influence marginalized occupants' perception, engagement, and interaction with driving automation systems. This proposal naturally extends this current SaferSim work by applying it to a more diverse group of drivers.
3. Roberts - REU Site: RIDE - Research for Inclusivity and Driving Equity, National Science Foundation, $400,000, 01/01/2022-12/31/2024, PI.
   This proposal seeks to engage a diverse pool of undergraduate students in community-engaged transportation research. With the proposal, Prof. Roberts will work with undergraduate students on research projects that are similar to and even build off of this SaferSim project.
4. Roberts - SaTC: CORE: Medium: DRIVE - Decreasing cybersecurity Risk In Vehicles for law Enforcement, National Science Foundation, $1,200,000, 01/01/2022-12/31/2025, PI.
   This proposal seeks to establish and evaluate an evidence-based conceptual model that examines and enhances LEO knowledge of vehicle cybersecurity risk and resiliency. Through the proposal, Prof. Roberts will work with collaborators to develop a training program for law enforcement that will be of a similar format to this SaferSim project (e.g., understand how drivers respond to unexpected vehicle behavior).
5. NCHRP Proposal Project Number 17-100: Leveraging Artificial Intelligence and Big Data to Enhance Safety Analysis (Christofa, Knodler)

1.2 Leadership Development Accomplishments

1.2.1 Invited presentations

1. Dr. Mohamed Abdel-Aty: USDOT Webinar, Crash Prediction for Expedited Detection (CPED), August 2021.
2. Dr. Mohamed Abdel-Aty: Delivering the Next Generation Roads Using Active Traffic Management Technology, Keynote, Road to Tomorrow R2T Virtual Conference, International Road Federation, July 2021.
3. Dr. Mohamed Abdel-Aty: Real-Time Crash Risk Visualization Tool for Traffic Safety Management, Maryland Distraction Summit, April 2021.
4. Dr. Samiul Hasan, Central Northeast Florida ITE Webinar, August 18, 2021. Title: Assessing the Safety Impacts of Evacuation Traffic: A Case Study of Hurricane Irma. Number of attendees: 35

5. Mohamed H. Zaki. Proactive Diagnosis of Traffic Safety: From Data to Formalization (Invited Talk) CICM 2021: 14TH CONFERENCE ON INTELLIGENT COMPUTER MATHEMATICS
6. Xun Zhou gave a talk at the Geographical and Sustainability Sciences Department at University of Iowa.
7. Rector, K. Pathways for PhD's: A Panel Hosted by Google, CMD-IT/ACM Richard Tapia Celebration of Diversity in Computing Conference, September 16, 2021.
8. Rector, K. Research in Accessible XR, XRAccess Symposium, Cornell Tech and Verizon, June 2021.
9. 2021 XR Impact on Driving Simulation ADAS and User Behavior, Driving Simulation Conference, Round Table, J. Oliver, Jean-Rémy Chardonnet, J. K. Kearney, E. Theisinger, Sergej Holzmann, Bert Hartfiel, & Stephane Regnier.
10. Kearney, J.K. & Plumert, J.M., Obermann Center Summer Institute on Cross-Disciplinary Graduate Education, 6/9/2021.
11. Anuj Pradhan, panelist at the 2021 Forum on Impact of Vehicle Technologies and Automation on Users.
12. John Gaspar, panelist at the 2021 Forum on Impact of Vehicle Technologies and Automation on Users.
13. A. Figueroa-Medina. May 19, 2021. Desempeño de Velocidad y Evaluación del Diseño de Carreteras (Speed Performance and Road Design Assessment). Session “Consiguiendo Velocidades Seguras” at Virtual Conference “Visión Cero Accidentes Fatales para América Latina”, International Road Federation (IRF) Global.
14. A. Figueroa-Medina. July 6, 2021. Transportación y Seguridad Peatonal (Transportation and Pedestrian Safety). Talk to high school students at the 2021 Summer Transportation Institute (STI), UPR Mayaguez, Department of Civil Engineering and Surveying.
15. D. Valdés-Díaz, A. Figueroa-Medina, and B. Colucci Rios. July 15, 2021. Research in Civil Engineering related to the SAFER-SIM project. Presented at the PR Department of Transportation Week. San Juan, PR.
16. D. Valdés-Díaz. June 17, 2021. Introducción al Análisis de Sistemas de Transportación (Introduction to Transportation Systems Analysis). Talk to high school students at the 2021 Summer Transportation Institute (STI), UPR Mayaguez, Department of Civil Engineering and Surveying.
17. D. Valdés-Díaz. May 18, 2021. Strategies to Reduce Speed for Safety: Simulation and Vision Zero. Virtual Conference “Visión Cero Accidentes Fatales para América Latina”, International Road Federation (IRF) Global.
18. B. Colucci-Ríos. April 13, 2021. Transportación y Carreteras en el Contexto Urbano (Transportation and Streets in the Urban Context). Virtual Talk to graduate students of the Urban Environment and Urbanism Course, University of Puerto Rico Graduate School of Planning, Río Piedras Campus.
19. B. Colucci-Ríos. April 28, 2021. Vision of the College of Engineers and Surveyors of Puerto Rico (CIAPR): Mobility and Transportation Commission. Session Next Generations, Next Challenges: Federal, State and ITE Vision, Institute of Transportation Engineers (ITE)-Puerto Rico Section Virtual Spring Meeting.
20. B. Colucci-Ríos, and J. Cruz Martínez. May 19, 2021. Sistemas Inteligentes de Transporte (SIT): Historias Exitosas de Guías Positivas para Usuarios de Carreteras en Puerto Rico (Intelligent Transportation Systems (ITS): Success Stories of Positive Guidance for Road

