Program Progress Performance Report for University Transportation Centers

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Project Title:	**Tier I University Transportation Centers** **Center for Accessibility and Safety for an Aging Population (ASAP)**
Program Director:	**John O. Sobanjo, Ph.D., P.E.** **Professor and Director** **Center for Accessibility and Safety for an Aging Population (ASAP)** **Florida State University** **2525 Pottsdamer St., Rm. 129,** **Tallahassee FL 32310** **jsobanjo@fsu.edu / (850) 410.6153**
Submitting Official:	**Same as Program Director**
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1. Accomplishments

1.1 Major Goals and Objectives of the Center

1.1.1 Research

With motivation from Florida's large number of senior residents, the reported relatively high involvement of seniors in traffic crashes nationwide and their special needs for transportation, the theme of the Center is to promote safe and accessible transportation for the aging population. The center focuses on four interdisciplinary areas: Accessibility and community connectivity among older adults; human factors affecting the older population, especially regarding acceptance of emerging technologies; geometric design research, especially regarding elder crash mitigation; and health, wellness and safety of seniors as it relates to multimodal transportation and emergency operations.

1.1.2 Education and outreach

The Center faculty are committed to education and workforce development at all levels, including activities such as the following: Research assistantships; Annual graduate student research colloquia; Seed grants for student pilot projects; Dissertation fellowships; Monthly brown bag lunch and seminar series; Expanding existing NSTI summer program at Florida A&M University (FAMU) and developing NSTI program at Florida State University (FSU), to serve a larger student population over longer time frame; Conducting an annual K-12 Transportation Day; and developing online educational activities and games for inclusion on the Center website.

1.1.3 Collaboration and diversity

The Center is a collaborative effort among Florida State University (FSU), Florida A&M University (FAMU), and the University of North Florida (UNF), with FSU serving as the lead institution. The selection of these two collaborative institutions (FAMU and UNF) is special because of the uniqueness of the two institutions, with FAMU being an HBCU institution. The Center also collaborates with other public section organizations as well as with other Universities. There are both External and Internal Advisory Boards with members appointed from private industry, government agencies, e.g., federal, state, county, city, etc., and academic institutions. Our Center is uniquely equipped to address the challenges of broadening participation and attracting minorities to the transportation field. The Center is committed to increasing the number of students in STEM (science, technology, engineering, and mathematics) fields in general and the transportation field in particular.

1.2 Accomplishment under Major Goals and Objectives

1.2.1 Research

The Center has conducted three cycles of research proposal funding since its inception in late 2013. This report focuses on just the ongoing and recently-completed projects. The Center's research projects have been multi-disciplinary in nature, thus involving principal investigators across colleges and universities in the consortium. With the Center's focus on safety and accessibility as it affects the aging population, each project was assessed in terms of the MAP-21 (Pub. L. 112-141 Sec. 52003) requirements as follows:
- Section 52003 (b) (2) IMPROVING HIGHWAY SAFETY: Outcomes include: Safety assessments and decision-making tools, Innovative operational improvements and designs of roadway and roadside features, Safety measures for vulnerable road users, including bicyclists and pedestrians, and Human factors studies and measures.
- Section 52003 (b) (4) STRENGTHENING TRANSPORTATION PLANNING AND ENVIRONMENTAL DECISIONMAKING: Outcomes include: Creation of models and tools for evaluating transportation measures and transportation system designs, including the costs and benefits; and Transportation and economic development planning in rural areas and small communities.

A sample list of recently awarded, and ongoing or recently-completed funded projects are summarized in the following sections with some details provided on each project. The specific accomplishments in terms of publications, conference presentations, etc. are listed later on in other sections (2.0 Products) of this report.

Funding Cycle 3 Research Projects

ASAP2017-001: A Comprehensive Assessment of Driver Characteristics for Efficient Emergency Evacuation in Areas with an Aging Population (FAMU: Dept. of Civil & Env. Engrg; FSU: Dept. of Civil & Env. Engrg; FSU: Dept. of Psychology; and UNF: School of Engrg), (Project Duration: 1/15/2017 to 7/15/2018).

This study aims to develop a set of statistical models for estimating various driving performance indicators (e.g., travel time, fatigue, lane deviation, break reaction time, crash frequency, minimum space headway) based on a large variety of relevant factors (e.g., traffic flow characteristics, roadway geometric characters, driver characteristics, weather conditions, temporary attributes) under emergency evacuation. A pilot study was conducted to achieve the latter task. A total of 115 participants, involved in the pilot study, were requested to drive a driving simulator, located at the FAMU-FSU College of Engineering (Tallahassee, FL). A number of driving simulation scenarios were developed by varying the roadway geometric characteristics. The pilot study participants were also requested to provide the information regarding their age, gender, occupation, income, marital status, health condition, driving experience under normal conditions and emergency evacuation, and other. Based on the conducted driving simulator experiments the required data were gathered in order to develop a set of statistical models. The candidate statistical models were compared in terms of log-likelihood values. The backward elimination and correlation analyses were conducted for the best fitting model for each response variable in order to identify the factors that affect the considered response variables the most (while statistically insignificant factors were eliminated from the statistical models). The statistical models, developed for the major driving performance indicators that were revealed in the academic literature, are expected to fill out the existing gaps in the state-of-the-art and the state-of-practice related to emergency evacuation of different population groups, especially vulnerable populations such as aging people. Furthermore, findings from this research will facilitate the emergency evacuation process and ultimately will reduce the number of fatalities as a result on natural hazards.

ASAP2017-003: Driver Behavior Recognition and Prediction Models for Improved Highway Safety of Elderly Drivers (FAMU: Dept. of Electrical and Computer Engineering; FSU: Dept. of Electrical and Computer, (Project Duration: 08/01/2017 to 7/31/2018).

In recent years there has been increasing research on incorporating intelligent driver assistance systems (IDAS) into vehicular platforms to help drivers make better driving decisions and to make the roadways safer. Current systems such as lane departure warning, intersection assistance and park assist use models of human behavior to improve reliability and to help decrease driver workload. In this project driver behavior recognition and prediction models for varying demographics including older drivers (65+), young drivers (15-24), and average drivers (25-64) are developed using optimal feature extraction techniques and data fusion methods based on a driver's cognitive and physiological inputs. The driver models are used to design and implement advanced driver assistance technologies that are specific to the needs of each driver for increased roadway safety and enhanced driving experiences. Experimental studies were conducted with various types of drivers using the driving simulator in efforts to build a research platform for further studies on predicting a driver's intent to perform a driving maneuver. The main research objectives during this phase were database generation, optimal feature extraction and driving behavior classification. In database generation, we developed an experimental driving scenario in which subjects had to perform a lane change and/or lane merge while engaging in a secondary task of conversing with co-passengers. The highway scenario attempted to model a 10-mile stretch of Interstate-10 within the local region. Continuing efforts in this area focus on incorporating real-time traffic data into the simulation

