



**Professor Mohamed A. Abdel-Aty**  
**Pegasus Professor and Chair**  
**University of Central Florida**  
**USA**



Office of the Dean

Michael Georgiopoulos, PhD  
Dean

College of Engineering and Computer Science

Tel: (407) 823-2156

Email: michaelg@ucf.edu

October 25, 2021

World Cultural Council

Dear Colleagues

It is my pleasure to nominate Dr. Mohamed Abdel-Aty for the World Award of Science. I have had the honor of working with Dr. Aty for almost 27 years first as colleagues at the University of Central Florida (UCF) and now as the Dean of the College of Engineering and Computer Science, where Dr. Aty is serving since 2013 as the Chair of the Department of Civil, Environmental and Construction Engineering. Dr. Aty has long history of significant and outstanding contributions to research and education in transportation science.

In addition, Dr. Aty is a Trustee Chair. He is leading the Future City initiative at UCF, is the director of the Smart and Safe Transportation Lab, the Winner of the USDOT Solving for Safety Challenge, and introduced in 2019 the first MS degree in Smart Cities in Engineering in the US. In 2015, he was awarded the Pegasus Professorship, the highest honor at UCF. He was the 2007 UCF Outstanding Graduate Teacher and the 2003 UCF Distinguished Researcher. He has supervised to completion 35 PhD and 60 MS students and is currently advancing 18 more PhD students. His students received twice the best University PhD dissertation, and once the best MS thesis, and the Milton Pikarsky Memorial Award for the best Master's thesis in the field of science and technology in transportation studies (Council of University Transportation Centers), 2019. Under Dr. Aty's leadership, UCF Transportation Science and Technology has increased its ranking to 29th in the world and 5<sup>th</sup> in the US.

Dr. Aty is a member of the Academy of Science, Engineering and Medicine of Florida (ASEMFL). He is an Associate Editor for the *ASCE Journal of Transportation Part A: Systems, Transportation Research Interdisciplinary Perspectives*, and Executive Associate Editor of *Analytic Methods in Accident Research*. He is a member of the Editorial Boards of the *ITS Journal*, *Transportation Research Part C* and the *International Journal of Sustainable Transportation*, Fellow of both ASCE and ITE, and member of multiple TRB Committees. He is the Chair of the ASCE Transportation Safety Committee, member of the Board of Directors (2020-2022) International Road Federation, and a delegate of the National Safety Council - NSC (2021-2023). He is one of 3 founders of the Central Florida Automated Vehicles Partnership and serves on the Mayor's expert panel for the 2030 Orange County Sustainable Operations and Resilience Action Plan. Dr. Abdel-Aty is the Editor Emeritus of *Accident Analysis and Prevention*, the premier journal in safety.

He is pioneer and well recognized nationally and internationally in research in real-time safety, proactive traffic management, integrating road safety and transportation planning, and Connected Vehicles. Dr.

P.O. Box 162993 • Orlando, FL 32816-2993 • Fax: 407-823-5483

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Aty has managed 74 research projects with an aggregate value of \$22.8 million. He has published more than 710 papers including 367 Journals, with more than 22,300 Google Scholar citations and an H-Index of 81. He has delivered more than 200 presentations, of them more than 25 keynote speeches; He is the most cited author in Road Safety. He was recognized in 2020 by Publons Web-of-Science as a Highly Cited Researcher. According to Clarivate™, about 0.1%, of the world's researchers, in 21 research fields and across multiple fields, have earned this exclusive distinction.

Dr. Aty has many notable contributions in Transportation Safety and Technology and applications of AI, and projects that have been implemented and making a key difference in road safety include: Pro Active Traffic Management (PATM), Real-Time Safety Risk Prediction, and Transportation Safety Planning. Many have been emulated and implemented around the world. In 2019, under Dr Aty's leadership, the University of Central Florida was selected as the first-place winner of USDOT Office of the Secretary Safety Challenge for developing a full working analytical visualization tool. The system is approved for provisional patent and published (patent pending). He has developed three software safety systems based on data analytics, AI and computer vision, Real-Time Safety, ARCIS, and Near Miss Event Detection.

Traffic accidents have become a global challenge with no comprehensive and sustainable solution in sight. The world is approaching yearly 1.4 million fatalities and 50 million serious injuries. According to the US Center for Disease Control, the cost to the world economy is \$2 Trillion. Solving the multifaceted road safety problem would substantially enhance the quality of life globally, save extensive valuable resources and saved funds could be redirected to health, education and helping societies thrive. Dr. Aty is a visionary that started since 2002 to consider Safety Science as a truly multidisciplinary field, with Technology and Data Science as the glue that binds the many relevant fields together. He has developed a system that monitors traffic safety of all the roads and provide alerts in real-time that in the next 5-15 minutes there is a high impending risk of a traffic accident at a certain location. And an Artificial Intelligence system recommends the best solution that will reduce that risk. This is part of what Dr. Aty has invented over the last 20 years and the system has won a 2019 USDOT Safety Challenge among 54 top major technology/university teams. The idea started in 2002 when Dr. Aty inspected over 4,000 accidents and for each analyzed the microscopic pattern of accident occurrence and the associated traffic flow parameters obtained from infrastructure-based detection systems for up to 30 minutes preceding each accident. Dr. Aty could see how the condition on a roadway could change over time to form the situation that leads to an accident. He concluded that there are different flow regimes on highways that could be identified in real-time as accident prone and propagate, thus a solution could be invented to prevent the impending accident. This was the beginning of a long and extensive innovative work as it opened the door to a new field in safety science. Dr. Aty extended his technology to data generated from vehicles, thus applicable to all nations and all roads irrespective of the resources of installing vehicle detection equipment on roads. That data is generated from vehicles as they travel while connected to the infrastructure, cloud or smart phone generated. Then, in several influential studies Dr. Aty created the concept of ProActive Traffic Safety Management (PATM) using various advanced techniques. Dr. Aty adapted these strategies with the objective of reducing the real-time turbulent traffic condition or breaking the cycle of traffic flow regimes leading to higher potential of accidents. In short Dr. Aty's work has totally changed the traffic safety science field. For the first time it is possible to predict every accident before it occurs and have the ability to prevent it. This is a total change in paradigm in road safety science and provides immense hope for a more sustainable, safe, and better transportation system and will further stimulate cutting-edge research and development in road safety science and technology.

Dr. Aty has received the 2020 Transportation Research Board (National Academies) Roy W. Crum Distinguished Service Award, National Safety Council's Distinguished Service to Safety Award, Francis C. Turner award from the American Society of Civil Engineers for his "outstanding leadership in the field of road safety". He has also received the 2019 Transportation Safety Council Edmund R. Ricker Award (Institute of transportation Engineers) and the Lifetime Achievement Safety Award from the American Road and Transportation Builders Association in 2019. He received multiple International awards, e.g., prestigious Prince Michael International Road Safety Award, London 2019. He has delivered more than 25 Keynote speeches around the world.

I am honored to be nominating Professor Aty, and I hope that he would be recognized by this prestigious award, and that this prize brings attention to the major societal problems of road safety. Dr. Aty is a truly distinguished leader, educator and scholar who has made an enormous difference to the world, our country, and students. He is truly deserving of the World Award of Science.

Sincerely

A handwritten signature in black ink, appearing to read 'M. Georgiopoulos', with a stylized, flowing script.

Michael Georgiopoulos  
Dean, College of Engineering and Computer Science  
University of Central Florida





**AJOU UNIVERSITY**  
206 Worldcup-ro, Yeongtong-gu, Suwon, 16499, Korea  
Phone. +82-31-219-2114 Homepage. [www.ajou.ac.kr](http://www.ajou.ac.kr)



Oct 25<sup>th</sup>, 2021

World Cultural Council  
World Award of Science

Dear Distinguished Panel Members

It is my pleasure to write this letter of reference for Professor Mohamed Abdel-Aty who is being nominated for the World Award of Science. As the ex Chair of MTC [Metropolitan Transport Commission] of the Korean Government, Past President, Korean Society of Transportation [KST], ex Chair, World Road Association [PIARC] Korea, Director, National Center for Sustainable Urban Transportation (ERC), and Professor at the Dept. of Transportation Eng. at Ajou University, and since I am very familiar with Prof. Aty's many contributions to safety science in the US, Korea and around the world, I feel especially qualified to write this letter.

I would not be exaggerating if I state that Prof. Aty is the most famous worldwide and certainly in Korea in safety research, innovation, and technology. That is due to his so many influential and visionary publications, ideas, and projects that changed much of the state-of-the-art. He has visited Korea many times as advisor on many occasions and supported much of our efforts. He was awarded the Korea Society of Transportation's prestigious international award for his "many innovative ideas that changed much of the safety research and practice as one of the top safety researchers that are recognized worldwide". His advice to the International Transport Forum (OECD countries) on his revolutionary real-time safety prediction and prevention technologies has encouraged Korea Expressway Authority to start this effort for implementation. The project which is underway is being conducted by Professor Junyoung Park of Hanyang University, and former PhD student of Prof. Aty. The main purpose of this research is to develop a real-time monitoring and analysis technology to enhance traffic safety of expressways in Korea.

Dr. Abdel-Aty's innovation in real-time crash prediction and Proactive Traffic Management (PATM) has a huge transformative impact on the research and practice of the traffic and transportation area by enabling the prediction of high crash potential conditions using real-time big data and suggesting the best solution in real-time. In the past 25 years, Dr. Abdel-Aty has published more than 714 papers, including about 370 in journals. Thanks to Dr. Abdel-Aty's breakthrough and continuing work in the real-time crash prediction field, scientists all over the world are pushing forward road safety research to provide real-time road safety insights for traffic safety management and control. The research and practice pioneered by Dr. Abdel-Aty have also played a key role in adding safety aspects to the implementation of Intelligent Transportation System (ITS) technologies by introducing the concept of Proactive Traffic Management (PATM) in order to prevent traffic crashes and save lives through timely intervention in traffic flow. The technology of real-time crash prediction is crucial for PATM strategies by providing the predictive insights for road safety, and hence improve road flow conditions, achieve the goal of "Vision Zero" (eliminate all traffic fatalities and severe injuries), while increasing safe, healthy, equitable mobility for residents. The innovation, in turn, also boosted the use of Big Data and cutting-edge technologies in the field of transportation. Based on the extensive work and the innovative concepts, Dr. Abdel-Aty's team developed the impressive and award-winning system named "Real-time crash risk visualization using integrated tools for traffic safety evaluation and management," which won the USDOT Solving for Safety Visualization Challenge and the prestigious Prince Michael International Road Safety Award in 2019.

Dr. Abdel-Aty is a well-recognized and leading innovator in the field of transportation science. He is also the Editor Emeritus of Accident Analysis and Prevention, the premier journal in safety. From 2019 to 2021, Dr. Abdel-Aty has received the 2020 National Safety Council Distinguished Service to Safety Award, the 2019 ASCE Francis C. Turner Award, and the 2021 Roy W. Crum Distinguished Service Award from the Transportation Research Board of the National Academies for his "achievements in the development of immediate practical applications of his fundamental and developmental research results as well as for contributing broadly to the science of transportation safety." Moreover, he has supervised 35 Ph.D. and 60 master students. I believe Dr. Abdel-Aty's innovation will further benefit society in the future by preventing more traffic crashes and saving lives.