Users in Puerto Rico). Session “Entrega de guías positivas para usuarios carreteros” at Virtual Conference “Visión Cero Accidentes Fatales para América Latina”, International Road Federation (IRF) Global.
21. B. Colucci-Ríos. June 17, 2021. Corridor-Wide Surveillance Using Unmanned Aircraft Systems. National Institute for Congestion Reduction (NICR) Webcast. A webinar presented to researchers, undergraduate, and graduate research assistants.
22. B. Colucci-Ríos. June 25, 2021. Infrastructure 2030: Challenges and Opportunities for Engineers and Surveyors in the Transportation Area. Keynote speaker at the 20th Anniversary Conference of the Foreign Chapter of the College of Engineers and Surveyors of Puerto Rico (CIAPR). Orlando, Florida.
23. B. Colucci-Ríos. July 6, 2021. Seguridad en las Carreteras: Compromiso del País (Highway Safety: A Country Commitment). Talk to high school students at the 2021 Summer Transportation Institute (STI), UPR Mayaguez, Department of Civil Engineering and Surveying.
24. B. Colucci-Ríos. July 16, 2021. Freeway Corridor Surveillance Using Unmanned Aircraft Systems. 2021 Mega Civil Friday (MVC) as part of the NICR-UPRM Group, Puerto Rico Convention Center. San Juan, PR.
25. B. Colucci-Ríos. July 22, 2021. The Impacts of COVID-19 in the Transportation System of Puerto Rico in the Middle of Recovery of Hurricanes and Earthquakes Natural Disasters. Institute of Transportation Engineers (ITE) 2021 Annual Virtual Meeting.
26. B. Colucci-Ríos. August 31, 2021. CIAPR Infrastructure 2030: Mobility and Transportation Commission. Puerto Rico Reconstruction Council, Department of State.
27. B. Colucci-Ríos. September 16, 2021. Sustainable and Resilient Design of the Main Elements of the Highway. Session “The Reconstruction of the Puerto Rico Road System” virtual talk to professional engineers. Fundraising for Engineer Luis M Carrillo, Jr. Scholarship sponsored by “Sociedad de Ingenieros de Puerto Rico” (SIPR); Puerto Rico Engineers Society.
28. Presentation to Milliman Insurance on “CAVs” – June 24, 2021 - Riehl
29. Presentation to Public Risk Management Association on “CAVs” – June 14, 2021 – Riehl

1.2.2 Invited papers

Nothing to report

1.2.3 Invited workshops

1. Xun Zhou Co-organized the 2nd Workshop on Deep Learning for Spatial Data, Applications and Systems (DeepSpatial) at ACM SIGKDD Conference 2021.
2. Plumert, J. M. (July, 2021). Faculty Communications Workshop

1.2.4 Grant review panels

1. National Science Foundation Panel 2021 (Rector)
2. Shannon Roberts served on an NSF proposal review panel.
3. Shannon Roberts continues to serve on a BTSCRP panel for BTS-01: Guidance for Employer-Based Behavioral Traffic Safety Programs for Drivers in the Workplace. For

the panel, she provided guidance for the contractor in terms of how drivers will respond to traffic safety programs.
4. Luxembourg National Research Fund (FNR) CORE programme [not a panel] (Christofa)
5. Freight Mobility Research Institute (FMRI) [not a panel] (Christofa)
6. Alberto Figueroa-Medina. Member of Oversight Panel for NCHRP project 07-29: Development of the 8th edition of the AASHTO's A Policy on Geometric Design of Highways and Streets (Green Book). National Cooperative Highway Research Program, Transportation Research Board.

1.2.5 Advisory committees

1. Dr. Mohamed Abdel-Aty: Transportation Research Board, National Research Council, National Academy of Sciences
2. Dr. Mohamed Abdel-Aty: Member, Committee on Safety Performance and Analysis (ACS20) – MEMBER (2014- 2021)
3. Dr. Mohamed Abdel-Aty: Member, Committee on Human Factors of Infrastructure Design and Operations (ACH40) – MEMBER (1998 – 2002, 2004 –2011 and 2014-2021)
4. Dr. Mohamed Abdel-Aty: Co-Chair, ASCE Transportation Safety Committee, Nov. 2017-ongoing
5. Dr. Mohamed Abdel-Aty: Member, World Conference on Transport Research Society – WCTRS (2004 – ongoing)
6. Dr. Mohamed Abdel-Aty: Member, Editorial Board, ITS Journal, Taylor & Francis (2003 – ongoing)
7. Dr. Mohamed Abdel-Aty: Member, Editorial Board, International Journal of Sustainable Transportation, Taylor & Francis (2013 – ongoing).
8. Dr. Mohamed Abdel-Aty: Member, Editorial Board, Analytic Methods in Accident Research (AMAR) (2019- ongoing)
9. Dr. Mohamed Abdel-Aty: Member, Editorial Board, Transportation Research Part C (2019- ongoing)
10. Dr. Mohamed Abdel-Aty: ITF Roundtable on Artificial Intelligence in Road Traffic Crash Prevention, OECD, Feb. 10-12, 2021
11. Dr. Mohamed Abdel-Aty: Member International Road Federation Group of Experts on Road Safety (2011-ongoing)
12. Dr. Mohamed Abdel-Aty: Member, American Society for Engineering Education – ASEE (2002-2004 and 2010 - ongoing)
13. Dr. Mohamed Abdel-Aty: Board of Directors, National Safety Council (2021-2023)
14. Dr. Mohamed Abdel-Aty: ITF Roundtable on Artificial Intelligence in Road Traffic Crash Prevention, OECD, 2021
15. Dr. Yina Wu: Member, TRB Committee on Surface Transportation Weather (AH010) (2020 – ongoing)
16. UI Injury Prevention Research Center Executive Committee (Reyes)
17. UI Great Plains Center for Agricultural Health Internal Advisory Committee (Reyes)
18. Engineering Staff Advisory Council (Reyes)
19. Transportation Research Board of the National Academies: Standing Committee on Vehicle User Education, Training, and Licensing; and Young Driver Subcommittee, Member (Reyes)
20. Shannon Roberts is on the Center for Research on Families Steering Committee.