to gain deeper insight to driver's behavior within the local region. To obtain optimal feature vectors that accurately capture driving behavior, we first developed an analytical framework for extracting physiological features including eye glance and head turn motion from the data. A glance behavior algorithm was developed that used within frame analysis to characterize how glance frequency was affected by secondary driving tasks. Using glance frequency as a parameter, a lane-change intent algorithm was developed to determine a driver's intent to change lanes. In addition, tangential research investigated the use of low-level acoustic features such as pitch, intensity and frequency formants, to extract the emotional state of the driver. The design of a driver behavior recognition system for differentiated drivers (i.e. young, average, older) is currently being implemented that uses glance frequency, emotional cues and other features, as well as, vehicle dynamics to classify and respond to the behavior and intent of specific drivers. Preliminary results of research on vehicle modeling suggest that feature data can also be used to inform the design of advanced driver assistance systems such as lane departure warning systems under adverse weather conditions. Additionally, we are exploring the use of deep reinforcement learning algorithms for implementing a left turn at non-signal intersections. For fully autonomous vehicles, observable vehicle parameters for left-turn assists are being modeled for integration into the differentiated driver system. The expected outcomes of this work include (1) a driver database of video capture driver profiling data; (2) optimal feature vectors for evaluating driving behaviors; and (3) integrating features into a driver recognition and prediction model that accurately characterizes elderly human driving behavior using vehicle dynamics, behavioral and physiological cues. In addition, this research project helps to support practical research experiences for undergraduate and graduate students, particularly those from underrepresented backgrounds.

ASAP2017-004: Age-Related Postural Abnormalities and its Effect on the Elderly Driving Ability (FAMU: School of Allied Health; FAMU: School of Architecture; and FAMU: Dept. of Mechanical Engrg.), (Project Duration: 8/1/2017 to 7/15/2018).
An important issue facing the ageing population is the need to maintain an independent, active, and mobile quality of life despite declining physical abilities and skills. For the elderly driver, the increasingly dependency on automobile for mobility can place them at a greater risk of death from motor vehicle accident than younger drivers. In the aging adult, structural abnormalities of the spine can have influence on seated driving posture by excessive displacement of the center of mass (COM) that can add increased stress or strain on postural muscles of the neck and back. A change in body proportion or position has been shown to alter alignment at the lumbo-pelvic-hip complex where in the older adult, a maligned or altered postural sitting position may advance existing mobility deficits and create driving challenges that can translate to a rise in accidents among older adults. Postural malalignments can impair successful response time that may cause the body to fail and/or diminish in its ability to react to or adapt to new demands experienced within the immediate environment. Efficient coordinated neuromuscular linkages are necessary for effective transfer of loads and forces up and down the kinetic chain. Thus, a poor driving postural position may considerably elevate risk for neck and low back injury or death during an automobile accident. Safe driving is important for appropriate information processing. It is hereby proposed to carry out a systematic study on the driving ability of elderly drivers in the aging population in Florida. This is done by evaluating the biomechanics of sitting postures and the impact postural impairments may have on the driving ability. Data will be collected from different sitting posture types using 3D motion analysis of pelvic position and COM shifts associated with small and large anteriorly, posteriorly, and lateral force displacement on the sitting posture. Additionally, a postural Harness-Restraint system may be incorporated. A Foot Plate will be used to collect data on foot pressure and load transfer from upper extremity to lower extremity. This is used to evaluate driving response time and sitting posture plus the need for a postural Harness-Restraint system. The results obtained from this study will be used to create a data base and produce models that relate postural impairments impact on driving ability and safety in older adult drivers. Furthermore, it is envisaged that this research will assist in the cabin design of

automobile for elderly drivers. Another component of this project involves an outreach program in the form of health fairs, designed to provide educational workshops that address physical evaluations of static and dynamic posture. This will be presented within the local community at churches and senior social groups.

ASAP2018-001: Development of Efficient Algorithms to Facilitate Emergency Evacuation in Areas with Vulnerable Population Groups (FAMU: Dept. of Civil & Env. Engrg; FSU: Dept. of Civil & Env. Engrg; and FSU: Dept. of Psychology), (Project Duration: 1/01/2018 to 9/30/2018).
This study aims to develop a mathematical model and a set of solution algorithms for assigning evacuees to evacuation routes and emergency shelters, considering major driver characteristics (e.g., age, gender, racial group, driving experience, marital status, health condition, etc.), evacuation route characteristics (number of travel lanes), driving conditions (time of the day, day of the week), and traffic characteristics (space headway, time headway), with the overall objective to minimize the travel time of evacuees. The developed mathematical model and solution algorithms were applied to evacuate the population inhabiting Broward County (Florida), which is often impacted by tropical storms. A needs-based assignment of evacuees to emergency shelter was also considered in this study to account for individuals who require special needs (such as vulnerable population groups) during emergency evacuation. A set of heuristic algorithms (including the Most Urgent Evacuee First heuristic, the Most Urgent Evacuee Last heuristic, the Most Urgent Evacuee Group First heuristic, and the Most Urgent Evacuee Group Last heuristic) and exact optimization algorithm (CPLEX) were applied to solve the emergency evacuation optimization problem. A number of computational experiments were performed, and managerial insights demonstrated the applicability of the proposed methodology for real-life emergency evacuation scenarios. The proposed mathematical model and optimization algorithms may be used as an efficient practical tool by State and local authorities in improving the utilization of emergency evacuation routes and emergency shelters, reducing or eliminating traffic congestion on roadways during emergency evacuation, and reducing the travel time of evacuees during emergency evacuation. Moreover, the developed decision support tools are expected to improve the overall effectiveness of emergency evacuation process, and ensure safety of evacuees, including vulnerable population groups.

1.2.2 Education and outreach

❖ **FSU's Women in Math, Science, and Engineering (WIMSE):** On October 24, 2017, the Center hosted a laboratory visit by members of the Women in Math, Science, and Engineering (WIMSE). Based at the Florida State University (FSU), WIMSE is a living-learning community (LLC) on campus that supports the growth and development of women in STEM fields. Under the leadership of Dr. John Sobanjo (ASAP Director), and supervision of Richard Twumasi-Boakye, Ryan Doczy, and Sneha Chityala, all graduate students and research assistants at Florida State University, the group of the six visiting WIMSE students was introduced to the Driving Simulator Laboratory at the FAMU-FSU College of Engineering.

The laboratory visit which lasted for an hour was divided into three (3) sessions. The first session comprised a brief overview of the fundamental research emphases of the UTC, and applications of the ultra-modern *DriveSafety* Driving Simulator. The second session was designed with a primary goal of creating a sense of cognizance of the area of transportation engineering, including a clear understanding of essential concepts related to driver decisions such as speed, permitted left-turn movement, and gap acceptance. This was achieved through a short exercise developed in which the students had to decide when driving, whether or not to make a permitted left-turn movement based on the available headways (gaps) between oncoming vehicles. The final session included a review of on-going research projects that involved the use of the Driving Simulator. Afterwards, the students took turns in operating the Driving Simulator. In summary, this event was very successful, with most of the WIMSE students expressing interests in the laboratory's research activities. They further mentioned how much knowledge they had gained with respect to aging-focused research and were also impressed with the Driving Simulator's research applications and capabilities.