In Korea we are looking at Traffic Safety as a challenge but also an opportunity. In Korea we experience annually close to 5000 traffic deaths (in China as an example this number is nearly 250,000), and over 220,000 injuries. It's a major Public Health problem and a challenge that needs concerted efforts at all levels. But above all it requires much innovative approaches. Here comes the opportunity of generating ideas to use technology which will boost innovation by both scientists and the private sector working to meet this societal challenge. The economic cost of traffic crashes in Korea is estimated at about \$21 Billion. Funds saved by improving safety would be directed to education, health care, environmental programs and other services that will improve directly and indirectly the quality of life, sustainability, air quality and other needs. This is exactly how the impact of Prof. Aty's work is playing a major role in so many ways to achieve that. His impressive real-time safety improvement concepts, in particular, and how it is adapted based on the conditions on each segment of the road network and how for the first time we have an opportunity to prevent actual impending accidents. I have seen this rather complicated system working in real-time and it is very impressive to say the least.

In summary, with Prof. Aty's international stature, creativity and contributions to improving road safety, I honestly cannot think of a more deserving candidate for the honor of the World Award of Science.

Sincerely,



Dr. Keechoo Choi

Professor, Department of Transportation Systems Engineering, Director, National Center for Sustainable Urban Transportation (ERC), Ajou University, Suwon 16499, Korea  
ex Chair of MTC [Metropolitan Transport Commission] of the Korean Government  
Past President, Korean Society of Transportation [KST]  
ex Chair, World Road Association [PIARC] Korea  
Member Korea Academy of Engineering



On behalf of  
Hyungju Park, President, Ajou University



UNIVERSITY OF CENTRAL FLORIDA

**Civil, Environmental, & Construction Engineering**

12800 Pegasus Drive, Suite 211  
PO Box 162450  
Orlando, FL 32816-2450

World Cultural Council  
World Award of Science

October 28, 2021

Dear Ladies and Gentlemen

**RE: Reference Letter for Professor Mohamed Abdel Aty's Nomination for the World Award of Science**

I write to enthusiastically support the nomination of Prof. Mohamed Abdel-Aty, for the World Award of Science. I am very familiar with Professor Aty's accomplishments over many years and can emphatically state that he is an eminent scientist and scholar. I cannot think of a more deserving scientist for the honor based on his contributions to realizing a futuristic vision. My support is based on his outstanding accomplishments, contributions to innovation, and exemplary service to his profession and society. Some of these are summarized in the following paragraphs.

**Prof. Aty's Accomplishments and Contributions.** Prof. Aty's accomplishments include those obtained as an academic to advance the body of knowledge, those that relate to his activities in the professional societies and those that relate to practice and impact. As an academic, he has served as a Professor for many years, teaching, mentoring, and supervising both undergraduate and graduate students. This has resulted in the graduation of many young men and women with the BS degree, 60 with the MS degree and 35 with the Ph.D. degree. He is currently supervising 18 more Ph.D. students. Most of these qualified engineers and scientists are now holding the fort in the profession. Some are now holding very responsible positions in industry and academia, including states' agencies, consulting firms, and research organizations. For example, his former students now hold professorial positions at many universities in the USA and abroad. These include among others, Pennsylvania State University, California Polytechnic State University, and the University of Kentucky in the USA, Cairo University in Egypt, King Saud University in Saudi Arabia, Tongji University in China and Hanyang University in South Korea. He is currently the head of the Civil, Environmental and Construction Engineering department at the University of Central Florida. As head, he designed and established the first MS degree in

Engineering in Smart Cities in the US. This effort produces professionals that have the skills and expertise to cope with the emerging challenges associated with the creation of Smart Cities. These include the integration of smart transportation, smart and resilient infrastructure, and technological advancements in environmental engineering and water resources that will be necessary for the design and establishment of future cities. This will greatly advance the ability of the new generation of engineers and scientists to cope with an important emerging challenge.

As an Academic, Professor Aty has been conducting leading-edge research in the areas of Road Safety and Active Traffic Management Systems. These incorporate Computer Vision, Deep Learning Modeling and Application, Large Data Collection and Analytics, and Development of Safety Countermeasures. He has been the PI or Co-PI for 76 projects with a total funding for the University of Central Florida of over \$22M. His funding sponsors include US Department of Transportation (USDOT) Office of the Secretary, Federal Highway Administration (FHWA) and Florida Department of Transportation (FDOT). He has 370 refereed archival publications in high-impact journals that include IEEE Transactions on ITS, IEEE Transactions on Vehicle Technology, Transportation Research A, C and F, Journal of Safety Science, Accident Analysis and Prevention, and ASCE Journal of Transportation Engineering. The quality of Prof. Aty's research is manifested in his publication recognition, which includes 10 best paper awards, a Google Scholar citation to date of 22,200 and an h-index of 81. His research activities have led to the development of software, tools, traffic analysis procedures, methods for analyzing large safety and traffic data that are now being used by researchers. His research has also led to the development of safety systems that have been implemented on roadways at locations around the world and are making significant impact on road safety. These include: (i) a procedure that facilitates Crash Predictions for Expedited Detection (CPED). This has been incorporated into the Traffic Safety Management System deployed at FDOT Traffic Management Center. It advances the work of the center to predict and verify high safety risk in real-time, utilizing big data and CCTVs. (ii) Pro Active Traffic Management (PATM) tool, a Real-Time Safety Risk Prediction tool, (iii) The award-winning system for the USDOT Office of the Secretary "Safety Challenge" that won the first place (award received from HE Elaine Chao). It has been implemented in Florida. USDOT has also included it in an RFP for other jurisdictions for implementation, and more funding to add more features to the system. The system is approved for a US provisional patent which has been published. (iv). An innovative design of intersections which has been included in the Florida Manual on Intersection Control and Evaluation. (v) A new intersection design to accommodate high volumes while reducing conflicts. This has been implemented and evaluated. (vi) Crash Modification Factors (CMFs) which are now included in the FHWA's CMFs Clearinghouse. (vi). Work on Diverging Diamond intersections (DDI) which has led to FL converting 35 interchanges to DDIs. (vii). Solutions for mitigating the impact of fog condition on roadway sections which have now been implemented. (viii) Machine Learning Models that predict traffic movements at intersections and traffic signal data for up to 5 subsequent cycles. These models are being used by FDOT, thereby eliminating the need for cameras and computer vision systems at several signalized intersections. Thus, providing a key that significantly advances a more efficient use of adaptive signals and

Infrastructure to Vehicles communication. These examples clearly illustrate the exceptional way that Dr. Aty has contributed to the profession.

**Service to the Profession.** Professor Aty is a Fellow of the American Society of Civil Engineers (FASCE), a Fellow of the Institute of Transportation Engineers (FITE), and a member of the Academy of Science, Engineering and Medicine of Florida (ASEMFL). He has been actively participating in the activities of the Profession through the exemplary service he has been giving to these and other professional organizations over the years. For example, he served as Editor-in Chief/Editor of several professional archival Journals. These include Accident Analysis and Prevention, published by Elsevier and the Journal of Transportation: Systems, published by ASCE. Professor Aty has and continues to serve as the Chair of several committees of professional organizations and Co-Chair of national and international conferences and symposiums. These include Chair of the Transportation Safety Committee of ASCE, Co-chair of Road Safety and Simulation Conference in 2015, and Chair of the 5<sup>th</sup> and 7<sup>th</sup> International Symposiums on Transportation Safety in Shanghai.

**Service to Society.** In addition to Prof. Aty's exemplary service to the profession, he has been involved in numerous activities that illustrate his keen interest in serving society. For example, his willingness to meet with the press when ever asked, and his knowledgeable and clear answers to question has made it easier for the public to understand difficult and puzzling issues that relate to traffic safety. He has given 16 TV interviews, 4 radio interviews and published 26 news articles in the press, including the Associated Press, the Washington Post, the Boston Globe, Los Angeles Times, the London Guardian and the Seattle Post Intelligencer. Professor Aty has also provided exemplary service to society through his membership in several civic societies and committees in the USA and abroad. For example in the USA, he served as a member of the Orange County Mayor's County Sustainable Operations and Resilience Action Plan and as a delegate to the National Safety Council. Internationally, Prof Aty has served as an adviser to many safety organizations or as a member of many safety committees. These include the Italy National Promotion Commission for Associate and full Professors in Transportation and Infrastructure sector, chair of the Advisory Committee of the Joint International Research Laboratory in Transportation Safety China, member of the Advisory Board to the College of Engineering at Tongji University, served as a foreign advisor to the Transportation Commission, Republic of Korea, served as a leading member of the team that developed the Shanghai strategic safety plan and as an adviser to the Road Federation Group of Experts on Road Safety that included the IRF Geneva and the Ministries of Transportation and Communications of Egypt.

**Honors and Awards.** Because of the exemplary professional and societal accomplishments of Prof. Aty, he has received numerous honors and awards. These include, (i) The Prince Michael International Road Safety Award, (ii) the Distinguished Service to Safety Award, regarded as the most prestigious award given to individuals by the National Safety Council, (iii) the Roy W. Crum Distinguished Service Award, top award of Transportation Research Board of the National Academies, 2020, (iv) the Lifetime Safety Achievement Award, the ARTBA Transportation Safety Council (v) the Edmund R. Ricker Safety Award, Institute of Transportation Engineering (ITE),



and (vi) the Korean Society of Transportation, 2018 Achievement Award. Again these awards are a testimony to the exemplary contribution of Dr. Aty to his profession and the Society, both at home and abroad.

In Summary, Prof Aty is an eminent scientist, who has extraordinarily exceeded all the expectations. I therefore without any reservations enthusiastically support the recommendation for him to be the recipient of the 2022 World Award of Science.

Sincerely.