21. Shannon Roberts is on the Internal Advisory Board for the Institute of Diversity Sciences
22. TRR Editorial Board Task Force (Christofa)
23. Didier Valdés-Díaz, Applied Human Factors and Ergonomics (AHFE 2017-Present) Scientific Advisory Board.
24. Benjamín Colucci-Ríos, Applied Human Factors and Ergonomics (AHFE 2017-Present) Scientific Advisory Board.
25. Benjamín Colucci-Ríos, Member TRB Committee AHB55 Work Zone Traffic Control.
26. Benjamín Colucci-Ríos, Member Best Paper Award TRB Committee AHB55 Work Zone Traffic Control.
27. Benjamín Colucci-Ríos, Member of the Advisory Committee of the Puerto Rico - State Transportation Innovation Council (STIC).
28. Benjamín Colucci-Ríos, Member of the Advisory Committee of the US Virgin Islands - State Transportation Innovation Council (STIC).
29. Benjamín Colucci-Ríos, 2021 Latin American and Caribbean Consortium of Engineering Institution (LACCEI) International Multi-Conference for Engineering, Education, and Technology Scientific Advisory Board.
30. Benjamín Colucci-Ríos, Transportation Research Board Representative of University of Puerto Rico at Mayaguez, 1985 - Present.
31. Benjamín Colucci-Ríos, Friend, TRB Standing Committee AKC60 Asphalt Pavement Construction and Rehabilitation, 2020 - Present.
32. Benjamín Colucci-Ríos, Friend, TRB Standing Committee ACH40 Human Factors of Infrastructure Design and Operations, 2020 - Present.
33. Benjamín Colucci-Ríos, Friend, TRB Standing Committee AKP10 Pavement Condition Evaluation, 2020 - Present.
34. Benjamín Colucci-Ríos, Friend, TRB Standing Committee AKT30 Pavement Maintenance, 2020 - Present.
35. Benjamín Colucci-Ríos, Friend, TRB Standing Committee AKT10 Pavement Management Systems, 2020 - Present.
36. Benjamín Colucci-Ríos, Friend, TRB Standing Committee AKT20 Pavement Preservation, 2020 - Present.
37. Benjamín Colucci-Ríos, Friend, TRB Standing Committee ACH10 Pedestrians, 2020 - Present.
38. Benjamín Colucci-Ríos, Friend, TRB Standing Committee AJE35 Research Innovation Implementation Management, 2020 - Present.
39. Benjamín Colucci-Ríos, Member, TRB Standing Committee ACH50 Road User Measurement and Evaluation, 2020 - Present.
40. Benjamín Colucci-Ríos, Friend, TRB Standing Committee ACS20 Safety Performance and Analysis, 2020 - Present.
41. Benjamín Colucci-Ríos, Member, TRB Standing Committee ACP55 Traffic Control Devices, 2020 - Present.
42. Benjamín Colucci-Ríos, Friend, TRB Standing Committee AJE30 Transportation Asset Management, 2020 - Present.
43. Benjamín Colucci-Ríos, Friend, TRB Standing Committee ACS10 Transportation Safety Management Systems, 2020 - Present.
44. Benjamín Colucci-Ríos, Friend, TRB Standing Committee AJE15 Workforce Development and Organizational Excellence, 2020 - Present.

45. Benjamín Colucci-Ríos, Co-Chair of the Traffic Enforcement Committee, International Road Federation (IRF). 2013 - Present
46. Benjamín Colucci-Ríos, Co-Chair Vision Zero Conference in Latin America Steering Committee, International Road Federation (IRF). 2021
47. Benjamín Colucci-Ríos, Member, Transportation Forensics and Risk Management (T-FARM), Institute of Transportation Engineers (ITE), 2018 – Present.
48. Benjamín Colucci-Ríos, Member, Transportation Education Council, Institute of Transportation Engineers (ITE), 2017 – Present.
49. Benjamín Colucci-Ríos, Member, Transportation Safety Council, Institute of Transportation Engineers (ITE), 2019 – Present.
50. Benjamín Colucci-Ríos, Member of the Executive Committee of the National Institute for Congestion Reduction (NICR), University Transportation Center (UTC). November 2019 - Present.
51. Benjamín Colucci-Ríos, American Association of State Highways and Transportation Officials (AASHTO) Co-Liaison representing the National Local Technical Assistance Program Association (NLTAPA). August 2019 - Present.
52. Benjamín Colucci-Ríos, Partnership Workgroup, representing the National Local Technical Assistance Program Association (NLTAPA). July 2018 - Present.
53. Benjamín Colucci-Ríos, Safety Workgroup representing the National Local Technical Assistance Benjamin Colucci, Innovation, and Implementation Workgroup representing the National Local Technical Assistance Program Association (NLTAPA). July 2018 - Present.
54. Benjamín Colucci-Ríos, Innovation, and Implementation Workgroup representing the National Local Technical Assistance Program Association (NLTAPA). July 2018 - Present.
55. Benjamín Colucci-Ríos, Strategic Highway Safety Plan (SHSP) - Puerto Rico, stakeholder representing Puerto Rico LTAP - T2; Traffic Incident Management (TIM) workgroup, 2013 - Present.
56. Benjamín Colucci-Ríos, President of Transportation and Mobility Commision College of Engineers and Surveyors of Puerto Rico (CIAPR), August 2020 - Present.
57. Benjamín Colucci-Ríos, President of Highway and Transportation Task Force, American Society of Civil Engineers (ASCE) - Puerto Rico Section, June 2020 - Present.
58. Benjamín Colucci-Ríos, American Public Works Association (APWA) representing the Puerto Rico Local Technical Assistance Program (LTAP) Center. June 1, 2020-May 31, 2021.
59. Benjamín Colucci-Ríos, Puerto Rican Academy of Engineering (APrI) Founding Member 2010 - Present.
60. Alberto M. Figueroa-Medina, Standing Committee on Performance Effects of Geometric Design AKD-10 (formerly known as Operational Effects of Geometrics AHB-65), Transportation Research Board, 2013-Present.
61. Alberto M. Figueroa-Medina, Transportation Education Council, Institute of Transportation Engineers (ITE).
62. Alberto M. Figueroa-Medina, Transportation Safety Council, Institute of Transportation Engineers (ITE).
63. Alberto M. Figueroa-Medina, Executive Committee of the National Institute for Congestion Reduction (NICR), University Transportation Center (UTC). Nov. 2019 -

Present.

64. Alberto M. Figueroa-Medina, Technical Committee of the Pan American Federation of Engineers Societies (UPADI), 2020-Present.
65. Dr. Chris Schwarz: TRB committee on vehicle automation
66. Dr. Chris Schwarz: SAE On Road Automated Driving Simulation Task Force
67. Michelle Reyes: UI Injury Prevention Research Center Executive Committee
68. Michelle Reyes: UI Great Plains Center for Agricultural Health Internal Advisory Committee
69. Michelle Reyes: Transportation Research Board of the National Academies: Standing Committee on Vehicle User Education, Training, and Licensing; and Young Driver Subcommittee, Member
70. Michelle Reyes: Engineering Staff Advisory Council
71. Jacob Heiden: Engineering Staff Advisory Council, President
72. Dawn Marshall: Engineering Staff Advisory Council
73. Dawn Marshall: ACH40 Human Factors of Infrastructure Design and Operations
74. Dawn Marshall: ACH40 Joint Subcommittee on Human Factors of In-Vehicle Systems (with ACH30)
75. Kelvin Santiago: City of Sun Prairie Public Works Committee
76. David A. Noyce: Board of Governors (elected), Vice President 2020-2021, President 2021-2022. Transportation & Development Institute, American Society of Civil Engineers.
77. David A. Noyce: Mentor, Chancellor's Scholarship Program, Merit-Based Scholarships for Undergraduate Students from Underrepresented Groups. University of Wisconsin-Madison.
78. David A. Noyce: Chair, Associate Dean for Research Search & Screen Committee. College of Engineering, University of Wisconsin-Madison.
79. David A. Noyce: Member, Undergraduate Student Progression Committee. College of Engineering, University of Wisconsin-Madison.
80. David A. Noyce: Member, Dean's Leadership Council. College of Engineering, University of Wisconsin-Madison.