❖ ***ASAP Researchers Win Best Paper Award at the 2018 BHAA Conference in Chicago:*** ASAP Graduate Research Assistants and Florida A&M University (FAMU) students won the Best Paper Award in the Physical Therapy Track during the 54th Annual Business Health Administration and Association (BHAA) Conference, in conjunction with the Midwest Business Administration and Association (MBAA) Conference, held in Chicago, Illinois, April 18-21, 2018. The research team was guided by FAMU Professors Drs. Peter N. Kalu and Kischa S. Reed and included Kenny Liu, a doctoral graduate student from the School of Allied Health Sciences Division of Physical Therapy and Aruoture Egoh from the FAMU-FSU College of Engineering. Kenny Liu is a third year student in the Doctor of Physical Therapy program, and Aruoture Egoh is a Ph.D. candidate in the Department of Mechanical Engineering. The students presented investigations on a research entitled, "Age-Related Physical Impairments and Driving Ability in Older Drivers." The research was sponsored by the Center for Accessibility and Safety for an Aging Population (ASAP), and it focused on factors that influence the anatomy of sitting and driving ability in aging populations.

❖ **ASAP Center holds Fourth Annual Transportation Day:** In spite of inclement weather on December 8, 2017, attendance at the Fourth Annual Transportation Day included more than 80 faculty and students from the affiliated universities, along with community members and representatives from state and local agencies who work with transportation and/or aging populations. Held at the FAMU-FSU College of Engineering, this year's theme was Mobility and Technology for the Ages. Murry Gibson, Dean of the College of Engineering kicked off the event by welcoming everyone in attendance. Ross Ellington, Associate Vice-President for Research at FSU, and Rodner Wright, Interim Provost and Vice-President for Academic Affairs at FAMU, also welcomed our guests. John Sobanjo, Center Director and Professor of Civil Engineering, briefly discussed the University Transportation Center's (UTC) mission and research activities. Dr. Neil Charness presented awards to two of ASAP's outstanding graduate students. Jaqueline Masaki, PhD student in Civil Engineering, was recognized for research excellence, including a first place finish in the student poster competition at the 5th Annual Southeastern Region UTC Conference. Dustin Souders, PhD student in Psychology, was named the 2017 UTC Student of the Year.

The rest of the day's activities were divided into two tracks. One focused on Aging and Mobility for seniors. In this track, senior adults and researchers took part in a panel discussion led by community experts, including:

- Anne Barrett, Director of the FSU Pepper Institute,
- Gail Holley, Manager of FDOT's Safe Mobility for Life Coalition,
- Hella Spellman, Program Supervisor of Tallahassee Senior Services, and
- Mark Horner, Professor of Geography at FSU.

In addition, a research seminar featured presentations by ASAP faculty affiliates, including Drs. Maxim Dulebenets and Eren Ozguven of the FAMU-FSU College of Engineering, and Dr. Thobias Sando of the University of North Florida. Kakit Fung, a PhD student at FAMU-FSU, presented results of research he completed under the direction of Dr. Sungmoon Jung.

The second track concentrated on Teens and Transportation. Thirty five students and chaperones

from the FAMU Developmental Research School enjoyed presentations and hands-on engineering activities. Joseph Sullivan of the Federal Highway Association discussed career opportunities in the transportation field. Lisa Spainhour, Professor and Interim Chair of the Dept. of Civil & Environmental Engineering and Doreen Kobelo, Professor and Program Area Coordinator of Construction Engineering at FAMU, led hands-on STEM exercises, including a spaghetti and marshmallow bridge building activity.

A highlight of the day was a sobering presentation on teen driving safety and distracted driving, led by Joseph Santos FDOT Safety Office and Demitrius Branca, who has spent the last three years

talking to high school students and fighting for tougher laws since his son, Anthony, was killed by a distracted driver in 2014. Dr. Lisa Bacot, Executive Director, Florida Public Transportation Association served as our Keynote Speaker. She delivered a lecture titled "Older Adults and Transit: A Safe Alternative to Driving." Dr. Bacot described the benefits of public transportation, including how it helps build a strong economy, cuts air pollution and carbon emissions, relieves traffic congestion, provides critical support during emergencies, is safer than car travel, and provides access for people of all ages. Bacot emphasized that directing resources to support a robust transit system is a priority especially given the increasing number of older adults who currently have poor transit access.

Between sessions, attendees had an opportunity to visit with booth representatives from AAA, StarMetro, Federal Highway Administration, Safe Mobility for Life Coalition, *CarFit*, FSU's Institute for Successful Longevity and the FDOT Internship Program. More than 20 posters showcasing recent ASAP research were also available for viewing. Unfortunately, due to weather, the outside *CarFit* activities had to be cancelled. The day ended with Driving

Simulator Demonstrations at the ASAP Laboratory.

❖ **Undergraduate Research Opportunity Program (UROP):** Maiya Hinton, a sophomore in the College of Business, joined Dr. Shonda Bernadin's lab as part of the Undergraduate Research Opportunity Program (UROP) during Fall 2017 and Spring 2018 semesters. She conducted research on driver scenario and map design of a 10-mile stretch on Interstate-10 with an emphasis on driver responses to four different lane shift scenarios. Her research is instrumental for data collection experiments with elderly drivers.

❖ **Research Experiences for ECE Undergraduates (REEU):** Rollin Scott, a senior in the Electrical and Computer Engineering Department, joined Dr. Shonda Bernadin's lab as part of an undergraduate research experience during Fall 2017 and Spring 2018. She conducted research on effective in-vehicle conversational dialog systems with a focus on voice interfacing for aging drivers.

❖ **ITE Collegiate Traffic Bowl:** Each year the Institute of Transportation Engineers (ITE) Student Chapters from Canada and United States usually participate in the Collegiate Traffic Bowl where the participating Student Chapters are represented by teams comprising of three students. On April 2, 2018, after a mock traffic bowl contest, Oluwanifemi Adegbulugbe, Olumide Abioye, and Jaqueline Masaki, all graduate students at the FAMU-FSU College of Engineering and Graduate Research Assistants at ASAP, were selected to represent the ITE FAMU-FSU Student Chapter.   The faculty members and judges at the mock contest include the College Dean, Dr. Murray Gibson, and faculty members and ASAP Researchers Dr. John Sobanjo, Dr. Ren Moses, and Dr. Eren Ozguven, as well as Ms. Holly Munroe Cohen (President, Big Bend Florida Chapter ITE), and Dr. Raj Ponnaluri (PhD, P.E, PTOE, PMP Connected Vehicles and Arterial Management Engineer, FDOT).

1.2.3 Collaboration and diversity

There were collaborations with public agencies: Florida Department of Transportation (FDOT)'s Research Office; FDOT's Safe Mobility for Life Program; and FSU's Claude Pepper Institute for Aging. Internal and external advisory boards have also been established with memberships from the private industry, government agencies, e.g., federal, state, county, city, etc., and academic institutions.