Nicholas J Garber Ph.D., P.E, F.ICE (UK), F.ITE., Dist.M.ASCE  
Henry L. Kinnier Professor Emeritus, UVA  
Distinguished Professor, UCF  
Member of the National Academy of Engineering

**Mohamed A. Abdel-Aty, Ph.D., P.E., F.ASCE, F.ITE, ASEM FL**

Pegasus Distinguished Professor, Trustee Endowed Chair  
Chair, Department of Civil, Env & Construction Engineering, *University of Central Florida*  
<https://www.cece.ucf.edu/aty/>

Dr. Mohamed Abdel-Aty, PE is a Trustee Endowed Chair at the University of Central Florida (UCF). He is a Pegasus Distinguished Professor and the Chair of the Civil, Environmental and Construction Engineering Department at UCF. He is leading the Future City initiative at UCF. He introduced in 2019 the first MS degree in Smart Cities in Engineering in the US. He is also the director of the Smart and Safe Transportation Lab<sup>1</sup>, the Winner of the USDOT Solving for Safety Visualization Challenge<sup>2</sup>, Real-time crash risk visualization using integrated tools for traffic safety evaluation and management, November 2019. His main expertise, and interests are in the areas of traffic safety, simulation, big data and data analytics, Intelligent Transportation Systems and Connected and Automated Vehicles. He is pioneer and well recognized nationally and internationally in work and research in real-time safety, Proactive traffic management, integrating road safety and transportation planning, Highway Safety Manual and Connected Vehicles. In 2015, he was awarded the Pegasus Professorship, the highest honor at UCF. Dr. Abdel-Aty has managed 74 research projects of \$22.8 million. He has published more than 710 papers, more than 367 in journals (Google Scholar citations are more than 22,300 H-Index 81; his Science direct papers downloaded > 370,000 times). He is the most cited author in Road Safety. He was recognized in 2020 by Publons Web-of-Science as a Highly Cited Researcher, Clarivate™ identifies the world's most influential researchers — the select few who have been most frequently cited by their peers over the last decade (about 0.1%, of the world's researchers, in 21 research fields and across multiple fields, have earned this exclusive distinction, November 2020). He has supervised to completion 35 PhD and 60 MS students (currently 18 more PhD students). Dr. Abdel-Aty is the Editor Emeritus of *Accident Analysis and Prevention*, the premier journal in safety. UCF Transportation Science and Technology under Dr. Aty's leadership ranked 29 in the world and 5<sup>th</sup> in the US, ARWU (Shanghai ranking), 2020.

While Dr. Aty's early career was very successful in developing new ideas in safety research, he was convinced that he still followed the traditional reactive approaches and that the results will still be unimpressive in eliminating fatalities and serious injuries. The real revolution started in 2002 when Dr. Aty convinced inspected the dual loop detectors' data being collected on Freeways for other purposes. He was convinced that this new data should be used in safety to achieve his pro-active safety vision. At that time the word "big data" was not yet used, but this data was large. Dr. Aty inspected carefully over 4000 accidents and for each analyzed the microscopic pattern of accident occurrence and the associated traffic flow parameters for up to 30 minutes preceding each accident. Dr. Aty could see how the condition on a freeway could change over time to form the situation that leads to an accident. He concluded that there are different flow regimes on highways and if these regimes could be identified in real-time and how they propagate, a solution could be invented to stop the impending accident. This opened the door to a new field in safety science and changed how we understand and predict traffic accidents. The work led to more refined and accurate algorithms by which the accident could be predicted by type, severity and condition. As data technology improved, Microwave Vehicle Detections Systems and AVI became more common, expanding the work to more innovation. Data is now available in excellent quality in most metropolitan areas with 20-60 sec intervals for all lanes. In addition, many arterial roads are equipped with Bluetooth detectors and traffic signals augmented with various traffic data capturing technologies. New vehicle-based detections with GPS and Smart Phone sensors that could be accessed by various apps are more common. Dr. Aty extended his technology to data generated from vehicles so it is more microscopic and applicable to other nations and include more roads. Data is generated from vehicles as they travel while connected through 5G/LTE to the infrastructure, cloud or smart phone generated. Dr. Aty used all these data simultaneously to guarantee coverage of the road network, improving the process and utilizing Machine learning algorithms in a comprehensive system that captures all data in real time and implement numerous algorithms trained for specific type of locations and accidents. In one of the latest developments, pedestrian crashes are predicted using the data generated from vehicles, CCTVs and Pedestrian Smart Phones, expecting the risk of pedestrian violations or unexpected road crossing. Using the same logic Pedestrian accidents could be eliminated. The system monitors the whole network, while suggesting the solution in real-time to the operator.

Dr. Aty has many notable contributions in research and practice in Transportation Safety and Technology and applications of AI. For example, multiple key projects that have been implemented and making key difference in

road safety: New concepts that are introduced and promoted over the last 20 years and now well accepted in practice: e.g., Pro Active Traffic Management (PATM), Real-Time Safety Risk Prediction, Transportation Safety Planning at the Macroscopic level. Many have been emulated around the world, implemented, and became NCHRP projects for inclusion in the Highway Safety Manual; the award-winning system for the USDOT Office of the Secretary Safety Challenge that won the first place (award received in Nov. 2019 from HE Elaine Chao USDOT secretary of Transportation), has been implemented in Florida, USDOT has included it in an RFP for other jurisdictions to implement, and received more USDOT funding to add more features to the system, implemented at TMC by FDOT. The system is approved for provisional patent and published (patent pending); work in innovative intersection designs is used in the FL Manual on Intersection Control Evaluation. Also invented and evaluated a new intersection design to accommodate high traffic volumes while reducing conflicts, and extensive work on Diverging Diamond Interchanges, resulting in FL converting 35 intersections to DDI; major work for the Highway Safety Manual new version as well as ongoing relevant NCHRP work; first more than 15 years ago to realize the safety challenges with toll plazas, investigated and suggested solutions that are now all implemented, and developed almost 8% of the Crash Modification Factors (CMFs) in the FHWA's CMFs Clearinghouse and a CMF Manual for Florida.

Additionally, multiple key projects that have been implemented and making a big difference beyond safety: machine learning models predict intersections' traffic movements and SPaT data for up to 5 cycles in the future. FDOT is using them to substitute the need for cameras and computer vision system at many intersections, thus saving substantial funds. This advancement is key for more efficient Adaptive signals and vehicle to infrastructure connectivity; key player in implementing transportation technology in Florida. For example, brought \$11.9 FHWA ATCMTD grant to research and deploy CV technology, Autonomous shuttles and pedestrian safety system to east Orange county; technology development, a multi driving simulation system for CAV testing, and 3 software safety systems based on data analytics, AI and computer vision, Real-Time Safety management, ARCIS, NMEDS.

On the international level, Dr. Aty is an Honorary Professor at Queensland University of Technology, Australia and Hanyang University, Korea, and Fellow at Loughborough University, UK. Internationally, implemented and advised in many key projects: e.g., development of the Advanced Traffic and Safety Management System in Abu Dhabi; main person in developing the Shanghai strategic safety plan, resulted in almost 50% reduction in fatalities; impacted the implementation of ATM in Sweden; provided advise to the Transport Research Forum (OECD countries) and PIARC. Dr. Aty is Foreign Advisor to Metropolitan Transportation Commission, Republic of Korea.

Dr. Aty is a member of the Academy of Science, Engineering and Medicine of Florida (ASEMFL). He is an Associate Editor for the *ASCE Journal of Transportation Part A: Systems and Transportation Research Interdisciplinary Perspectives*, and Executive Associate Editor for *Analytic Methods in Accident Research*. He is a member of the Editorial Boards of the ITS Journal, Transportation Research Part C and the International Journal of Sustainable Transportation, Fellow of both ASCE and ITE, and member of multiple TRB Committees. He is the Chair of the ASCE Transportation Safety Committee. A member of the Board of Directors (2020-2022) International Road Federation, Washington DC, and a delegate of the National Safety Council (2021-2023). He is One of 3 founders of the Central Florida Automated Vehicles Partnership, Member, Orange County's Mayor expert panel, 2030 Orange County Sustainable Operations and Resilience Action Plan.

In 2003, he was selected as UCF's Distinguished Researcher, and in 2007 as UCF's Outstanding Graduate Teacher. He has received multiple research awards from the College of Engineering & Computer Science in 2003, 2008, 2010 and 2012, including the Dean's Advisory Board award. He and his students received multiple awards for their papers, PhD and MS theses and research from ASCE, TRB, CUTC, WCTR, ITS and ITE. Dr. Aty has received the 2020 Roy Crum Distinguished Service Award from TRB of the National Academies, National Safety Council's Distinguished Service to Safety Award, Francis Turner award from ASCE for his "outstanding leadership in the field of road safety nationally and internationally". He has also received the 2019 Transportation Safety Council Edmund Ricker Award (ITE) and the Lifetime Achievement Safety Award from ARTBA in 2019. He has also received multiple International awards including the prestigious Prince Michael International Road Safety Award, London 2019.

<sup>1</sup> <https://www.youtube.com/watch?v=ID5PpVTFJ5o&feature=youtu.be>

<sup>2</sup> <https://www.bts.gov/newsroom/us-transportation-secretary-announces-solving-safety-visualization-challenge-winner>

# Mohamed A. Abdel-Aty, Ph.D., P.E., F.ASCE, F.ITE, ASEM FL

Pegasus Distinguished Professor

Trustee Endowed Chair

<https://www.cece.ucf.edu/aty/>

## SUMMARY CURRICULUM VITAE

### FIELDS OF EXPERTISE

Traffic Safety data, design, performance, analysis, evaluation, management and planning, Intelligent Transportation Systems, Connected Vehicles, Automated vehicles, Active Traffic Management, Traffic and signal prediction, Traffic Simulation, Machine Learning, Statistical and Econometrics Applications in Transportation Engineering.

### EDUCATION

*Ph.D.* in Civil Engineering (Transportation), September 1995, University of California, Davis.

*M.Sc.* in Civil Engineering (Transportation), July 1991, Alexandria University.

*B.Sc.* in Civil Engineering (Honors, Ranked in top 1%), June 1985, Alexandria University.

### EMPLOYMENT

- *Chair*, Department of Civil, Environmental & Construction Engineering (Fall 2013- present), University of Central Florida
- *Professor* of Civil Engineering (8/1995 – present): Civil, Environmental & Construction Engineering Dept., University of Central Florida
- *Trustee Endowed Chair, Pegasus Professor, Director*, Future City Initiative

### HONORS AND AWARDS

- **Distinguished Service to Safety Award**, the most prestigious award given to individuals by the National Safety Council, 2020.
- **Roy W. Crum Distinguished Service Award, Transportation Research Board, The National Academies, 2020.**
- Elected member of the Academy of Science, Engineering and Medicine of Florida (ASEMFL), 2020.
- **Prince Michael International Road Safety Award**, Dec. 2019. Considered as the Oscars of road safety!
- Winner, USDOT Solving for Safety Visualization Challenge, **Real-time crash risk visualization using integrated tools for traffic safety evaluation and management, November 2019.**  
<https://www.bts.gov/newsroom/us-transportation-secretary-announces-solving-safety-visualization-challenge-winner>
- Achievement Certificate, Elsevier, 300,000 publications downloaded, Science Direct, Oct. 2019.
- **Lifetime Achievement Safety Award**, American Road & Transportation Builders Assoc (ARTBA), 2019
- **2019 Transportation Safety Council Edmund R. Ricker Individual Award, Institute of Transportation Engineering (ITE)**
- **Francis C. Turner award, ASCE, 2019**  
for his “outstanding leadership in the field of road safety nationally and internationally”
- MetroLAB Network, Innovation of the Month, Jan. 2019.
- Korean Society of Transportation, **2018 Achievement Award**, Dec. 2018  
“your many innovative ideas that changed much of the safety research and practice as one of the top safety researchers that are recognized worldwide”
- Institute of Traffic Engineering, Shanghai, 2018 **Excellence Traffic Safety Improvement Service Award.**  
“The award is based on your credentials as a world known traffic safety expert”
- University 2014 award for “Faculty Excellence in Mentoring Doctoral Students”, recipient in the disciplinary grouping of “Engineering, Physical Sciences, and Life Sciences”, March 2015.