1.2.6 Journal editing

1. Dr. Mohamed Abdel-Aty: Editor-in-Chief (July 2013 – 2021), Accident Analysis and Prevention, Elsevier.
2. Dr. Mohamed Abdel-Aty: Associate Editor, Transportation Research Interdisciplinary Perspectives (TRIP).
3. Dr. Mohamed Abdel-Aty: Member, Editorial Board, ITS Journal, Taylor & Francis (2003 – ongoing)
4. Dr. Mohamed Abdel-Aty: Member, Editorial Board, International Journal of Sustainable Transportation, Taylor & Francis (2013 – present).
5. Dr. Mohamed Abdel-Aty: Member, Editorial Board, Analytic Methods in Accident Research (AMAR), 2019-present.
6. Dr. Mohamed Abdel-Aty: Member, Editorial Board, Transportation Research Part C, 2019-present
7. Dr. Mohamed Abdel-Aty: Associate Editor, Journal of Transportation Engineering, Part A: Systems, 2021-present

8. Yina Wu: Editorial Board member, Accident Analysis and Prevention, Elsevier.
9. Yina Wu: Guest Editor, Journal of Transportation Engineering, Part A: Systems (special issue: innovation in road safety practice and case studies)
10. Yina Wu: Guest Editor, Sustainability (special issue: Accident Prevention and Risk Management for Safe and Sustainable Transportation)
11. Lishengsa Yue, handling editor (April 2021 – ongoing), Journal of Transportation Research Record
12. Samiul Hasan, Associate Editor, Journal of Big Data Analytics in Transportation
13. Samiul Hasan, Associate Editor, IEEE ITS conference
14. Samiul Hasan, Associate Editor, Highway Transportation System Security and Emergency Response, Journal of Transportation Safety and Security (JTSS)
15. Xun Zhou is co-editing a special issue for “Frontiers in Big Data” on Big Data for Urban Intelligence
16. ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), Associate Editor (Rector)
17. ACM Transactions on Accessible Computing (TACCESS), Reviewer (Rector)
18. ACM CHI Conference on Human Factors in Computing Systems, Reviewer (Rector)
19. ACM SIGACCESS Conference on Computers and Accessibility, Reviewer (Rector)
20. ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), Reviewer (Kearney)
21. IEEE Transaction of Intelligent Vehicles, Reviewer (Kearney)
22. Accident Analysis and Prevention, Reviewer (Kearney)
23. Transportation Research Interdisciplinary Perspectives, Reviewer (Kearney)
24. Spatial Cognition and Computation, editorial board (Plumert)
25. Journal of Experimental Psychology: Applied, editorial board (Plumert)
26. Journal of Experimental Child Psychology, editorial board (Plumert)
27. Accident Analysis and Prevention (reviewer, Reyes)
28. Anuj K. Pradhan – Accident Analysis and Prevention - Guest Editor
29. Transportation Research Record Handling Editor (Christofa)
30. Editorial Advisory Board of Transportation Research Part C: Emerging Technologies (Christofa)
31. Didier Valdés-Díaz, Applied Human Factors and Ergonomics (AHFE), Scientific Advisory Board, 2017-Present.
32. Didier Valdés-Díaz, 19th LACCEI International Multi-Conference for Engineering, Education, and Technology.
33. Didier Valdés-Díaz, 101th TRB Annual Meeting, January 2022, Washington DC.
34. Didier Valdés-Díaz, Editorial Board Member of International Journal of Natural Disasters, Accidents and Civil Infrastructure (RIDNAIC), Scipedia, August 2020 - Present.
35. Benjamín Colucci-Ríos, Applied Human Factors and Ergonomics (AHFE), Scientific Advisory Board, 2017-Present.
36. Benjamín Colucci-Ríos, President Editorial Board of International Journal of Natural Disasters, Accidents and Civil Infrastructure (RIDNAIC), Scipedia, February 2020 - Present.
37. Benjamín Colucci-Ríos, Co-editor “La Columna” Journal of the Institute of Civil Engineers (IIC), College of Engineers and Surveyors of Puerto Rico. 2020 - Present

38. Benjamín Colucci-Ríos, Assistant to the Editor of Dimension Journal, College of Engineers and Surveyors of Puerto Rico (CIAPR), September 2019 - Present.
39. Benjamín Colucci-Ríos, Transportation Research Records of the Transportation Research Board (TRB) Annual Meetings. National Academies of Sciences, Engineering, and Medicine. Washington, D.C., 1987 - Present.
40. Benjamín Colucci-Ríos, Member, TRB Committee AHB55 Work Zone Traffic Control; 2017-2020
41. Benjamín Colucci-Ríos, Member, TRB Standing Committee AND30 Simulation and Measurements of Vehicle and Operator Performance, 2019-2022.
42. Benjamín Colucci-Ríos, Member, TRB Standing Committee on Road User Measurement and Evaluation (ACH50); 2020-2022.
43. Benjamín Colucci-Ríos, Latin American and Caribbean Consortium of Engineering Institution (LACCEI) International Multi-Conference for Engineering, Education, and Technology Scientific Advisory Board. 2021
44. Alberto M. Figueroa-Medina, 101th Transportation Research Board (TRB) Annual Meeting, January 2022, Washington, DC.
45. Alberto M. Figueroa-Medina, Transportation Research Record, TRB Journal.
46. Alberto M. Figueroa-Medina, Accident Analysis and Prevention Journal, Elsevier.
47. Alberto M. Figueroa-Medina, Dimension Journal of the College of Engineers and Surveyors of Puerto Rico, 2019 - Present.
48. Alberto M. Figueroa-Medina, International Journal of Natural Disasters, Accidents and Civil Infrastructure (RIDNAIC), Scipedia, September 2020 - Present.
49. David A. Noyce: Journal of Transportation Engineering (ASCE). Associate Editor.
50. David A. Noyce: International Journal on Sustainable Transportation. Editorial Board.
51. David A. Noyce: Accident Analysis and Prevention Journal. Editorial Advisory Board.