Internal Advisory Board

Name	Title/Employer	Industry	Expertise
Bruce Harvey	Assoc. Prof., FAMU-FSU College of Engineering	Academic	Electrical & Computer Engineering
Michelle Rambo-Roddenberry	Assoc. Prof., FAMU-FSU College of Engineering	Academic	Civil & Environmental Engineering
John Sobanjo	Prof., FAMU-FSU College of Engineering	Academic	Civil & Environmental Engineering
Neil Charness	Prof., FSU Dept. of Psychology	Academic	Psychology
Mark Horner	Prof., FSU Dept. of Geography	Academic	Geography

External Advisory Board

Name	Title/Employer	Industry	Expertise
Karlene Ball	Prof. & Chair, Dept. of Psychology, Univ. of Alabama, Birmingham	Academic	Aging and Driving
Lynn Barr	Mobility Coordinator, Capital Region Transportation Planning Agency	MPO	Transportation Planning
Sara Czaja	Prof. Dept. of Psychiatry, Behavioral Sciences, and Industrial Engineering, Univ. of Miami, Florida	Academic	Aging
Heejo Ham	Senior Transportation Modeler *Stantec*	Industry	Transportation Planning
Gail M. Holley	Safe Mobility for Life Program and Research Manager, FDOT	State	Transportation Safety
Bill Horrey	The Liberty Mutual Research Institute, Boston, MA	Industry	Transportation Safety/Human Factors
Sylvester A. Kalevela	Acting Dean/Prof., Transportation Engineering, Colorado State Univ.	Academic	Transportation
Ivan Maldonado	Director of Transportation, Hillsborough Area Regional Transit Authority	MPO	Transportation
Trenda McPherson	FDOT Pedestrian Safety	State	Transportation Safety
Eric Sawyer	Retired City Traffic Engineer, Tallahassee	City	Transportation Traffic

2. Products

Publications, conference papers, and presentations

The following list shows for the reporting period, the publications, conference papers, presentations, etc., resulting from the research funding at the Center.

The following papers have been published or in press for journal publication:

[1] Alisan, O., Tuydes-Yaman, H., Kocatepe, A., and Ozguven, E. E. (2018). "Developing Performance Measures to Evaluate Impact of Cross-county Collaboration for Populations with Access and Functional Needs", International Journal of Disaster Risk Reduction, Volume 31, pp. 873-885, https://doi.org/10.1016/j.ijdrr.2018.08.007

[2] Alisan, O., Kocatepe, A., Tuydes-Yaman, H., Ozguven, E. E., & Ozel, H. (in press). Benefits of Managing Special Needs Shelters (SpNS) Capacities with Utilizing Cross-County Collaboration: A Case Study Application in Florida. *Transportation Research Record*, 19 pages.

[3] Bond, M., Brown, J. R., & Wood, J. (in press). Adapting to Challenge: An Examination of Older Adult Transportation in Rural and Small Communities. *Case Studies on Transport Policy*, 17 pages.

[4] Cordova, J., Sriram, K. L., Kocatepe, A., Zhou, Y., Ozguven, E. E., and Arghandeh, R., "Combined Electricity and Traffic Short-Term Load Forecasting Using Bundled Casuality Engine", Accepted for Publication at the IEEE Transactions on Intelligent Transportation Systems, 2018.

[5] Douglas, R., Kocatepe, A., Barrett, A., Ozguven, E. E., and Gumber, C., (in press). "Evacuating People and Their Pets: Older Floridians' Need for and Proximity to Pet-Friendly Shelters", *Journal of Gerontology: Social Sciences*, 2017.

[6] Dulebenets, M.A., Moses, R., Ozguven, E., & Vanli, A., (2017). Minimizing Carbon Dioxide Emissions due to Container Handling at Marine Container Terminals via Hybrid Evolutionary Algorithms. *IEEE Access*, IEEE, pp. 1-17. DOI: 10.1109/ACCESS.2017.2693030.

[7] Dulebenets, M.A., (2017). The Green Vessel Scheduling Problem with Transit Time Requirements in a Liner Shipping Route with Emission Control Areas. *Alexandria Engineering Journal*, Elsevier, pp. 1-12. DOI: 10.1016/j.aej.2016.11.008.

[8] Dulebenets, M.A., & Ozguven E.E., (2017). Vessel Scheduling in Liner Shipping: Modeling Transport of Perishable Assets. *International Journal of Production Economics*, Elsevier, Vol. 184, pp. 141-156. DOI: 10.1016/j.ijpe.2016.11.011.

[9] Dulebenets, M.A., (2018). Evaluation of Non-Parametric Selection Mechanisms in Evolutionary Computation: A Case Study for the Machine Scheduling Problem. In *Nature-inspired Methods for Stochastic, Robust and Dynamic Optimization* (Editors: Del Ser Lorente, J.; Osaba, E.; ISBN: 978-1-78923-329-2), IntechOpen, United Kingdom, pp. 23-45. DOI: 10.5772/intechopen.75984.

[10] Dulebenets, M.A., Abioye, O.F., Ozguven, E.E., Moses, R., Boot, W.R., & Sando, T. (2019). Development of Statistical Models for Improving Efficiency of Emergency Evacuation in Areas with Vulnerable Population. *Reliability Engineering & System Safety*, Elsevier, pp. 1-17. DOI: 10.1016/j.ress.2018.09.021 – in press.

[11] Dulebenets, M.A., (2018). A Comprehensive Evaluation of Weak and Strong Mutation Mechanisms in Evolutionary Algorithms for Truck Scheduling at Cross-Docking Terminals. *IEEE Access*, IEEE, pp. 1-16. DOI: 10.1109/ACCESS.2018.2874439 – in press.

[12] Dulebenets, M.A., (2018). Minimizing the Total Liner Shipping Route Service Costs via Application of an Efficient Collaborative Agreement. *IEEE Transactions on Intelligent Transportation Systems*, IEEE, pp. 1-14. DOI: 10.1109/TITS.2018.2801823 – in press.

[13] Dulebenets, M.A., Kavoosi, M., Abioye, O.F., & Pasha, J., (2018). A Self-Adaptive Evolutionary Algorithm for the Berth Scheduling Problem: Towards Efficient Parameter Control. *Algorithms*, MDPI, Vol. 11 (7), pp. 1-35. DOI: 10.3390/a11070100.

[14] Dulebenets, M.A., (2018). A Diploid Evolutionary Algorithm for Sustainable Truck Scheduling at a Cross-Docking Facility. *Sustainability*, MDPI, Vol. 10 (5), pp. 1-23. DOI: 10.3390/su10051333.

[15] Dulebenets, M.A., (2018). The Green Vessel Scheduling Problem with Transit Time Requirements in a Liner Shipping Route with Emission Control Areas. *Alexandria Engineering Journal*, Elsevier, Vol. 57 (1), pp. 331-342. DOI: 10.1016/j.aej.2016.11.008.