- **University Excellence in Graduate Teaching**, UCF, 2008.
- **University Distinguished Researcher**, University of Central Florida, 2003.

### LEADERSHIP SUMMARY

- Founder, Smart City MS, first dedicated MS degree in Smart Cities in the US.
- UCF Transportation Science and Technology under Dr. Aty's leadership ranked 29 in the world and 5<sup>th</sup> in the US, ARWU (Shanghai ranking), 2020.
- UCF Civil Engineering under Dr. Aty's leadership ranked in top 40 in the US, ARWU, Shanghai rank, 2020.
- Editor-in-Chief (July 2013 – 2021), Accident Analysis and Prevention, top safety Journal, Elsevier
- Editor Emeritus, Accident Analysis and Prevention, current.
- Chair, Transportation Safety Committee, ASCE T&DI, 2018-present.
- Executive Associate Editor, Analytic Methods in Accident Research (AMAR)
- Associate Editor, Journal of Transportation Engineering: Systems, ASCE, 2021-present.
- Member Board of Directors (2020-2022) International Road Federation, Washington DC.
- Board of Delegates, National Safety Council (2021-2023)

### PATENTS, Software, Innovation

- Real-Time Pro-active Traffic Safety Management UCF System including Operator and Decision Making Components, Provisional **Patent**, approved provisional patent application number 62/959,473 filed January 10, 2020
- Patent Pending Application No.: 17/248,142, Filing Date: 1/11/2021
- Real-Time Pro-active Traffic Safety Management UCF System including Operator and Decision Making Components, Software and User Manual **Copyright**, UCF CPY No.: 34291  
<https://www.youtube.com/watch?v=ID5PpVTFJ5o&feature=youtu.be>
- Crash Predictions for Expedited Detection (CPED), TMC system currently deployed at FDOT.
- Future City Initiative, U.S. Trademark Application Serial No. 88/768707
- Smart and Safe Transportation, U.S. Trademark Application Serial No. 88/768739
- Automated Roadway Conflicts Identification System (ARCIS), Road Safety using Computer Vision, used by 7 universities and private industry.
- Near Miss Event Detection System (NMEDS), Automatic conflict Analytics using computer vision and Machine learning.

### PROFESSIONAL SOCIETY MEMBERSHIPS & ACTIVITIES

- Transportation Research Board, National Research Council, National Academy of Sciences, long time member 3 committees
- International Advisor, Ministry of Land, Infrastructure and Transport, Korea, 2021-2023.
- Advisor, Association of Bay Area Governments, Metropolitan Transportation Commission, CA, current.
- Senior technical counselor to Saudi National Safety Council
- Advisor, PIARC's Special Project "Smart Roads Classification (SRC), World Road Association and Polytechnic Valencia, Spain.
- ITF/OECD Roundtable on Artificial Intelligence in Road Traffic Crash Prevention, OECD, 2021
- Member, Orange County FL Sustainability & Resilience Committee, 2020.
- Member Italy National Promotion Commission for Associate and full Professors in Transportation and Infrastructure sectors (2016/17).
- Visiting Professor: Hanyang University, Korea; KSU and Dammam Universities, Saudi Arabia; Nile University, Egypt; Tongji, BJTU, Central South Universities, China; QUT, Australia.
- Member Advisory Board, College of Engineering, Tongji University.
- Institute of Advanced Studies (IAS) Fellow, Loughborough University, UK



## PROJECTS

Seventy four projects, total funding at UCF of \$22.8 million of which \$18.5 million as **Principal Investigator** (PI) or sole (PI). Source of funding: USDOT Office of the Secretary, FHWA, FHWA ATCMTD; multiple USDOT UTCs, NCHRP's National Academy of Sciences, FTA, FDOT, CDOT, MetroPlan Orlando, CFX, GOAA, AIT/FIA foundation.

## SUPERVISION OF GRADUATE STUDENTS

- Supervised to completion (*as major Professor*) 35 PhD Dissertations. Currently supervising 18 more PhD students. Twice best University dissertation (2006 and 2016). Co-Advisor or External on 13 dissertations at other Universities in Singapore, Canada, Belgium, India, Egypt and US.
- Supervised to completion 60 MS theses.
- More than 20 former students are professors in PennState, CalPoly, LSU, Wyoming, WV, Kentucky, Cairo, Alexandria, Sharjah, King Saud, Tongji, Beijing, Central South, Hanyang in Korea, etc. Professionals in leadership positions, FDOT, CalTrans, VA DOT, SC DOT etc. Former student Albinder Dhindsa founded a logistics company "Grofers" in India, a several hundred million dollars company.

## MEDIA

**16 TV interviews**

**4 Radio interviews**

**26 News articles, including:**

## PUBLICATIONS

- To date total of 713 publications, of which 367 journal publications in top high Impact Journals.
- More than 10 best papers awards in ASCE J. of Transp Eng, TRB and WCTR international conference.
- More than 30 best cited papers
- Top 4 cited TRB papers in 2019, and among 8 most prolific TRB authors last 10 years.
- Publons, Web-of Science, top 0.1% cited authors globally, 2020.
- Ranked by Microsoft Academic as the world 2<sup>nd</sup> most impactful author in Transport Engineering in 2020  
<https://academic.microsoft.com/topic/22212356/authors?pi=1>
- Top 50 most Cited Civil Engineers in the US and Top 150 worldwide, Elsevier and Shanghai University
- Top author in Highway Accidents and Accident Prevention, Scopus, last 5 years
- Top author in Traffic Safety, Web of Science, last 5, 10 and 15 years
- 347 refereed conference and other papers, 1 edited book and 4 book chapters, 4 invited papers.

## CITATIONS

Google Scholar in Oct. 2021 produced the following:

Citations: 22,200

h-Index: 80

**h-Index last 5 years 67, highest among Transportation Scholars.**

i10-index: 286

Science Direct: Papers downloaded > 370,000 times

Newsflo: Media mentions: 45

## PRESENTATIONS

- Delivered 27 Keynote and plenary speeches at major international conferences around the world including in US, Belgium, Brazil, China, Greece, Korea, Turkey, KSA, Jordan, Qatar, and UAE.
- Delivered more than 240 presentations at conferences or invited.
- Chaired major international conferences in the US, China and Egypt.

# Mohamed A. Abdel-Aty, Ph.D., P.E., F.ASCE, F.ITE, ASEM FL

<http://www.cece.ucf.edu/people/aty/>

## Important papers (370 publications in journals)

1. Li P., Abdel-Aty M., Islam Z. (2021) Driving Maneuvers Detection Using Semi-supervised LSTM and Smartphone Sensors, *Journal of the Transportation Research Board*.  
<https://journals.sagepub.com/doi/10.1177/03611981211007483>
2. Zhang S., Abdel-Aty M., Wu Y., Zheng O. (2021) Pedestrian Crossing Intention Prediction at Red-Light Using Pose Estimation, *IEEE Transactions on Intelligent Transportation Systems*,  
<https://doi.org/10.1109/TITS.2021.3074829>
3. Abdelraouf A., Abdel-Aty M., Yuan J. (2021) Utilizing Attention-Based Multi-Encoder-Decoder Neural Networks for Freeway Traffic Speed Prediction *IEEE Transactions on ITS*,  
<https://ieeexplore.ieee.org/document/9535259>
4. Yue L, Abdel-Aty M., Wu Y., Yuan J. (2020) An Augmentation Function for Active Pedestrian Safety System Based on Crash Risk Evaluation, *IEEE Transactions on Vehicular Technology*, 69(11), art. no. 9169829, pp. 12459-12469, Nov. 2020.  
<https://ieeexplore.ieee.org/abstract/document/9169829>
5. Cai Q., Abdel-Aty M., Yuan J, Lee J. (2020) Real-Time Crash Prediction on Expressways Using Deep Generative Models, *Transportation Research Part C: Emerging Technologies*, 117, 102697. <https://doi.org/10.1016/j.trc.2020.102697>
6. Yuan J, Abdel-Aty M., Yue L., Cai Q. (2020) Modeling Real-Time Cycle-Level Crash Risk at Signalized Intersections Based on High-Resolution Event-Based Data, *IEEE Transactions on Intelligent Transportation Systems*, available on line.  
<https://doi.org/10.1109/TITS.2020.2994126>
7. Shi Q. and Abdel-Aty M. (2015) Big Data applications in real-time traffic operation and safety monitoring and improvement on urban expressways, *Transportation Research C*, Vol 58 part B, pp 380-394. Cited 310 times
8. Ahmed M. and Abdel-Aty M. (2013) A Data Fusion Framework for Real-Time Risk Assessment on Freeways, *Transportation Research Part C, Emerging Technologies*, Volume 26, January 2013, Pages 203-213.
9. Park P. and Abdel-Aty M. (2011) A Stochastic Catastrophe Model using Two-Fluid Model Parameters to Investigate Traffic Safety on Urban Arterials, *Accident Analysis & Prevention*, Elsevier, Vol. 43, Issue 3, pp. 1267-1278.
10. Abdel-Aty M. and Radwan E. (2000). Modeling Traffic Accident Occurrence and Involvement, *Accident Analysis & Prevention Journal*, Elsevier, **Vol. 32, No. 5**, pp. 21-30. **Cited 970 times**