1.2.7 Leadership positions in professional organizations

1. M. Zaki: Paper Review Co-chair of the 2022 TRB AED50 AI and Advanced Computing Applications Committee
2. 2022 ACM CHI Conference on Human Factors in Computing Systems, Program Committee (Rector)
3. 2022 ACM SIGACCESS Conference on Computers and Accessibility, Organizing Committee (Rector)
4. Editorial Board, Driving Simulation Conference 2021 (Kearney)
5. ACM Symposium on Applied Perception, Steering/Program Committee 2021 (Kearney)
6. TRB ACP25 Traffic Signal Systems Committee Member and Paper Review Coordinator (Christofa)
7. TRB AME70 Transportation and Public Health Committee Member and Secretary (Christofa)
8. Didier Valdés-Díaz, Technical Committee, Pan American Federation of Engineering Associations (UPADI), 2020-Present.
9. Benjamín Colucci-Ríos, Member, Board of Directors of the Pan-American Academy of Engineering (PAE), 2018 - Present.
10. Benjamín Colucci-Ríos, Member, Board of Trustees of the Society of Engineers of Puerto Rico (SIPR), 2019 - Present.
11. Benjamín Colucci-Ríos, President of the Pan-American Transport Systems Committee,

Pan-American Federation of Engineering Associations (UPADI), 2017 - Present.

12. Benjamín Colucci-Ríos, Vice-President of the International Society for Maintenance and Rehabilitation of Transport Infrastructures (ISMARTI). 2016 - Present.
13. Benjamín Colucci-Ríos, Assistant to the Editor, Editorial Commission, Dimension Journal Commission, College of Engineers and Surveyors of Puerto Rico, 2019 - Present.
14. Benjamín Colucci-Ríos, Member, International Network of Abertis Chairs
15. Benjamín Colucci-Ríos, Director of Abertis Chair in Puerto Rico.
16. Benjamín Colucci-Ríos, UPRM Program Manager of Dwight David Eisenhower Transportation Fellowship Program (DDETFP) for Hispanic Serving Institutions, 2010 - Present.
17. Benjamín Colucci-Ríos, Spokesperson for the Decade of Action Road Safety of Puerto Rico, 2011- 2020 & 2021-2030.
18. Benjamín Colucci-Ríos, Member of the Board of Directors of the Institute of Civil Engineers, College of Engineers and Surveyors of Puerto Rico (CIAPR-IIC), 2019-Present.
19. Benjamín Colucci-Ríos, Founder and Director of the Puerto Rico Transportation Technology Transfer Center (PR-LTAP). 1986 - Present.
20. Benjamín Colucci-Ríos, Every Day Count (EDC) Program Technical Oversight Director of Puerto Rico PRHTA and U.S. Virgin Islands DPW.
21. Benjamín Colucci-Ríos, Editor-in-Chief El Puente Bilingual Newsletter, Puerto Rico LTAP, 1986 - Present.
22. Benjamín Colucci-Ríos, Co-editor "La Columna" Journal of the Institute of Civil Engineers (IIC), College of Engineers and Surveyors of Puerto Rico. 2020 - Present
23. Benjamín Colucci-Ríos, President, Mobility and Transportation Commission, College of Engineers and Surveyors of Puerto Rico (CIAPR), 2020-Present.
24. Alberto M. Figueroa-Medina, Editorial Commission, Dimension Journal of the College of Engineers and Surveyors of Puerto Rico, 2019 - Present.
25. Alberto M. Figueroa-Medina, Pan-American Transport Systems Technical Committee, Pan-American Federation of Engineering Associations (UPADI), 2020-Present.

1.2.8 SAFER-SIM Webinars

Webinar	**Date**	**Registrants**	**Archived Views**
Minimum Time to Situational Awareness During Transfer of Control Under Varying Levels of Task Load	4/20/2021	30	45
Extended Evaluation of Training Programs to Accelerate Hazard Anticipation Skills in Novice Teens	5/18/2021	26	29
Investigating the Effects of Smartphone based P2V Warning using Driving Simulator Experiments	6/1/2021	15	25
Quantifying the Impacts of Situational Visual Clutter on Driving Performance	6/22/2021	15	18
V2I Infrastructure Placement and Safety Implications of CAVs in an interconnected Network	6/29/2021	12	30

Expectations and Understanding of Advanced Driver Assistance Systems among Drivers, Pedestrians, Bicyclists, and Public Transit Riders	8/24/2021	134	57
Data Collection Methods for Detailed Analysis of Roadway Users Interactions at Intersections with Flashing Yellow Arrows	9/7/2021	26	27
Shared Connectivity for Safer Shared Space Facilities: Improving mobility for non-motorized and VRUs	9/22/2021	45	36

1.2.9 Professional awards

1. M.Zaki awarded the Canadian Society of Civil Engineering 2021 Thomas C. Keefer Medal for earlier research in improving computer vision for traffic applications.
2. Lakshmi Subramanian, University of Iowa Graduate College Summer Research Fellowship, Spring 2021.
3. Wanxin Wang, University of Iowa Graduate College Summer Research Fellowship, Spring 2021.
4. Morgan Parr, University of Iowa Graduate College Summer Research Fellowship, Summer 2021.
5. Ganesh Pai – Link Foundation Fellowship
6. Anuj K. Pradhan – AAAM Elaine Wodzin Award
7. 2021 ADVANCE Faculty Peer Mentor Award [UMass] (Knodler): This annual award recognizes the critically important work faculty members perform in mentoring and supporting the professional development and success of their colleagues.
8. Benjamín Colucci-Ríos, Recognition of the College of Engineers and Surveyors of Puerto Rico (CIAPR)-Mayaguez Chapter, 2021 Engineers Week, for being the first Puertorican and Hispanic-American to be the recipient of the ASCE Wilbur S. Smith Award. May 17, 2021.
9. Benjamín Colucci-Ríos, 2021 ASCE Wilbur S. Smith Award, "... for unending leadership and dedication to action for the improvement of road safety in Puerto Rico and around the world". International Conference on Transportation & Development (T&DI). June 10, 2021.
10. Benjamín Colucci-Ríos, Dedication of the 22th Annual Mega Civil Friday Annual Conference (MVC-2021) "for his lifetime achievements in the field of civil engineering in Puerto Rico and abroad". Institute of Civil Engineers of the College of Engineers and Surveyors of Puerto Rico (CIAPR-IIC). Puerto Rico Convention Center. July 16, 2021.
11. Benjamín Colucci-Ríos, 2021 ASCE Region 5 Wall of Fame Award "... for the hard work and dedication to the Civil Engineering Profession throughout your career". American Society of Civil Engineers (ASCE). September 9, 2021.