[16] Dulebenets, M.A., Ozguven, E.E., & Moses, R., (2018). The Highway Beautification Act: Towards Improving Efficiency of the Federal Outdoor Advertising Control Program. *Transportation Research Part A: Policy and Practice*, Elsevier, Vol. 110, pp. 88-106. DOI: 10.1016/j.tra.2018.01.031.

[17] Dulebenets, M.A., (2018). Green Vessel Scheduling in Liner Shipping: Modeling Carbon Dioxide Emission Costs in Sea and at Ports of Call. *International Journal of Transportation Science and Technology*, Elsevier, Vol. 7 (1), pp. 26-44. DOI: 10.1016/j.ijtst.2017.09.003.

[18] Dulebenets, M.A., (2018). The Vessel Scheduling Problem in a Liner Shipping Route with Heterogeneous Vessel Fleet. *International Journal of Civil Engineering*, Springer, Vol. 16 (1), pp. 19-32. DOI: 10.1007/s40999-016-0060-z.

[19] Dulebenets, M.A., Golias, M.M., & Mishra, S., (2018). A Collaborative Agreement for Berth Allocation under Excessive Demand. *Engineering Applications of Artificial Intelligence*, Elsevier, Vol. 69, pp. 76-92. DOI: 10.1016/j.engappai.2017.11.009.

[20] Dulebenets, M.A., (2018). A Comprehensive Multi-Objective Optimization Model for the Vessel Scheduling Problem in Liner Shipping. *International Journal of Production Economics*, Elsevier, Vol. 196, pp. 293-318. DOI: 10.1016/j.ijpe.2017.10.027.

[21] Dulebenets, M.A., (2018). Application of the Evolutionary Computation for Berth Scheduling at Marine Container Terminals: Parameter Tuning versus Parameter Control. *IEEE Transactions on Intelligent Transportation Systems*, IEEE, Vol. 19 (1), pp. 25-37. DOI: 10.1109/TITS.2017.2688132.

[22] Dulebenets, M.A., (2017). A Novel Memetic Algorithm with a Deterministic Parameter Control for Efficient Berth Scheduling at Marine Container Terminals. *Maritime Business Review*, Emerald, Vol. 2 (4), pp. 302-330. DOI: 10.1108/MABR-04-2017-0012.

[23] Dulebenets, M.A., Golias, M., & Mishra, S., (2017). The Green Vessel Schedule Design Problem: Consideration of Emissions Constraints. *Energy Systems*, Springer, Vol. 8 (4), pp. 761-783. DOI: 10.1007/s12667-015-0183-3.

[24] Dadashi, A., Dulebenets, M.A., Golias, M.M., & Sheikholeslami, A., (2017). A Novel Continuous Berth Scheduling Model at Multiple Marine Container Terminals with Tidal Considerations. *Maritime Business Review*, Emerald, Vol. 2 (2), pp. 142-157. DOI: 10.1108/MABR-02-2017-0010.

[25] Fung, K., Jung, S. & Sobanjo, J. (Accepted for publication). Main Effects of Driving Postures Changes in Frontal Collisions Due to Aging. *International Journal of Vehicle Safety*.

[26] Fung, K., Xu, R., Jung, S. & Sobanjo, J. (2018). Development and Testing of a Simplified Dummy for Frontal Crash. *Experimental Techniques*, Springer International Publishing, pp 1-8. https://doi.org/10.1007/s40799-018-0261-2

[27] Gilanifar, M., Wang, H., Ozguven, E. E., Zhou, Y., and Arghandeh, R., "Bayesian Spatiotemporal Gaussian Process for Short-term Load Forecasting Using Combined Transportation and Electricity Data", Accepted for Publication in the ACM Transactions on Cyber-Physical Systems, 2018.

[28] Horner, M. W., Ozguven, E. E., Marcelin, J. M., and Kocatepe, A. (Accepted for publication). Placing Special Needs Hurricane Shelters and the Aging Population: Development of a Methodology and a Case-study Application. *Disasters*.

[29] Kidando, E., Moses, R., Ozguven, E. E., & Sando, T. (in press). Evaluating Traffic Congestion Using the Traffic Occupancy and Speed Distribution Relationship: An Application of Bayesian Dirichlet Process Mixtures of Generalized Linear Model. *Journal of Transportation Technologies*, 16 pages.

[30] Kidando, E., Moses, R., Abdelrazig, Y., & Ozguven, E. E. (in press). Safety Analysis Considering the Impact of Travel Time Reliability on Elderly Drivers. *Journal of the Transportation Research Forum*, 19 pages.

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[32] Kidando, E., Moses, R., Sando, T., and Ozguven, E. E. (2018). "Incorporating Travel Time Reliability in Predicting the Likelihood of Severe Crashes on Arterial Highways Using Non-parametric Random-Effect Regression", Accepted for Publication at the Journal of Traffic and Transportation Engineering.

[33] Kidando, E., Moses, R., Sando, T., and Ozguven, E. E., "Evaluating Recurring Traffic Congestion Using Change Point Regression and Random Variation Markov Structured Model", Accepted for Publication at the Transportation Research Record, 2018, https://doi.org/10.1177/0361198118787987.

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[36] Kitali, A. and Sando, T., Castro, A, Kobelo, D., and Mwakalonge, J. (in press). Appraisal of Safety Effects of Pedestrian Countdown Signals to Drivers Using Crash Modification Factors. *ASCE Journal of Transportation Engineering.*

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[43] Njobelo, G. L., Sando, T., Sajjadi, S., Mtoi, E. T., Sobanjo, J., and Ozguven, E. E. (2018). "Safety Evaluation of the Advanced Stop Assist System in a Connected Vehicle Environment", Accepted for Publication at the Transportation Research Record. http://journals.sagepub.com/doi/full/10.1177/0361198118797831.

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[51] Ulak, M. B., Kocatepe, A., Sriram, L. M. K., Ozguven, E. E., and Arghandeh, R., (2018). "Assessment of the Hurricane-Induced Power Outages from a Demographic, Socioeconomic and

Transportation Perspective", Natural Hazards, Volume 92, Issue 3, pp. 1489-1508, https://doi.org/10.1007/s11069-018-3260-9.

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The following papers have been submitted and are under review for journal publication:

[1] Alisan, O., Tuydes-Yaman, H., Kocatepe, A., Ozguven, E. E., Performance and Cost of Cross-County Collaboration in Special Needs Shelter (SpNS) Planning, (under review in *Transportation Research Record*).

[2] Abdelrazig, Y., Doczy, R., Mafi, S., & Ozguven, E. E. (submitted). Contextual and human factors simulation approach to analyze older drivers' behavior at intersections executing right and left turn maneuvers. Journal of Safety Research. Manuscript submitted for publication, 18 pages.

[3] Abdelrazig, Y., Doczy, R., Boot, W., Ozguven, E. E., & Moses, R., Elderly Drivers Left-turn Crash Risk Analysis using 3-D Visualization and Human Factors Simulation (under review in *Traffic Injury Prevention*).