# Mohamed A. Abdel-Aty, Ph.D., P.E., F.ASCE, F.ITE, ASEM FL

<http://www.cece.ucf.edu/people/aty/>

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## JOURNAL PUBLICATIONS

1. Ma W., He Z., Wang L., Abdel-Aty M., Yu C. (2021), Active Traffic Management Strategies for Expressways based on Crash Risk Prediction of Moving Vehicle Groups, *Accident Analysis and Prevention*, accepted Sep. 2021.
2. Gong Y., Abdel-Aty M. (2021) Using Machine Learning to Estimate Pedestrian and Bicyclist Count of Intersection by Bluetooth Low Energy, *ASCE Journal of Transportation Engineering, Part A Systems*, Sep. 2021.
3. Li Y., Li M., Yuan J., Lu J., Abdel-Aty M. (2022) Analysis and prediction of intersection traffic violations using automated enforcement system data, *Accident Analysis and Prevention*, 162, 106422. <https://doi.org/10.1016/j.aap.2021.106422>
4. Abdelraouf A., Abdel-Aty M., Yuan J. (2021) Utilizing Attention-Based Multi-Encoder-Decoder Neural Networks for Freeway Traffic Speed Prediction *IEEE Transactions on ITS*, accepted August 2021.
5. Cai Q., Abdel-Aty M., Mahmoud N., Ugan J., Al-Omari M. (2021) Developing a Grouped Random Parameter Beta Model to Analyze Drivers' Speeding Behavior on Urban and Suburban Arterials with Probe Speed Data, *Accident Analysis and Prevention*, 2021, 161, 106386.
6. Wang L., Wang K., Ma W., Abdel-Aty M., Li L. (2021) Real-Time Safety Analysis for Expressways Considering the Heterogeneity of Different Segment Types, *Journal of Safety Research*, accepted July 2021.
7. Mahmoud N., Abdel-Aty M., Cai Q., Zheng O. (2021) Vulnerable Road Users' Crash Hotspot Identification on Multi-Lane Arterial Roads Using Estimated Exposure and Considering Context Classification, *Accident Analysis and Prevention*, vol. 159, Sep 2021. <https://doi.org/10.1016/j.aap.2021.106294>
8. Ugan J., Abdel-Aty M., Cai Q., Mahmoud N., Al-Omari M. (2021) Effect of Various Speed Management Strategies on Bicycle Crashes for Urban Roads in Central Florida, *Journal of the Transportation Research Board*, June 2021.
9. Xiao G., Lee J., Jiang Q., Huang H., Abdel-Aty M., Wang L. (2021) Safety Improvements by Intelligent Connected Vehicle Technologies: A Meta-Analysis Considering Market Penetration Rates, *Accident Analysis and Prevention*, 2021, 159, 106234. <https://doi.org/10.1016/j.aap.2021.106234>
10. Zhang S., Abdel-Aty M., Wu Y., Zheng O. (2021) Pedestrian Crossing Intention Prediction at Red-Light Using Pose Estimation, *IEEE Transactions on Intelligent Transportation Systems*, <https://doi.org/10.1109/TITS.2021.3074829>
11. Al-Omari M., Abdel-Aty M., Cai Q. (2021) Crash Analysis and Development of Safety Performance Functions for Florida Roads in the Framework of the Context Classification System, *Journal of Safety Research*, available on line Aug. 2021. <https://doi.org/10.1016/j.jsr.2021.08.004>
12. Alver Y., Onelcin P., Ceckli A., Abdel-Aty M. (2021) Evaluation of Pedestrian Critical Gap and Crossing Speed at Midblock Crossing Using Image Processing, *Accident Analysis and Prevention*, 156, 106127.

13. Kim H., Kwon K., Park N., Park J., Abdel-Aty M. (2021) Crash-and simulation-based safety performance evaluation of freeway rest area, *Sustainability*, 2021, 13(9), 4963.
14. Lee J., Mao, S., Abdel-Aty, M., Lian, Y., Yue, L., Yun, I. (2021). Association Between Truck Crashes Due to Mechanical Failure and Truck Age. *Journal of Advanced Transportation*, vol. 2021, Article ID 8857458, 7 pages.  
<https://www.hindawi.com/journals/jat/2021/8857458/>
15. Lee J., Mao S., Abdel-Aty M., Fu W. (2021) The Use of Bivariate Random-Parameter Probit Model to Analyze the Severity of Highway Traffic Crashes Involving School-Age Children, *Journal of the Transportation Research Board*, accepted March 2021.
16. Al-Omari M., Abdel-Aty M. (2021) Evaluation of a New Intersection Design “Shifting Movements”, *Journal of the Transportation Research Board*, accepted March 2021.
17. Yuan J., Abdel-Aty M., Fu J., Yue L., Eluru N. (2021) Developing safety performance functions for freeways at different aggregation levels using multi-state microscopic traffic detector data, *Accident Analysis and Prevention*, 151, 105984
18. Li P., Abdel-Aty M., Islam Z. (2021) Driving Maneuvers Detection Using Semi-supervised LSTM and Smartphone Sensors, *Journal of the Transportation Research Board*.  
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19. Mahmoud N., Abdel-Aty M., Cai Q. (2021) Factors Contributing to Operating Speeds on Arterial Roads by Context Classifications, *ASCE Journal of Transportation Engineering*, Part A: Systems, 147(8): 04021040
20. Abdelrahman A., Abdel-Aty M., Yuan J., Al-Omari M. (2021) Sytematic Safety Evaluation of Diverging Diamond Interchanges Based on Nationwide Implementation Data, *Journal of the Transportation Research Board*.  
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22. Mahmoud N., Abdel-Aty M. Cai Q., Yuan J. (2021) Estimating Cycle-Level Real-Time Traffic Movements at Signalized Intersections, *Journal of Intelligent Transportation Systems: Technology, Planning, and Operations*, accepted Jan. 2021.  
<https://www.tandfonline.com/doi/full/10.1080/15472450.2021.1890072>
23. Mahmoud N., Abdel-Aty M., Cai Q. (2021) Predicting Cycle-Level Traffic Movements at Signalized Intersections Using Machine Learning Models, *Transportation Research Part C: Emerging Technologies*, 124, art. no. 102930.  
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25. Islam Z., Abdel-Aty M., Cai Q., Yuan J. (2021) Crash Data Augmentation Using Variational Autoencoder, *Accident Analysis and Prevention*, Volume 151, March 2021, 105950.  
<https://doi.org/10.1016/j.aap.2020.105950>
26. Islam Z., Abdel-Aty M. (2021) Real-Time Vehicle Trajectory Estimation Based on Lane Change Detection Using Smartphone Sensors, *Journal of the Transportation Research Board*. <https://journals.sagepub.com/doi/10.1177/0361198121990681>

27. Li P., Abdel-Aty M., Yuan J. (2021) Using Bus Critical Driving Events as Surrogate Safety Measures for Pedestrian and Bicycle Crashes Based on GPS Trajectory Data, *Accident Analysis and Prevention*, Vol 150, February 2021, 105924.  
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28. Rahman H., Abdel-Aty M., Wu Y. (2021) A Multi-Vehicle Communication System to Assess the Safety and Mobility of Connected and Automated Vehicles, *Transportation Research Part C: Emerging Technologies*, Volume 124, March 2021, 102887.  
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29. Iraganaboina N., Bhowmik T., Yasmin S., Eluru N., Abdel-Aty M. (2021) Evaluating the Influence of Information Provision (When and How) on Route Choice Preferences of Road Users in Greater Orlando: Application of a Regret Minimization Approach, *Transportation Research Part C: Emerging Technologies*, Vol. 122, January 2021, 102923.  
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30. Li P., Abdel-Aty M., Cai Q., Islam Z. (2020) A Deep Learning Approach to Detect Real-Time Vehicle Maneuvers Based on Smartphone Sensors, *IEEE Transactions on Intelligent Transportation Systems*, accepted Oct. 2020.
31. Zhang S., Abdel-Aty M. (2020) Prediction of Pedestrians' Near-accident Events at Signalized Intersections Using Gated Recurrent Unit (GRU), *Accident Analysis and Prevention*, Crash Precursors and Surrogate Measures of Safety: Measurement Technology, Theory and Applications, 148, 105844.
32. Zhang S., Abdel-Aty M., Cai Q., Li P., Ugan J. (2020) Prediction of Pedestrian-Vehicle Conflicts at Signalized Intersections Based on Long Short-Term Memory Neural Network, *Accident Analysis and Prevention*, Special issue on Road Safety under the Environment of Intelligent Connected Vehicles, 148, 105799.
33. Rahman H., Abdel-Aty M. (2020) Application of Connected and Automated Vehicles in a Large Scale Network by Considering V2V and V2I Technology, *Journal of the Transportation Research Board*, 0361198120963105.
34. Park JY., Abdel-Aty M. (2021) Application of Random Effects Nonlinear Model for Analyzing Motorized and Non-Motorized Traffic Safety Performance, *ASCE Journal of Transportation Engineering*, Part A: Systems, 147(1): 04020147.  
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37. Gong Y., Abdel-Aty M., Yuan J., Cai Q. (2020) Multi-Objective Reinforcement Learning Approach for Improving Safety at Intersections with Adaptive Traffic Signal Control, *Accident Analysis and Prevention*, Vol 144, 105655. ,  
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39. Abdel-Aty M., Wu Y., Saad M., Rahman M. (2020) Safety and Operational Impact of Connected Vehicles' Lane Configuration on Freeway Facilities with Managed Lanes, *Accident Analysis and Prevention* 144, Special issue on Road Safety under the Environment of Intelligent Connected Vehicles, Article No: 105616, PII: S0001-4575(20)30094-4
40. Yuan J, Abdel-Aty M., Yue L., Cai Q. (2020) Modeling Real-Time Cycle-Level Crash Risk at Signalized Intersections Based on High-Resolution Event-Based Data, *IEEE Transactions on Intelligent Transportation Systems*, available on line.  
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42. Yue L., Abdel-Aty M., Wu Y., Hasan S., Zheng O. (2020) Identifying Pedestrian Crash Contributing Factors Using Association Analysis and Their Implications for Development of Active Pedestrian Safety System, *Journal of the Transportation Research Board*, [Vol 2674, Issue 8, 2020.](https://journals.sagepub.com/doi/10.1177/0361198120925472)  
<https://journals.sagepub.com/doi/10.1177/0361198120925472>
43. Cai Q., Abdel-Aty M., Castro S. (2021) Explore Effects of Bicycle Facilities and Exposure on Bicycle Safety at Intersections, *International Journal of Sustainable Transportation* Vol. 15, issue 8, pp. 592-603.  
<https://www.tandfonline.com/doi/full/10.1080/15568318.2020.1772415>
44. Lee J., Abdel-Aty M., Cai Q. (2020) Investigation of Safety-in-numbers for Pedestrians and Bicyclists at a Macroscopic Level with Various Exposure Variables, *Journal of the Transportation Research Board*, 0361198120953795.
45. Cai Q., Abdel-Aty M., Yuan J, Lee J. (2020) Real-Time Crash Prediction on Expressways Using Deep Generative Models, *Transportation Research Part C: Emerging Technologies*, 117, 102697. <https://doi.org/10.1016/j.trc.2020.102697>
46. Li P., Abdel-Aty M., Cai Q., Yuan C. (2020) The Application of Novel Connected Vehicles Emulated Data on Real-Time Crash Potential Prediction for Arterials, *Accident Analysis and Prevention*, Special issue on Road Safety under the Environment of Intelligent Connected Vehicles, 144. <https://doi.org/10.1016/j.aap.2020.105658>
47. Yue L., Abdel-Aty M. (2020) Influence of Pedestrian-to-Vehicle Technology on Driver Response and Safety Benefits Considering Pre-Crash Scenario Heterogeneity, *Transportation Research Part F: Traffic Psychology and Behaviour*, 73, 50-65.
48. Xing L., Abdel-Aty M., Wu Y., Yuan J., He J. (2020) Time-varying Analysis of Traffic Conflicts at the Upstream Approach of Toll Plaza, *Accident Analysis and Prevention*, 141, 105539.
49. Al-Omari M., Abdel-Aty M., Lee J., Yue L., Abdelrahman A. (2020) Safety Evaluation of Median U-Turn Crossover-Based Intersections, *Journal of the Transportation Research Board*, 0361198120921158.
50. Montella A., Guida C., Mosca J., Lee J., Abdel-Aty M. (2020) Systemic Approach to Improve Safety of Urban Unsignalized Intersections: Development and Validation of a Safety Index, *Accident Analysis and Prevention*, 141, 105523
51. Li Y., Abdel-Aty M., Yuan J., Cheng Z., Lu J. (2020) Analyzing Traffic Violation Behavior at Urban Intersections: A Spatial-Temporal Kernel Density Estimation Approach Using Automated Enforcement System Data, *Accident Analysis and Prevention*, 141, 105509.  
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53. Yue L., Abdel-Aty M. (2020) In-Depth Approach for Identifying Crash Causation Patterns and its Implications for Pedestrian Crash Prevention, *Journal of Safety Research*, 73, pp. 119-132
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57. Formosa N., Quddus M., Ison S., Abdel-Aty M., Yuan J. (2020) Predicting real-time traffic conflicts using deep learning, *Accident Analysis and Prevention*, 136, 105429.
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65. Wang L., Zhong H., Ma W., Abdel-Aty M. and Park J. (2019) How Many Crashes Can Connected Vehicle and Automated Vehicle Technologies Prevent: a Meta-analysis, *Accident Analysis and Prevention*, 136, 105299.
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372. Islam Z., Abdel-Aty M., Cai Q., Yuan J. (2022) Crash Data Augmentation Using Variational Autoencoder, 101<sup>st</sup> Annual Meeting of the *Transportation Research Board*, TRBAM-22-02958, Washington DC, January 2022.
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  379. Wang Z., Yue L., Abdel-Aty M., Zhu J., Zheng O., Zaki M. (2022) Cooperative Driving at Non-Signalized Intersection in a Mixed Traffic Environment: A Co-Simulation Based Multi-Driver Driving Simulator Study, 101<sup>st</sup> Annual Meeting of the *Transportation Research Board*, TRBAM-22-04318, Washington DC, January 2022.
  380. Anisha A., Abdel-Aty M., Abdelraouf A., Wu Y., Islam Z., Zheng O. (2022) Automated Vehicle to Vehicle Conflict Analysis at Signalized Intersections by Camera and LiDAR Sensor Fusion, 101<sup>st</sup> Annual Meeting of the *Transportation Research Board*, TRBAM-22-03060, Washington DC, January 2022.
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  406. Wu Y., Abdel-Aty M., Zhang O., Yuan J. (2021) Road Safety Diagnostics using Roadside Video Data Based on Car Pose Detection, 100<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 21-00964, Washington DC, January 2021.
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  408. Islam Z., Abdel-Aty M. (2021) Sensor-based Transportation Mode Recognition Using Variational Autoencoder: Application of Smart Phone Data in the Context of P2V, 100<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 21-00401, Washington DC, January 2021.
  409. Mahmoud N., Abdel-Aty M., Cai Q., Yuan Q. (2021) Predicting Cycle-Level Traffic Movements at Signalized Intersections Using Machine Learning Models, 100<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 21-00283, Washington DC, January 2021.
  410. Rahman H., Abdel-Aty, Wu Y. (2021) Comparing the Benefits of Connected and Automated Vehicles to Only Automated Vehicles by Considering a Multi-Vehicle Communication System, 100<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 21-02902, Washington DC, January 2021.