1.3 Education and Workforce Development Accomplishments

1.3.1 Peer-reviewed journal publications w/ student authors

1. Guo, Z., Afifah, F.∗, Qi, J, and Baghali, S., A Stochastic Multi-Agent Optimization

Framework for Interdependent Transportation and Power System Analyses. IEEE Transactions on Transportation Electrification. September 2021. https://doi.org/10.1109/TTE.2021.3049127

2. Rahman, R., Hasan, S. and Zaki, M. H. Towards reducing the number of crashes during hurricane evacuation: Assessing the potential safety impact of adaptive cruise control systems. Transportation Research Part C: Emerging Technologies, 128, 103188. July 2021. https://doi.org/10.1016/j.trc.2021.103188
3. Rahman, R., Bhowmik, T., Eluru, N., and Hasan, S. Assessing the crash risks of evacuation: A matched case-control approach applied over data collected during Hurricane Irma. Accident Analysis and Prevention, 159, 106260. September 2021. https://doi.org/10.1016/j.aap.2021.106260
4. Gaspar, J., Carney, C., Shull, E., and Horrey, W. Mapping drivers' mental models of adaptive cruise control to performance. Transportation Research Part F: Traffic Psychology and Behaviour. August 2021. https://doi.org/10.1016/j.trf.2021.07.012
5. Subramanian, L. D., O'Neal, E. E., Roman, A., Sherony, R., Plumert, J. M., & Kearney, J. K. (in press). How do pedestrians respond to adaptive headlamp systems in vehicles? A road-crossing study in a virtual environment. Accident Analysis and Prevention. September 2021. https://doi.org/10.1016/j.aap.2021.106298
6. A. Fallahdizcheh and C. Wang, "Profile monitoring based on transfer learning of multi-profile with incomplete samples," IISE Transanctions, May 2021. https://doi.org/10.1080/24725854.2021.1912439
7. Deliali, K., Christofa, E., & Knodler Jr, M. (2021). The role of protected intersections in improving bicycle safety and driver right-turning behavior. Accident Analysis & Prevention, 159, 106295. September 2021. https://doi.org/10.1016/j.aap.2021.106295
8. Roberts, S. C., Zhang, F., Fisher, D., & Vaca, F. E. (2021). The effect of hazard awareness training on teen drivers of varying socioeconomic status. Traffic Injury Prevention, 22(6), 455-459. July 2021. https://doi.org/10.1080/15389588.2021.1940984

1.3.2 Book chapters w/ student authors

Nothing to report

1.3.3 Conference posters and papers w/ student authors

1. Alberto Figueroa-Medina, Didier Valdés, Benjamín Colucci, Natacha Cardona, and Andrés Chamorro. September 2021. Pedestrian Walking speeds and Success Rates on Mid-Block Crossing Using Virtual Reality Simulation. Road Safety and Simulation Conference 2021.
2. Ryan, A., Ai, C., Fitzpatrick, C., and Knodler, M. Identifying safety-critical road segments and potential countermeasures: A geospatial approach using horizontal curve data. To present at the Institute of Transportation Engineers Annual Meeting, 18–21 July, Portland, OR.
3. Ryan, A., Hennessy, E., Ai, C., Fitzpatrick, C., and Knodler, M. Driver performance at horizontal curves: Bridging critical research gaps to increase safety. Paper Number 7. Road Safety & Simulation International Conference, 22–24 September, Athens, Greece.
4. Horrey, W. J., Benson, A., Guo, Z., Afifah, F., Hamann, C. J., & Santiago, K. R. (2021).

Expectations and Understanding of Advanced Driver Assistance Systems Among Drivers, Pedestrians, Bicyclists, and Public Transit Riders. Proceedings of the Road Safety and Simulation International Conference. Vol 16, p.19. 06/2021

5. Gaspar, J., Carney, C., Shull, E., and Horrey, W. Mapping mental model accuracy and system exposure to driver behavior. Human Factors and Ergonomics Society Annual Meeting 2021.
6. Malik, J., Kim, N. Y., Parr, M. D. N., Kearney, J. K., Plumert, J. M., & Rector, K. (2021). Do simulated augmented reality overlays influence street-crossing decisions in non-mobility-impaired older and younger adults? Submitted for publication.
7. Malik, J., Parr, M. D. N., Flathau, J., Tang, H., Kearney, J. K., Plumert, J. M., & Rector, K. (2021). Determining the effect of smartphone alerts and warnings on the street-crossing behavior of non-mobility-impaired older and younger adults. In CHI Conference on Human Factors in Computing Systems (CHI '21), May 08–13, 2021, Yokohama, Japan. ACM, New York, NY, USA, 12 pages. https://doi.org/10.1145/3411764.3445234
8. O'Neal., E.E., Tang, H., Flathau, J., & Plumert, J.M. (April, 2021). How does parent gender impact the socialization of safety values in sons and daughters? Poster presented at the 2021 biennial meeting of the Society for Research in Child Development (online).
9. Parr, M., Zhou, S., O'Neal, E.E., Kearney, J.K., & Plumert, J.M. (April, 2021). How do Children Perceive and Act on Affordances When Walking vs Bicycling Across Roads? Poster presented at the 2021 biennial meeting of the Society for Research in Child Development (online).
10. Kim, A., O'Neal, E.E., Flathau, J., Tang, H., Kearney, J.K., & Plumert, J.M. (April, 2021). A parent-based intervention program for training prospective control skills in children. Poster presented at the 2021 biennial meeting of the Society for Research in Child Development (online).
11. O'Neal, E.E., Tang, H., Flathau, J., & Plumert, J.M. (April, 2021). Socialization of safety values in children: The role of parent and child gender. Oral presentation at the 2021 annual meeting of the Society for Violence and Injury Research (online).
12. Ryan, A., Christofa, E., Barchers, C., and Knodler, M. (2021). Towards equitable road safety: Socio-demographic divides in municipal highway investments. Conference on Advancing Transportation Equity (CATE), September 2021.