[4] Bond, M., Brown, J. R., & Wood, J. (submitted). Adapting to Challenge: An Examination of Older Adult Transportation in Rural and Small Communities. *Case Studies in Transport Policy*. Manuscript submitted for publication, 17 pages.

[5] Cordova, J., Kocatepe, A., Zhou, Y., Ozguven, E. E., and Arghandeh, R. Casual Analysis of Traffic Load Flow and Electricity Consumption Dependencies in Urban Areas, (under review in *Transportation Research Record*).

[6] Cordova, J., Sriram, L. M. K., Kocatepe, A., Zhou, Y., Ozguven, E. E., and Arghandeh, R. Combined Electricity and Traffic Load Forecasting Using Causality Analysis, (under review in *IEEE on Intelligent Transportation Systems*).

[7] Douglas, R., Kocatepe, A., Barrett, A., Ozguven, E. E., & Gumber, C. Pet Evacuation Preparedness: An Examination of Older Adults' Needs for and Proximity to Pet-friendly Shelters in Florida, (under review in *Journal of Gerontology*).

[8] Dulebenets, M.A., Rahimi, A., & Mazaheri, A. Assessing the Effects of Indirect Left Turn on a Signalized Intersection Performance: A Case Study for the Tehran Metropolitan Area. *International Journal of Civil Engineering*, Springer.

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[10] Dulebenets, M.A. A Green Vessel Scheduling in Liner Shipping: Minimizing Carbon Dioxide Emission Costs. *International Journal of Transportation Science and Technology*, Elsevier.

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[13] Dulebenets, M.A. Archived Elitism in Evolutionary Computation: Towards Improving Solution Quality and Population Diversity.

[14] Dulebenets, M.A. An Adaptive Island Evolutionary Algorithm for the Berth Scheduling Problem.

[15] Rahimi, A.M., Dulebenets, M.A., & Mazaheri, A. A Comprehensive Comparative Analysis of the AIMSUN and SimTraffic Microsimulation Models for the Urban Networks with Different Functional Classifications.

[16] Gilanifar, M., Cordova, J., Wang, H., Ozguven, E. E., and Arghandeh, R., "Advanced Traffic Load Forecasting using the Bayesian Spatio-temporal Data Fusion", (under review in *Transportation Research Record*).

[17] Gilanifar, M., Cordova, J., Wang, H., Ozguven, E. E., Zhou, Y., & Arghandeh, R. (submitted). Multi-Task Bayesian Spatiotemporal Gaussian Processes for Short-term Load Forecasting. IEEE Transactions on Smart Grid. Manuscript submitted for publication, 8 pages.

[18] Haule, H., Sando, T., Kitali, A., and Richardson, R. Investigating Proximity of Crash Locations to Aging Pedestrian Residences. (under review in *Journal of Transportation Research Record*).

[19] Haule, H., Sando, T., Kitali, A., Angel, M., and Ozguven, E. Influence of Intersection Characteristics on Elderly Driver Crash Involvement. (under review in *Journal of Transportation Research Record*).

[20] Hou, J., Ozguven, E. E., & Arghandeh, R. (submitted). The Road toward Smart Cities: A Focus Group Study on Citizens' Perceptions and Use of Mobile Applications for City Management. Computers in Human Behavior. Manuscript submitted for publication, 16 pages.

[21] Kidando, E., Moses, R., Sando, T., and Ozguven, E. E. (submitted). Disparity-Effects Associated with Lateral Lane Locations and Days of the Week Influence on the Dynamic Transition of Traffic Conditions, Transportation Research Record, Manuscript submitted for publication, 18 pages.

[22] Kitali, A., Kidando, E., Sando, T., Moses, R., Ozguven, E. Predicting the Likelihood of Aging Pedestrian Severe Crashes Using Dirichlet Random-Effect Bayesian Logistic Regression Model. (under review in *Journal of Transportation Research Records*).

[23] Kocatepe, A., Ulak, M. B., Ozguven, E. E., Horner, M., & Arghandeh, R., Socioeconomic Characteristics and Crash Proneness: A Case Study in Florida Using Two-step Floating Catchment Area Method, (under review in *Applied Geography*).

[24] Kocatepe, A., Ulak, M. B., Ozguven, E. E., Horner, M., Exposure of the Population to Severity-Weighted Crash Hotspots: An Integrated GIS and Random Parameter Model Approach, (under review in *Transportmetrica A*).

[25] Kocatepe, A., Ulak, M. B., Kakareko, G., Pinzan, D., Cordova, J., Ozguven, E. E., Jung, S., Arghandeh, R., and Sobanjo, J., "Assessment of Emergency Facility Accessibility in the Presence of Hurricane-related Roadway Closures and Prediction of Future Roadway Disruptions", (under Review in *Transportation Research Record*).

[26] Kocatepe, A., Ozguven. E. E., Horner, M., Ozel, H., Pet- and Special Needs-Friendly Shelter Planning in South Florida: A Spatial Capacitated p-Median-based Approach, (under review in *International Journal of Disaster Reduction*).

[27] Kocatepe, A., Ulak, M. B, Lores, J., Ozguven, E. E., Yazici, A., "Assessing the Factors that Affect the Public Engagement with Department of Transportation Twitter Accounts", (under review in *Transportation Research Record*).

[28] Lwambagaza, L., Sando, T., and Ozguven, E. Older Drivers' Behavior at On-Ramp Merging Areas (under review in *Journal of Transportation Research Record*).

[29] Njobelo, G., Sando, T., Sajjadi, S., Mtoi, E., Dulebenets, M., and Sobanjo, J. Enhancing the Green Light Optimized Speed Advisory System to Incorporate Queue Formation (under review in *Journal of Transportation Research Record*).

[30] Njobelo, G., Kitali, A., Machumu, K., and Sando, T. Calibration of VISSIM Discharge Headways Based on Field Measured Values and Naturalistic Driving Study Data (under review in *Journal of Transportation Research Record*).

[31] Sriram, L. M. K., Ulak, M. B., Ozguven, E. E., and Arghandeh, R. (submitted). Causality-based Combined Power and Transportation Resilience (Co-Resilience) during Hurricanes, Transportation Research Record, Manuscript submitted for publication, 16 pages.

[32] Ulak, M. B., Ozguven, E. E., & Spainhour, L. Spatial Investigation of Crashes Involving Aging Drivers: A GIS-based Case Study in the Northwest Florida (under review in *Journal of Transport Geography*).

[33] Ulak, M. B., Ozguven, E. E., Moses, R., Sando, T., Boot, W., Abdelrazig, Y., & Sobanjo, J., Risk Propensity-Focused Assessment of Traffic Performance Measures and Safety: A Micro-simulation Based Analysis for an Unsignalized T-intersection (under review in *Transportmetrica B*).

[34] Ulak, M. B., Kocatepe, A., Sriram, L. M. K., Ozguven, E. E., and Arghandeh, R., Assessing the Hurricane-induced Power Outages from a Demographical, Socioeconomic and Transportation Perspective. (under review in *Transportation Research Record*).