411. Al-Omari. M., Abdel-Aty M. (2021) Evaluation of a New Intersection Design “Shifting Movements”, 100<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 21-00246, Washington DC, January 2021.
412. Abdelrahman A., Abdel-Aty M., Yuan J., Al-Omari M. (2021) Systematic Safety Evaluation of Diverging Diamond Interchanges Based on Nationwide Implementation Data, 100<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 21-00026, Washington DC, January 2021.
413. Abdelraouf A., Abdel-Aty M., Yuan J. (2021) Predicting Freeway Traffic Speed using Attention-Based Multi-Encoder-Decoder Neural Networks, 100<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 21-03753, Washington DC, January 2021.
414. Cai Q., Abdel-Aty M., Yuan JH, Lee JY., Wu Y. (2020) Applying a Deep Learning Method to Balance Data for Real-Time Crash Prediction on Expressways, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-02940, Washington DC, January 2020.
415. Yuan JH., Abdel-Aty M., Yue L., Gong YB. (2020) Corridor-Level Real-Time Crash Risk Prediction Using Spatial-Temporal LSTM, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-03166, Washington DC, January 2020.
416. Wu Y., Abdel-Aty M., Zeng O., Cai Q. and Zhang S. (2020) Automated Safety Diagnosis Based on Unmanned Aerial Vehicles Videos and Deep Learning Algorithm Transportation Research Board, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-03570, Washington DC, January 2020.
417. Rahman MH., and Abdel-Aty M. (2020) Application of Connected and Automated Vehicles in a Large Scale Network by Considering V2V and V2I Technology, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-03349, Washington DC, January 2020.
418. Yue L., Abdel-Aty M., Wu Y., Zheng O. (2020) In-Depth Approach for Identifying Crash Causation Patterns and its Implications for the Development of Active Pedestrian Safety Systems, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-01440, Washington DC, January 2020.
419. Yue L., Abdel-Aty M., Wu Y., Yuan JH. (2020) An Augmentation Function for Active Pedestrian Safety System Based on Crash Risk Evaluation, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-01021, Washington DC, January 2020.
420. Gu X., Abdel-Aty M., Lee JY., Xiang Q. (2020) Investigation of Contributing Factors to Drivers’ Risk of Crash Involvement at Interchanges Using Quasi-Induced Exposure and Logistic Regression Approach, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-00144, Washington DC, January 2020.
421. Yuan JH., Abdel-Aty M., Yue L., Cai Q. (2020) Cycle-by-Cycle Crash Risk Analysis at Signalized Intersections by Considering Shockwave Characteristics, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-01626, Washington DC, January 2020.
422. Rahman MS., Abdel-Aty M., Wu Y. (2020) Traffic Safety and Operational Benefits of Connected and Automated Vehicle on Expressways: Application of Real-World Validated CAV Data, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-00261, Washington DC, January 2020.
423. Rahman MS., Abdel-Aty M. (2020) Traffic Safety Impacts of Dedicated Lanes for Connected Vehicle Platooning on Expressways, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-01094, Washington DC, January 2020.



424. Lee JY, Zhai X., Abdel-Aty M. Huang H. (2020) Macroscopic Analysis of Violations and Crashes Involving Driving Under the Influence of Alcohol or Drugs, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-02737, Washington DC, January 2020.
425. Lee JY, Abdel-Aty M. and Mao S. (2020) Bivariate Ordered Modeling of the Injury Severity Levels of Drivers and School-Age Child Passengers in Traffic Crashes, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-03523, Washington DC, January 2020.
426. Lee JY., Abdel-Aty M., Zhai X., Huang H. (2020) Hierarchical Analysis of Traffic Violations and Crashes: A Macroscopic Safety Analysis, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-01355, Washington DC, January 2020.
427. Lee JY, Abdel-Aty M., Cai Q. (2020) Investigation of Safety-in-numbers for Pedestrians and Bicyclists at a Macroscopic Level with Various Exposure Variables, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-03549, Washington DC, January 2020.
428. Wang L., Zhong H., Abdel-Aty M., Ma W., Park JY. (2020) Safety Benefit Analysis of Connected and Automated Vehicle Technologies Based on Meta-analysis, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-00285, Washington DC, January 2020.
429. Park JY., Abdel-Aty M., Wang L., Lee G., Hong J. (2020) Investigation of Associations between Multiple Freeway Roadway Characteristics and Freight Safety Performance, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-00618, Washington DC, January 2020.
430. Abdelrahman A., Abdel-Aty M., Lee JY., Yue L., Al-Omari M. (2020) Safety Analysis of Displaced Left-Turn Intersections, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-03379, Washington DC, January 2020.
431. Islam Z, Abdel-Aty M., Chowdhury D, Cai Q. (2020) Using Smartphone Sensors to Estimate Vehicle Trajectories and Detect Lane Changes in the Context of Connected Vehicles, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-00437, Washington DC, January 2020.
432. Gong Y., Abdel-Aty M., Yuan JH., Cai Q. (2020) Safety-Orientated Adaptive Traffic Signal Using Multi-Objective Deep Reinforcement Learning, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-01096, Washington DC, January 2020.
433. Saad M., Abdel-Aty M., Wu Y., Rahman MS. (2020) Safety and Operational Impact of Connected Vehicles' Lane Configuration Design on Freeway Facilities with Managed Toll Lanes, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-05543, Washington DC, January 2020.
434. Li P., Abdel-Aty M., Cai Q., Islam Z. (2020) Real-time Vehicle Maneuvers Detection based on Smartphone Sensors and Deep Learning, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-01654, Washington DC, January 2020.
435. Al-Omari, Abdel-Aty M., Lee JY., Yue L. (2020) Safety Evaluation of Median U-Turn Crossover-Based Intersections, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-01603, Washington DC, January 2020.
436. Yasmin S., Iraganaboina N., Bhowmik T., Eluru N., Abdel-Aty M. (2020) Evaluating the Influence of Information Provision on Route Choice Preferences of Road Users:

- Application of a Regret Minimization Approach, 99<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 20-00589, Washington DC, January 2020.
437. Yuan JH and Abdel-Aty M. (2019) Cycle-by-Cycle Crash Risk Prediction at Signalized Intersections by Using LSTM, ITS World Congress, Singapore, October 2019.
  438. Lee JY and Abdel-Aty M. (2019) Hierarchical Analysis of Speeding Behaviors, Violations, and Crashes Using Real-Time Speed Data from the National Performance Management Research Data Set in the United States, ITS World Congress, Singapore, October 2019.
  439. Saad M., Abdel-Aty M., Wu Y. and Rahman S. (2019) Safety Analysis of Managed Toll Lanes Considering Connected Vehicles, Road Safety & Simulation conference, Iowa, October 2019
  440. Morris M., Abdel-Aty M., Wu Y. and Yue L. (2019) Evaluating the Effectiveness of P2V Connected Vehicle Technologies in a Driving Simulator, Road Safety & Simulation conference, Iowa, October 2019.
  441. Abdel-Aty M., Yue L. and Wu Y. (2019) The Crash Avoidance Effectiveness of Advanced Driver Assistance Systems in Real-World Environment, International Conference on Transportation and Development, ASCE, June 9-12, 2019, Alexandria, VA.
  442. Abdel-Aty M., Saad M. and Wu Y. (2019) Safety Analysis of Managed Toll Lanes Considering Connected Vehicles, International Conference on Transportation and Development, ASCE, June 9-12, 2019, Alexandria, VA.
  443. Abdel-Aty M. and Lee JY. (2019) Bivariate Ordered Modeling of Crash Injury Severity Level of Drivers and School-Age Passengers, International Conference on Transportation and Development, ASCE, June 9-12, 2019, Alexandria, VA.
  444. Lee JY, Abdel-Aty M., and Chung WB, "Pedestrian safety in Florida: a comparative analysis of residents and visitors." 1st International Conference on Smart Tourism, Smart Cities and Enabling Technologies, May 1-4, 2019, Orlando
  445. Yue L., Abdel-Aty M., Lee JY. and Wu Y. Safety Benefits of Advanced Driver Assistant Systems and Intelligent Transportation Systems in Future Smart City. 1st International Conference on Smart Tourism, Smart Cities and Enabling Technologies, May 2019, Orlando.
  446. Yuan J and Abdel-Aty M. Arterial-Level Real-Time Crash Risk Prediction Using Deep Learning. 1st International Conference on Smart Tourism, Smart Cities and Enabling Technologies, May 2019, Orlando.
  447. Yue L., Abdel-Aty M. and Wu Y (2019) The Practical Effectiveness of Advanced Driver Assistance Systems at Different Roadway Facilities: System Limitation, Adoption and Usage, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-01119, Washington DC, January 2019.
  448. Lee JY, Abdel-Aty M. and El-Urfali A. (2019) The Safety Implications of the Conversion of Continuous Green T-Intersections back to Conventional T-Intersections, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-00233, Washington DC, January 2019.
  449. Lee JY and Abdel-Aty M. (2019) Safety Effects of Pavement Roughness for Freeways: A Comparative Analysis of Interstate Highways in Five States, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-00735, Washington DC, January 2019.
  450. Lee JY, Abdel-Aty M., De Blasis M., Wang XS and Mattei I. (2019) International Transferability of Macro-Level Safety Performance Functions: A Case Study of the United