1.3.4 Paper/poster awards w/ student authors

Nothing to report

1.3.5 Graduate students working on and supported by SAFER-SIM related projects

Site	**Number**
University of Iowa	10
University of Wisconsin Madison	3
University of Massachusetts Amherst	9
University of Central Florida	10
University of Puerto Rico Mayaguez	11

1.3.6 Undergraduate students working on and supported by SAFER-SIM related projects

Site	Number
University of Iowa	7
University of Wisconsin Madison	2
University of Massachusetts Amherst	4
University of Central Florida	2
University of Puerto Rico Mayaguez	3

1.3.7 Student attendance and presentations at the SAFER-SIM symposium

Nothing to report

1.3.8 Transportation-related M.A. and PhD theses

1. Ma'en Al-Omari (Spring 2021), Crash Analysis And Development Of Safety Performance Functions For Florida Roads in the Framework of the Context Classification System. (Master Thesis)
2. Ma'en Al-Omari (Summer 2021) Evaluation of Unconventional Signalized Intersections on Arterial Roads and a Proposition for a Novel Intersection Design. (PhD dissertation)
3. Zubayer Islam, PhD dissertation, title "Applying Machine Learning Techniques to Improve the Safety and Mobility of the Urban Transportation System Using Infrastructure- and Vehicle-Based Sensors."
4. Nada Mahmoud, PhD dissertation, title "Safety and Operations of Urban Arterials Incorporating the Context Classification System."
5. Pei Li, PhD dissertation, title "Real-Time Traffic Safety Evaluation in the Context of Connected Vehicles and Mobile Sensing."
6. Shile Zhang, PhD dissertation, title "Improving Pedestrian Safety Using Video Data, Surrogate Safety Measures and Deep Learning"
7. Pranaykumar Kasarla, MS Dissertation, Title "EVALUATION AND COMPARISON OF PARAMETRIC AND NON-PARAMETRIC METHODS FOR DRIVING BEHAVIOR ANALYSIS"
8. Fangda Zhang successfully defended his PhD dissertation on June 11. This SaferSim project and Fangda's dissertation use similar analytical techniques.
9. Equitable Resource Allocation to Improve Safety: An Evaluation Based on Risk [PhD Dissertation, Alyssa Ryan; supervised by M. Knodler]
10. Investigating the Safety Impacts of Left-Turn Infrastructure on the Vulnerable Driving Population [PhD Dissertation, Francis Tainter; supervised by M. Knodler]
11. Abigail Helm successfully defended her PhD. This SaferSim project was used for her PhD dissertation.
12. Fred Song. "Traffic Crash Patterns and Causations based on Sequence of Events: Preparing for a Transition into Safe Automated Transportation"

1.3.9 Curriculum modules developed

1. UM - Several modules related to bicycle and pedestrian transportation as part of the new Pedestrians and Bicyclists undergraduate/graduate course (Christofa)

1.3.10 Student internships related to SAFER-SIM

1. NSF Research Experience for Undergraduates summer fellowship student supported to work in the Hank Lab.
2. Workplace Learning Connection internship team of high school students spent 8 weeks this summer working with gaze coordinate data from our study to visualize data and identify glances
3. 12 high school interned at NADS through Workplace Learning Connection
4. Volpe National Transportation Systems Center, Transportation Human Factors (Leila Cesic)

1.3.11 Presentations to student groups or classes

1. Emily Shull presented a 3-minute thesis to a graduate seminar class. The presentation related to the current SaferSim project as well as a past SaferSim project.
2. Shannon Roberts presented her perspective on incorporating diversity, equity, and inclusion into research to 15 high school students in the Massenberg Summer Institute on July 12, 2021.
3. Shannon Roberts presented her perspective on obtaining an engineering degree to 20 community college students (from Springfield Technical Community College) on July 28, 2021.

1.3.12 # Schools visited and # students present

Nothing to report

1.3.13 # Career fairs visited and # of attendees

Nothing to report

1.3.14 Summer institutes and programs and # of students participating

1. Perry Research Scholars Institute through Belin-Blank summer program (16), 7/14/2021
2. Iowa National Summer Transportation Institute Zoom presentation (15), 6/24/2021
3. XIX Summer Transportation Institute 2021 (STI), June 17 - July 15 2021. Virtual Reality and Driving Simulation Projects and Presentations. Number of students participating: 14.

1.4 Technology Transfer

1.4.1 SAFER-SIM webinars

8 webinars

1.4.2 Registrations for webinars

303 registrations

1.4.3 Views of archived webinar content

267 views

1.4.4 Press releases for SAFER-SIM related research

Nothing to report

1.4.5 Media requests

Title	Publisher
1. Expert says driver distraction is becoming more dangerous in Iowa	KWWL
2. Iowa State Patrol focus on bad driving habits with enforcement project, say distracted driving plays a role	KCRG
3. Preventing child pedestrian injuries: Q & A with Dr. Elizabeth O'Neal	UI IPRC
4. Elizabeth O'Neal wins K99 Award from NICHD to Study Teen Safety	UI CLAS
5. Ganesh Pai Mangalore Wins Prestigious Link Foundation Fellowship	UMass COE
6. Best & Worst States for Teen Drivers	WalletHub
7. Study: Marijuana's Impact on Driving Is Strain-Specific	Forbes
8. Smart Driving Cars Podcast	Smart Driving Cars Podcast

1.4.6 Tours of facilities

1. Rivian – July 21-22, 2021
2. Trail Trekkers – August 5, 2021
3. Iowa Lt. Governor – August 6, 2021
4. Iowa State Legislators – September 22, 2021

1.4.7 Website traffic

Metric	This Period	Lifetime
Total Users	2,090	22,387
New Users	2,051	21,875
Sessions	3,371	42,737
Page Views	7,426	90,468

1.4.8 Patents filed

Nothing to report

1.4.9 DOT requests for presentations or proposals related to SAFER-SIM

Nothing to report

1.4.10 Practitioner attendance at events

1. Central Northeast Florida ITE Webinar. UCF. August 18, 2021Title: Assessing the Safety Impacts of Evacuation Traffic: A Case Study of Hurricane Irma. Number of attendees: 35 (mostly from transportation professionals from Central Florida region)
2. D. Valdés-Díaz, A. Figueroa-Medina, and B. Colucci Rios. July 15, 2021. Research in Civil Engineering related to the SAFER-SIM project. Presented at the Research Forum at the Transportation Week of the Puerto Rico Department of Transportation and Public Works. San Juan, PR.
3. 46 practitioners at SAFER-SIM webinars
4. 100 attendees at the 11th International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design

1.4.11 Number of improved or new simulation technologies, software, methods, or processes

Nothing to report

1.5 Collaboration

1.5.1 Attendance at the SAFER-SIMposium

Nothing to report

1.5.2 Interdisciplinary research projects within and across sites

1. Using Simulation to Assess and Reduce Conflicts between Drivers and Bicyclists (Computer Science/Psychological & Brain Sciences)
2. Multi-modal Distributed Simulation Combining Cars, Bicyclists, and Pedestrians (Computer Science/Psychological & Brain Sciences)
3. Using Simulation to Study Communication between Autonomous Vehicles and Vulnerable Road Users (Computer Science/Psychological & Brain Sciences)
4. Understanding Bicyclists' Behaviors Through Learning from Big Trip Data (Business/Public Health/Urban & Regional Planning)
5. Defining Safety-Critical Scenarios for Simulation-Based Automated Vehicle Evaluation - (UW-Madison Engineering/Global Health Institute)
6. Attention and Adaption of Teen Drivers to Driving Automated Systems – (UMass College of Engineering/College of Natural Sciences)