[35] Ulak, M. B., Ozguven, E. E., Vanli, O., Dulebenets, M., Spainhour, L. Multimodal Investigation of Crashes Involving Aging Drivers, Passengers, Bicyclists and Pedestrians. (under review in *Transportation Research Record*).

[36] Ulak, M. B., Kocatepe, A., Ozguven, E. E., Horner, M. An Investigation of Crash Proximity to Residential Locations of Crash Occupants. (under review in *Transportation Research Record*).

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[38] Wood, B., Horner, M., Duncan, M. & Valdez-Torres, Y. Do Transit Oriented Development Provide Greater Local Neighborhood Access to Activities for Older Adults? (under review in *Journal of Transport and Land Use*).

[39] Wood, B., Horner, M., Duncan, M. & Valdez-Torres, Y. Assessing Transit Oriented Development for Older Adults: Geographical, Modal, and Built Environmental Factors (under review in *Transport Policy*).

[40] Wood, J., Brown, J., & Marques, M. Older Adults and Transportation Preferences: Results from a Community Survey and Interviews. (under review in *Transportation Research Record*). 19 pages.

The following papers are scheduled or already presented at conferences, meetings, workshops, etc.:

[1] Alisan, O., Tuydes-Yaman, H., Kocatepe, A., and Ozguven, E. (2018). Performance and Cost of Cross-County Collaboration in Special Needs Shelter (SpNS) Planning. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[2] Bernadin, S., Ehtemami, A., Bhattacharya, S., & Scott, R. (2018). Assessing Driver Performance of Lane-Merge Tasks Using Video Capture Method. IEEE *SoutheastCon*.

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[3] Bhattacharya, S., & Bernadin, S. (2018l). Virtual Lateral Vehicle Variation Study. IEEE *SoutheastCon*.

[4] Deng, O., Mullings, A., Kovankaya, Y., Byrd, M., Ulak, M., Kocatepe, A., and Ozguven, E. E. (2018). "Geographic Information System-based Impact Analysis of Hurricane Hermine: Case Study in Tallahassee, Florida", Presented at the Transportation Research Board's 97th Annual Meeting, Washington DC, USA, January 7-11, 2018.

[5] Dulebenets, M.A., Abioye, O.F., Pasha, J., & Kavoosi, M. (2019). Polyploid Evolutionary Algorithms for Truck Scheduling at Cross-Docking Facilities. Transportation Research Board, 98th Annual Meeting. Washington, DC, January 13-19, 2019 – scheduled for poster session.

[6] Dulebenets, M.A., Kavoosi, M., Abioye, O.F., & Pasha, J. (2018). Strong and Weak Mutation Mechanisms in Evolutionary Algorithms: A Case Study for the Truck Scheduling Problem at a Cross-docking Facility. Transportation Research Board, 98th Annual Meeting. Washington, DC, January 13-19, 2019 – scheduled for poster session.

[7] Dulebenets, M.A., Abioye, O.F., Pasha, J., Kavoosi, M., Ozguven, E.E., Moses, R., Boot, W.R., & Sando, T. (2018). Development of Solution Algorithms for Efficient Emergency Evacuation Planning. Transportation Research Board, 98th Annual Meeting. Washington, DC, January 13-19, 2019 – scheduled for poster session.

[8] Dulebenets, M.A., Abioye, O.F., Kavoosi, M., Pasha, J., Ozguven, E.E., Moses, R., & Boot, W.R. (2018). A Novel Multi-Objective Approach for Emergency Evacuation Planning. FAMU Inaugural Research Symposium, Tallahassee, FL, November 8, 2018 - poster session.

[9] Dulebenets, M.A., Abioye, O.F., Moses, R., Ozguven, E.E., Vanli, A., & Sando, T. (2018). Berth Scheduling at Marine Container Terminals: Minimizing Carbon Dioxide Emissions due to Container Handling. INFORMS Annual Meeting 2018. Phoenix, AZ, November 4-7, 2018 - lectern session.

[10] Dulebenets, M.A., Ozguven, E.E., Moses, R., Sando, T., & Ulak, M.B. (2018). Intermodal Freight Network Design Problem: Consideration of the Product Perishability. INFORMS Annual Meeting 2018. Phoenix, AZ, November 4-7, 2018 - lectern session.

[11] Dulebenets, M.A., Abioye, O.F., Ozguven, E.E., Moses, R., Boot, W.R., & Sando, T. (2018). Emergency Evacuation Planning Optimization in the Areas with Vulnerable Populations. INFORMS Annual Meeting 2018. Phoenix, AZ, November 4-7, 2018 - lectern session.

[12] Dulebenets, M.A., Rahimi, A.M., Mazaheri, A., Pasha, J., & Kavoosi, M. (2018). The Access Management Application for Improving Performance of a Signalized Intersection. INFORMS Annual Meeting 2018. Phoenix, AZ, November 4-7, 2018 - lectern session.

[13] Dulebenets, M.A., Kavoosi, M., Pasha, J., & Abioye, O.F. (2018). Improving Berth Schedule Efficiency via Evolutionary Algorithms with Efficient Parameter Control. INFORMS Annual Meeting 2018. Phoenix, AZ, November 4-7, 2018 - lectern session.

[14] Abioye, O.F. & Dulebenets, M.A. (2018). A Driving Simulator Study for Improving Efficiency of Emergency Evacuation in Areas with a Significant Presence of Aging Adults. FAMU Graduate Student Appreciation Week, Tallahassee, FL, April 2-6, 2018 - poster session.

[15] Dulebenets, M. (2018). Lightning Talk: Application of Parallel Evolutionary Algorithms for Improving Efficiency of the Seaside Operations at Marine Container Terminals. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[16] Dulebenets, M. (2018). Vessel Scheduling in Liner Shipping: A Multiobjective Optimization Model for a Comprehensive Analysis of the Conflicting Objectives, Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[17] Ehtemami, A., Scott, R., & Bernadin, S. (2018l). A Survey of FMRI Data Analysis Methods. IEEE *SoutheastCon*.

[18] Haule, H., Sando, T., Kitali, A., Angel, M., and Ozguven, E. (2018). Influence of Intersection Characteristics on Elderly Drivers Crash Involvement. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[19]Hou, J., Tang, T., Catherine, A., Wu, Y., Arghandeh, R., and Ozguven, E. E., "The Road toward Smart Cities: A Focus Group Study on Citizens' Perceptions and Use of Mobile Application for City Management", Accepted for Presentation at the 104th NCA Annual Convention, National Communication Association, Salt Lake City, UT, USA, November 8-11, 2018.

[20]Kidando, E., Moses, R., Sando, T., and Ozguven, E. E. (2018). "Evaluating Recurring Traffic Congestion Using Change Point Regression and Random Variation Markov Structured Model", Presented at the Transportation Research Board's 97th Annual Meeting, Washington DC, USA, January 7-11.