- States and Italy, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-02530, Washington DC, January 2019.
451. Wang XS, Feng M., Lee JY and Abdel-Aty M. (2019) Transferability of Safety Performance Functions and Hotspot Identification for Freeways of the United States and China, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-04898, Washington DC, January 2019.
  452. Lee JY, Abdel-Aty M., Xu P. and Gong YB. (2019) Is the Safety-in-Numbers Effect still Observed in Areas with Low Pedestrian Activities?: A Case Study from Central Florida, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-00133, Washington DC, January 2019.
  453. Cai Q., Abdel-Aty M., Sun Y, Lee JY and Yuan JH. (2019) Applying Deep Learning and High-Resolution Data to Predict Crashes for Transportation Safety Planning, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-02685, Washington DC, January 2019.
  454. Wu Y., Abdel-Aty M., Wang L. and Rahman S. (2019) Improving flow and safety in low visibility conditions by applying connected vehicles and variable speed limits technologies, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-02734, Washington DC, January 2019.
  455. Yuan JH., Abdel-Aty M., Cai Q. and Lee JY. (2019) A Driving Simulator Study to Investigate Drivers' Lane Change Behavior on the Weaving Section of a Freeway with Managed Lane, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-01319, Washington DC, January 2019.
  456. Rahman S., Abdel-Aty M., Lee JY and Rahman H. (2019) Understanding the Safety Benefits of Connected and Automated Vehicles on Arterials' Intersections and Segments, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-00869, Washington DC, January 2019.
  457. Rahman S., Abdel-Aty M., Hasan S. and Cai Q. (2019) Applying Data Mining Techniques to Analyze the Pedestrian and Bicycle Crashes at the Macroscopic Level, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-00055, Washington DC, January 2019.
  458. Gu X., Abdel-Aty M., Xiang Q., Cai Q. and Yuan JH. (2019) Analyzing Crash Risk at Interchange Merging Areas using Aerial Data, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-00286, Washington DC, January 2019.
  459. Yuan JH and Abdel-Aty M. (2019) Real-Time Crash Risk Analysis for Signalized Intersections, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-03593, Washington DC, January 2019.
  460. Huang H., Zhou H., Chang F., Xu P. and Abdel-Aty M. (2019) Incorporating Spatial Effects into Temporal Dynamic of Traffic Fatality Risk: A Case Study on Lower States in the USA, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-03389, Washington DC, January 2019.
  461. Wang L., Abdel-Aty M., Ma W. and Hu J. (2019) Vehicle-Trajectory-based Real-time Safety, Analysis, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-02313, Washington DC, January 2019.
  462. Gong YB, Abdel-Aty M., Cai Q. and Rahman S. (2019) A Decentralized Network Level Adaptive Signal Control Algorithm by Deep Reinforcement Learning, 98<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 19-03479, Washington DC, January 2019.

463. Abdel-Aty M. and Wang L., Implementation of Ramp Metering to Improve Safety of Congested Expressway Weaving Segments, Road Safety on 5 Continents, Jeju, South Korea, May 16-18, 2018.
464. Abdel-Aty M., and Wang L., Exploring Microscopic Crash Mechanisms of Freeway-to-Freeway Interchange Ramps, Road Safety on 5 Continents, Jeju, South Korea, May 16-18, 2018.
465. Farid A., Abdel-Aty M. and Lee JY (2018). A Novel Approach for Calibrating Safety Performance Functions, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-00658, Washington DC, January 2018.
466. Farid A., Abdel-Aty M. and Lee JY (2018) Transferring and Calibrating Safety Performance Functions among Multiple States, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18- 00109, Washington DC, January 2018.
467. Cai Q., Abdel-Aty M., Lee JY and Huang H. (2018) Integrating Macro and Micro Level Safety Analyses: A Bayesian Approach Incorporating Spatial Interaction, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-00144, Washington DC, January 2018.
468. Park JY and Abdel-Aty M., Wu Y and Mattei I. (2018) Optimization of in-vehicle warning and assistance information design under reduced visibility in connected vehicle environment, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18- 00716, Washington DC, January 2018.
469. Wu Y., Abdel-Aty M., Park JY and Zhu JZ (2018) Effects of Connected-Vehicle Warning Systems on Rear-End Crash Avoidance Behavior under Fog Conditions, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18- 01064, Washington DC, January 2018.
470. Gong Y., Abdel-Aty M., Park JY and Ponnaluri R. (2018) Evaluation and Augmentation of Traffic Data from Private Sector and Bluetooth Detection System on Arterials, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18- 01590, Washington DC, January 2018.
471. Yuan JH., Abdel-Aty M., Wang L., Lee JY., Wang XS. And Yu RJ. (2018) Real-Time Crash Risk Analysis of Urban Arterials Incorporating Bluetooth, Weather, and Adaptive Signal Control Data, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-00590, Washington DC, January 2018.
472. Wang L., Abdel-Aty M. and Lee JY (2018) Safety Analytics for Integrating Crash Frequency and Real-Time Risk Modeling for Expressways, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-00800, Washington DC, January 2018.
473. Cai Q., Abdel-Aty M., Lee JY, Wang L. and Wang XS. (2018) Exploration of Macrolevel Effects for Segment and Intersection Crash Modeling, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-00618, Washington DC, January 2018.
474. Li J., Wang XS, Abdel-Aty M. and Y RJ (2018) Exploring the Transferability of Cross-Country Safety Performance Functions for Urban Arterials with Pooled Data, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-04325, Washington DC, January 2018.
475. Hasan S., Roy K., Hasnat M. and Abdel-Aty M. (2018) Sharing Real-Time Traffic

- Information with Travelers Using Social Media: An Analysis of Twitter Activities, Influence, and Effectiveness, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-03857, Washington DC, January 2018.
476. Fountas G., Anastasopoulos P. and Abdel-Aty M. (2018) Analysis of Accident Injury Severities Using a Time-Variant Correlated Random Parameters Ordered Probit Approach, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-03237, Washington DC, January 2018.
  477. Stylianou K., Dimitriou L. and Abdel-Aty M. (2018) Development of a Spatiotemporal Hybrid Conflict Severity Indicator on Urban Network, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-03363, Washington DC, January 2018.
  478. Yue L., Abdel-Aty M. and Wang L. (2018) Assessment of the Safety Benefits of Connected and Autonomous Vehicle Technologies, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-03482, Washington DC, January 2018.
  479. Saad M., Abdel-Aty M., Lee JY. And Wang L. (2018) Access Design Safety Analysis for Managed Lanes Including Accessibility Level and Weaving Length, accepted for presentation at 97<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 18-00860, Washington DC, January 2018.
  480. Abdel-Aty M. and Wang L. (2017) Implementation of Variable Speed Limits to Improve Safety of a Congested Expressway Weaving Segment in Microsimulation, 20th EURO Working Group on Transportation Meeting, EWGT 2017, 4-6 September 2017, Budapest, Hungary.
  481. Abdel-Aty M. And Wang L. (2017) Reducing Real-Time Crash Risk for Congested Expressway Weaving Segments using Ramp Metering, 5th IEEE International Conference on Models and Technologies for Intelligent Transportation Systems, MT-ITS 2017 - Proceedings 8005733, pp. 550-555, Naples, Italy, June 26-28.
  482. Wu Y., Abdel-Aty M. and Park JY (2017) Developing Rear-End Crash Risk Algorithm under Fog Conditions using Real-Time Data, 5th IEEE International Conference on Models and Technologies for Intelligent Transportation Systems, MT-ITS 2017 - Proceedings 8005736, pp. 568-573, Naples, Italy, June 26-28.
  483. Abuzwidah M. and Abdel-Aty M. (2017), Modelling of traffic safety of traditional mainline toll plazas, International Conference on Advances in Sustainable Construction Materials & Civil Engineering Systems (ASCMCES), Sharjah, April 2017.
  484. Wu Y., Abdel-Aty M., Cai Q., Lee JY and Park JY (2017) Rear-End Crash Risk Algorithm Under Fog Conditions Based on Kinematics Analysis, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-02271, Washington DC, January 2017.
  485. Shah M., Abdel-Aty M. and Lee JY (2017) Evaluation of Surrogate Measures for Pedestrian Exposure to Traffic Crashes at Intersections, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-03402, Washington DC, January 2017.
  486. Bustamante C., Abdel-Aty M. and Lee JY (2017) State- and Driver-Level Analyses of the Effects of the Child Restraint Law, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-05633, Washington DC, January 2017.
  487. Cai Q., Abdel-Aty M. and Lee JY (2017) Bayesian Joint Approach of Frequency and

- Proportion Modeling at Macro Level: Case Study of Crashes Involving Pedestrians or Bicyclists, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-03158, Washington DC, January 2017.
488. Chung WB, Abdel-Aty M. and Lee JY (2017) Viability of Land-Based Weather Station Data on Highways: National-Level and Region-Level Analyses, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-03994, Washington DC, January 2017.
  489. Lee JY, Abdel-Aty M., Huang H. and Cai Q. (2017), Intersection Safety Performance Functions with Macro-Level Data from Various Geographic Units, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-00932, Washington DC, January 2017.
  490. Cai Q., Abdel-Aty M., Lee JY and Eluru N. (2017) Comparative Analysis of Zonal Systems for Macro-level Crash Modeling: Census Tracts, Traffic Analysis Zones, and Traffic Analysis Districts, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-01200, Washington DC, January 2017.
  491. Lee JY, Abdel-Aty M. and Park JY (2017) Investigation of Traffic Crashes Caused by Driving Under the Influence near Colleges and Universities, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-00916, Washington DC, January 2017.
  492. Wang L., Abdel-Aty M., Wang X. and Yu R. (2016) Analysis and Comparison of Safety Models Using AADT, Hourly Traffic, and Microscopic Traffic, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-01165, Washington DC, January 2017.
  493. Wu Y., Abdel-Aty M., Park JY and Selby R. (2017) Analysis of the Impact of Fog Warning systems on Driver Behavior Under Reduced Visibility Conditions Using a Driving Simulator, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-02698, Washington DC, January 2017.
  494. Haleem K. and Abdel-Aty M. (2017) Safety Investigation of Combining Ramp Metering and Variable Speed Limits Strategies on Urban Freeways: A Simulation Study, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-01045, Washington DC, January 2017.
  495. Abuzwidah M. and Abdel-Aty M. (2017) Effects of Using High Occupancy Toll Lanes on Safety Performance of Freeways, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-06894, Washington DC, January 2017.
  496. Yasmin S., Eluru N., Wang L. and Abdel-Aty M. (2017) Joint Framework for Static and Real-Time Crash Risk Analysis, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-05406, Washington DC, January 2017.
  497. Stylianou K, Dimitriou L. and Abdel-Aty M. (2017) Investigating Rear-End Collision Potential at Signalized Urban Networks Based on Disaggregated Spatial Sensor Data, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-03330, Washington DC, January 2017.
  498. Alarifi S., AlKahtani K., Abdel-Aty M., Kher S., Mohammed A. and Almojil A. (2017) Safety Evaluation of a Main Corridor in a Developing Country Using a Survey Based Approach, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-03582, Washington DC, January 2017.
  499. Alkahtani K., Abdel-Aty M. and Lee JY (2017) Zonal-Level Safety Investigation of