1.5.3 Collaborative research projects across SAFER-SIM or other UTC sites

1. Multi-modal Distributed Simulation Combining Cars, Bicyclists, and Pedestrians (UI/UW/UM)
2. Using Simulation to Assess and Reduce Conflicts between Drivers and Bicyclists (UI/UM/UCF)
3. Enhancing School Zone and School Bus Safety (UCF/UPR)
4. Evaluation of Safety Enhancements in School Zones with Familiar and Unfamiliar Drivers (UPR/UM)
5. The Impact of Driver's Mental Models of Advanced Vehicle Technologies on Safety and Performance (UI/UM)
6. Analyzing the Performance of Remote-Drivers on Transit Shuttle Short Routes (UW/UPR)
7. Interfacing Synchrono and NADS for Virtual Simulation of Conventional & Connected and Autonomous Vehicles (UW/UI)
8. AAAFTS/SaferSim Cooperative Research Program (UI/UM/UW/UCF)

1.5.4 Collaborations with industry partners and government agencies

Organization Name	*Location*	*Contribution*
1. Aisin Technical Center of America	Northville, MI	Financial support
2. AAA Foundation for Traffic Safety	Washington D.C.	Financial support Collaborative research
3. InSight Learning Technologies	Pacific Palisades, CA	Personnel exchange
4. Mandli Communications Inc.	Madison, WI	In-kind support Facilities Collaborative Research
5. Continental Mapping Consultants Inc	Madison, WI	In-kind support Facilities Collaborative Research
6. Council of University Transportation Centers	Washington D.C	Financial support
7. Hyundai America Technical Center Inc.	Superior Township, MI	Financial support
8. City of Orlando	Orlando, FL	Collaborative Research
9. Recreative Association of Sport Buenaventura	Mayaguez, PR	Facilities
10. Mayaguez Bureau of Highway Patrol	Mayaguez, PR	Facilities Personnel Exchange
11. Club de Oficinistas de Mayagüez	Mayaguez, PR	Facilities
12. Puerto Rico LTAP Center, University of Puerto Rico at Mayaguez	Mayaguez, PR	Facilities
13. VHB	Washington D.C.	In-kind support
14. Lee Engineering	Phoenix, AZ	In-kind support

15. UW-Madison Global Health Institute	Madison, WI	Collaborative Research
16. City of Racine **New this period**	Racine, WI	Financial support
17. Gateway Technical College **New this period**	Racine, WI	In-kind support

1.5.5 Collaborative peer-reviewed journal publications
Nothing to report

1.5.6 Collaborative book chapters
Nothing to report

1.5.7 Student exchanges with other SAFER-SIM sites
Nothing to report

1.5.8 Students pursuing advanced degrees at other SAFER-SIM sites
Nothing to report

1.5.9 Programs involving community colleges
1. University of Wisconsin Shuttle Project involving Gateway Technical College

1.5.10 Graduates hired at SAFER-SIM, other UTC sites, or external organizations
1. Francis Tainter – Post-Doctoral Researcher – University of Massachusetts - Amherst
2. Fred Song, PhD. Graduated. Placed at University of Connecticut as a Post-Doctoral Researcher

1.6 Diversity

1.6.1 # SAFER-SIM projects involving underrepresented/minority (U/M) students
22 projects involving 23 students

1.6.2 # U/M events attended
1. Shannon Roberts sat on a panel for the Massenberg Summer Institute, which is for underrepresented high school students, on July 30, 2021. There were approximately 15 students in attendance in addition to 5 other faculty of color.
2. Iowa National Transportation Summer Institute in July 2021 at UI – 15 students

1.6.3 # U/M students at attended events

30 students

1.6.4 Graduating U/M student placement

1. Alyssa Ryan, Assistant Professor at Arizona State University
2. Yalda Ebadi, Jaguar Land Rover North America

1.7 Outcomes

1.7.1 Number of improved or new technologies, software, methods, or processes adopted

1. A simulation platform for pedestrian behavior and interaction in shared spaces was improved from this SAFER-SIM project. The simulation considers the microscopic behavior through the modeling of the gait parameters, group behavior and obstacle avoidance. A stable connectivity network in MANET comprising of active mobile traffic agents and their walking behavior. The network will be used for data dissemination for safety events
2. A novel method to capture the interactions among different DPMs so that the prediction performance was improved from this SAFER-SIM study. The method was validated in NADS-1 and mini-SIM under various driving conditions, and the results demonstrated that 15%-20% improvement of DPM prediction accuracy can be achieved.

1.7.2 Stakeholders who adopt, implement or deploy SAFER-SIM research findings or technologies through policy, practice, regulation, rulemaking or legislation

Nothing to report

1.7.3 Number of projects that reach adoption, implementation or deployment

Nothing to report

1.8 Impacts

1.8.1 Expected reductions in crashes from implemented policy, practice, regulation, rulemaking, or legislation

1. The developed simulation this SAFER-SIM project will provide a means to understand the behavior of pedestrians under mixed traffic conditions. The developed framework aids in investigating urban mobility and peer to peer communication scenarios which will foster next generations shared transportation systems. A robust communication network will share information reliably to all the participating nodes in a network and therefore can be used to address challenging times of disaster evacuation, emergency evacuation.

Better communication will help to maintain the safety of non-motorized traffic agents and micro-mobility agents against motorized traffic in shared space.

2. By supporting the safety evaluation of automated vehicles, this SAFER-SIM research can hasten the development and deployment of AVs and turn the widely expected societal benefits of AV into reality.
3. The results of this SAFER-SIM study indicate that drivers' visual environment could have significant impacts on traffic safety. The findings could provide a cost-effective method to evaluate road safety and identify important features to reduce crash occurrence and severity if implemented.

1.8.2 Expected reduction in congestion and traffic conflicts from implemented policy, practice, regulation, rulemaking or legislation

1. The direct impact of this SAFER-SIM project is to provide an accurate prediction of the Driving Performance Measures (DPMs) under unobserved driving conditions, which can reduce simulation costs and time. The long-term impact of the project is to reveal the interaction mechanism among different DPMs, which can provide guidance for the DPM design and collection process. A 30%-40% deduction of simulation costs and time can be expected by using the proposed DPM prediction method. The thorough understanding of the DPM interactions can contribute to accurate control and feedback of autonomous driving.