- Pedestrian Crashes in Riyadh, Saudi Arabia, accepted for presentation at 96<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 17-06178, Washington DC, January 2017.
500. Wu Y and Abdel-Aty M. (2016) Crash Risk Analysis during Fog Conditions using Real-Time Traffic, Road Safety on 5 Continents, Rio de Janeiro, Brazil, May 2016.
  501. Wang L., Abdel-Aty M., Lee JY and Shi Q. (2016) Analysis of Real-time Crash Risk and Crash Frequency for Expressway Ramps Using Traffic, Geometric, Land-use, and Trip Generation Predictors, 14<sup>th</sup> World Conference on Transport Research, Shanghai, China, July 2016. Received Best Paper Award
  502. Park JY, Abdel-Aty M and Lee JY (2016) Evaluation of the Safety Effectiveness of Installing Roadside Barriers with different driver, vehicle, weather, and time of day conditions, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-0678, Washington DC, January 2016.
  503. Al Kaaf K. and Abdel-Aty M. (2016) Transferability of Safety Performance Functions between HSM and Two Countries: The Case of Urban Four-Lane Divided Roadways in Muscat, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-1666, Washington DC, January 2016.
  504. Alirezaei M., Onat N., Tatari O. and Abdel-Aty M. (2016) Impacts of Climate Change on Road Safety: System Dynamics Approach, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-0666, Washington DC, January 2016.
  505. Wang L., Abdel-Aty M., Shi Q. and Park JY. (2016) Predicting Expressway Weaving-Segment Crashes Using Bayesian Multilevel Logistic Regression, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-1103, Washington DC, January 2016.
  506. Park JY. and Abdel-Aty M. (2016) Using Generalized Nonlinear Models to Develop Crash Modification Factors for Multiple Cross Sectional Features of Urban Arterials, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-1673, Washington DC, January 2016.
  507. Wu Y., Abdel-Aty M., Lee JY and Wilson M. (2016) Crash Risk Analysis under Fog Conditions on Full Access Controlled Highways Using Real-Time Traffic Data, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-2137, Washington DC, January 2016.
  508. Cai Q., Lee JY, Eluru N. and Abdel-Aty M (2016) Macrolevel Pedestrian and Bicycle Crash Analysis Incorporating Spatial Spillover Effects in Dual-State Count Models, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-2469, Washington DC, January 2016.
  509. Al Amili S., Abdel-Aty M., Lee JY and Shi Q. (2016) Dynamic Hotspot Identification for Expressways Using Real-Time Traffic Data, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-3820, Washington DC, January 2016.
  510. Lee JY., Yasmin S., Eluru N., Abdel-Aty M. and Cai Q. (2016) Macroscopic Analysis of Crash Proportion by Mode: Fractional Split Multinomial Logit Modeling Approach, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-3848, Washington DC, January 2016.
  511. Lee JY and Abdel-Aty M. (2016) Exploring Zonal Level Bicycle Traffic Crashes and Hot

- Zone Identification, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-4000, Washington DC, January 2016.
512. Farid A., Abdel-Aty M., Lee JY., Eluru N. and Wang JH. (2016) Exploring Transferability of Safety Performance Functions: A Case Study of Rural Multilane Divided Highway Segments, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-5119, Washington DC, January 2016.
  513. Peng Y., Abdel-Aty M. and Shi Q. (2016) Examining the Impact of Reduced Visibility on Traffic Crash Risk Using Microscopic Traffic Parameters and Surrogate Safety Measures, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-3918, Washington DC, January 2016.
  514. Dong N., Huang H., Lee J., Gao M. and Abdel-Aty M. (2016) Macroscopic Hotspot Identification: Bayesian Spatiotemporal Interaction Approach, accepted for presentation at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-4515, Washington DC, January 2016.
  515. Alamili S., Abdel-Aty M., Lee JY (2016) Dynamic Hotspot Identification for Expressways using Real-Time Traffic Data, presented at 95<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 16-3820, Washington DC, January 2016.
  516. Shi Q. and Abdel-Aty M. (2015) On Ramp Closure Practices and Procedures: A Survey for Expressway Risk Management, 25<sup>th</sup> World Road Congress, Seoul, November 2-6, 2015.
  517. Park JY and Abdel-Aty M. (2015) Assessing Safety Effects of Changing Bike Lane Width Using Generalized Nonlinear Models in Cross-Sectional Analysis, 25<sup>th</sup> World Road Congress, Seoul, November 2-6, 2015.
  518. Park JY, Abdel-Aty M. and Wang JH. (2015) Development of Crash Modification Factors and Functions for Widening Shoulder Width on Rural Two-Lane Roadways, 25<sup>th</sup> World Road Congress, Seoul, November 2-6, 2015.
  519. Abuzwidah M. and Abdel-Aty M. (2015) Traffic Safety Assessment of Traditional Mainline Toll Plazas on Expressways, Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  520. Lee, J., Abdel-Aty, Shi, Q. (2015). Comprehensive DUI Crash Analysis Using Data from Multiple Sources. Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  521. Lee, J., Nam, B., Abdel-Aty, M. (2015). Examining the Relationship between Pavement Surface Conditions and the Crash Injury Severity. Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  522. Lee, J., Abdel-Aty, M., & Huang, H. (2015). Pedestrian Safety Data Analytics: Modeling and Screening for Residence and Crash Zones. Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  523. Wang JH, Abdel-Aty M., Selby R. and Strobbridge K. (2015) Comprehensive Safety Evaluation of Roadway Features at Intersections in Florida, Proceedings of the Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  524. Shi Q. and Abdel-Aty M. (2016) Traffic Operation and Safety: How Crashes Affect Congestion on Urban Expressways, Proceedings of the Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  525. Lee JY, Nam B., and Abdel-Aty M (2015) Examining the Relationship between

- Pavement Surface Conditions and Crash Injury Severity, Proceedings of the Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
526. Alirezaie M., Onat N., Tatari O. and Abdel-Aty M. (2015) A Dynamic Simulation Approach to Assess the Climate Change Impacts on Road Safety, Proceedings of the Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  527. Shi Q. and Abdel-Aty M. (2015) Urban Expressway Traffic Safety and Operation Evaluation and Improvement Using Big Data, Proceedings of the Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  528. Shi Q., Abdel-Aty M. and Lee JY. (2015) Analysis of Congestion's Impact on Urban Expressway Safety: A Bayesian Ridge Regression Approach, Proceedings of the Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  529. Alarifi S. and Abdel-Aty M. (2015) Safety Effectiveness of Conversion of Two-Way-Left-Turn Lanes into Raised Medians, Proceedings of the Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  530. Alarifi S., Alkahtani K., Abdel-Aty M., Kher S., Mohammad A. and Almojil A. (2015) Corridor Safety Evaluation in Saudi Arabia using User and Expert Survey Approach, Proceedings of the Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  531. Park JY., Abdel-Aty M., Meeker E. and Carrol K. (2015) Safety Effects of Roadside Barriers for Different Crash Types and Severities with Crash Information, Proceedings of the Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  532. Wang L. and Abdel-Aty M. (2015) Conflict Precursors for Expressway Weaving Segments Based on Microscopic Simulation, Proceedings of the Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  533. Lee, J., Kuo, P.F., & Abdel-Aty, M. (2015). Comparative Analysis of Hot Zone Identification Methods at the Macroscopic Level. Road Safety & Simulation International Conference, Orlando, Florida, Oct. 6-8, 2015.
  534. Ahmed M, Abdel-Aty M. and Park JY. (2015) Safety Effectiveness of the Conversion of Two-Lane Roadways to Four-Lane Roadways, 5<sup>th</sup> International Symposium on Highway Geometric Design, Vancouver, Canada, June 21-24.
  535. Peng Y, Abdel-Aty M. and Lee J. (2015) Analysis of the Impact of Fog-related Reduced Visibility on Traffic Parameters, accepted for presentation at 94<sup>th</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 15-2271, Washington DC, January 2015.
  536. Abdel-Aty M. and Shi Q. (2014) Viability of Automatic Vehicle Identification Data in Traffic Operation and Safety Analyses, 11<sup>th</sup> International Congress on Advances in Civil Engineering, October 2014, Istanbul, Turkey.
  537. Yu R. and Abdel-Aty M. (2014) Optimal Variable Speed Limit System to Ameliorate Traffic Safety Risk, accepted for presentation at 93<sup>rd</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 14-0539, Washington DC, January 2014.
  538. Wang JH and Abdel-Aty M. (2014) Comparison of Safety Evaluation Approaches for Intersection Signalization in Florida, accepted for presentation at 93<sup>rd</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 14-0374, Washington DC, January 2014.
  539. Yu and Abdel-Aty M. (2014) A Correlated Random Parameter Approach to Investigate the Effects of Weather Conditions on Crash Risk for a Mountainous Freeway, accepted for presentation at 93<sup>rd</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 14-0540, Washington DC, January 2014.

540. Jiang X., Abdel-Aty M. and Alamili S. (2014) Application of Poisson Random Effect Models for Highway Network Screening, accepted for presentation at 93<sup>rd</sup> Annual Meeting of the *Transportation Research Board*, TRB No. 14-0289, Washington DC, January 2014.
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**Currently on AAP website, 4 out of 25 best cited papers**

#### Studies showed that Dr. Aty is:

- Publons, Web-of Science, top 0.1% cited authors globally, 2020.
- Ranked by Microsoft Academic as the world 2<sup>nd</sup> most impactful author in Transport Engineering in 2020  
<https://academic.microsoft.com/topic/22212356/authors?pi=1>
- Top 50 most Cited Civil Engineers in the US and Top 150 worldwide, Elsevier and Shanghai University
- Ranked No. 17 in the field of logistics and transportation out of more than 21,000 researchers. Journal *PLOS Biology*, used a composite indicator based on six citation metrics to rank the scientists from a variety of disciplines and subdisciplines, 2020.
- Top author in Highway Accidents and Accident Prevention, Scopus, last 5 years
- Top author in Traffic Safety, Web of Science, last 5, 10 and 15 years
- UCF/Dr. Aty top university in the US in Safety publications and among top 10 in the world, Study by the University of Southern Australia and Monash University