[21]Kidando, E., Moses, R., Sando, T., and Ozguven, E. E. (2018). "Probabilistic Inference and Prediction of Travel Time Reliability: Empirical Analysis of Associated Factors", Presented at the Transportation Research Board's 97th Annual Meeting, Washington DC, USA, January 7-11, 2018.

[22]Kidando, E., Moses, R., Sando, T., and Ozguven, E. (2018). Probabilistic Inference and Prediction of Travel Time Reliability: Empirical Analysis of Associated Factors. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[23]Kidando, E., Ghorbanzadeh, M., Moses, R., and Ozguven, E. E., "Traffic Operation and Safety Analysis on an Arterial Highway: Implications for Connected Vehicle Applications", Accepted for Presentation at the IEEE Conference on Intelligent Transportation Systems, Hawaii, USA, November 4-7, 2018.

[24]Kitali, A., Kidando, E., Sando, T., Moses, R., and Ozguven, E. (2018). Predicting the Likelihood of Aging Pedestrian Severe Crashes Using Dirichlet Random-Effect Bayesian Logistic Regression Model. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[25]Kocatepe, A., Ulak, M., Kakareko, G., Pinzan, D., Cordova, J., Ozguven, E., Jung, S., Arghandeh, R., Sobanjo, J. (2018). Assessment of Emergency Facility Accessibility in the Presence of Hurricane-Related Roadway Closures and Prediction of Future Roadway Disruptions. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[26]Kocatepe, A., Ulak, M. B., Sriram, L. M. K., Pinzan, D., Ozguven, E. E., and Arghandeh, R. (2018). "Co-resilience Assessment of Hurricane-induced Power Grid and Roadway Network Disruptions: A Case Study in Florida with a Focus on Critical Facilities", Accepted for Presentation at the IEEE Conference on Intelligent Transportation Systems, Hawaii, USA, November 4-7.

[27]Lina, L., Sando, T., and Ozguven, E. (2018). Older Drivers' Behavior at On-Ramp Merging Areas. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[28]Lwambagaza, L., Sando, T., and Ozguven, E. E. (2018). "Older Drivers' Behavior at On-Ramp Merging Areas", Presented at the Transportation Research Board's 97th Annual Meeting, Washington DC, USA, January 7-11.

[29]Njobelo, G. L., Sando, T., Sajjadi, S., Mtoi, E., Sobanjo, J., and Ozguven, E. (2018). Safety Evaluation of the Advanced Stop Assist System in a Connected Vehicle Environment. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[30]Njobelo, G. L., Sando, T., Sajjadi, S., Mtoi, E., Dulebenets, M., and Sobanjo, J. (2018). Enhancing the Green Light Optimized Speed Advisory System to Incorporate Queue Formation. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[31]Ozguven, E., Ulak, M., Deng, O., Mulling, A., Kovankaya, Y., Byrd, M., and Kocatepe, A. (2018). Geographic Information System-Based Impact Analysis of Hurricane Hermine: A Case Study in Tallahassee, Florida. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[32]Pinzan, D., Kocatepe, A., Gilanifar, M., Ulak, M., Ozguven, E. E., and Arghandeh, R., "Data-driven and Hurricane-focused Metrics for Combined Transportation and Power Networks Resilience", Presented at the Transportation Research Board's 97th Annual Meeting, Washington DC, USA, January 7-11, 2018.

[33] Reed, K., Liu, K. (2018). Age-Related Physical Impairments and Road Safety Issues in Older Drivers. 31st Annual Conference of the Business and Health Administration Association (BHAA) Conference. Chicago, IL, April 18-20.

[34] Reed, KS, Egoh, A., Kalu, PN. (2018). Biomechanical Effects on Driving Ability. FAMU-FSU College of Engineering, 5th Annual Transportation Day. Tallahassee, FL, November 30.

[35] Sanusi, F., Sobanjo, J., Sando, T., and Ozguven, E. E. (2019). Measuring Impacts of Connected and Autonomous Vehicles on Freeway Work Zones. Transportation Research Board, 98th Annual Meeting. Washington DC, January 13-19, Scheduled for lectern presentation.

[36] Sriram, L. M. K., Gilanifar, M., Zhou, Y., Ozguven, E. E., and Arghandeh, R. (2018). "Multivariate Deep Casual Network for Time Series Forecasting in Interdependent Networks", Accepted for Presentation at the 57th IEEE Conference on Decision and Control (CDC), Miami Beach, FL, USA, December 17-19.

[37] Twumasi-Boakye, R., Sobanjo, J., Inkoom, S., and Ozguven, E. E. (2018). Senior Community Resilience with a Focus on Critical Transportation Infrastructures: An Accessibility-based Approach to Healthcare. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

[38] Ulak, M., Ozguven, E., Vanli, O., Dulebenets, M., and Spainhour, L. (2018). Multimodal Investigation of Crashes Involving Aging Drivers, Passengers, Bicyclists, and Pedestrians. Transportation Research Board, 97th Annual Meeting. Washington DC, January 7-11.

Website(s) or other Internet site(s)

Hosted on a computer server at FSU, a website has been developed and maintained to provide information about the Center (http://www.utc.fsu.edu/). A Facebook page is being maintained (https://www.facebook.com/The-Center-for-Accessibility-and-Safety-for-an-Aging-Population-1444922912427725/). A twitter account is also maintained at (http://twitter.com/UTC_FSU).

Technologies or techniques

Nothing to report.

Inventions, patent applications, and/or licenses

Nothing to report.

Other products

Nothing to report.

3. Participants & collaborating organizations

❖ Our UTC is a member of the *Council of University Transportation Centers (CUTC)*.

❖ There are *collaborations with public agencies:* Florida Department of Transportation (FDOT)'s Research Office; FDOT's Safe Mobility for Life Program; and FSU's Claude Pepper Institute for Aging. Also, through their membership in the external and internal advisory boards, the agency or organization (employer) of the various members were involved in the Center's activities. Some of our partners reviewed research proposals and draft final reports from the Center, and have also served as speakers at the Center's seminars and conferences.

❖ A research project was funded by the *National Science Foundation,* involving one of ASAP researchers, Dr. Eren Ozguven, as a co-Principal Investigator: Arghandeh, R. (PI), Ozguven, E. E.

(Co-PI), Hou, J., UHDNetCity: User-Centered Heterogeneous Data Fusion for Multi-Networked City Mobility, Award Amount: $233,123.00, Award Period: 09/01/2016-02/28/2018.

❖ A research project was funded by the **National Science Foundation**, involving one of ASAP researchers, Dr. Eren Ozguven, as a co-Principal Investigator: Yazici, A. (PI), Ozguven, E. E. (Co-PI), Mondros, J. (Co-PI), Boot, W. (Co-PI), Eby, D. (Co-PI), One Bridge at a Time: Bridging the Digital Divide for the Well-Being of Aging Populations in Smart and Connected Communities, Award Amount: $499.999.00, Award Period: 09/01/2017-08/31/2021.

❖ A research project was funded by the **National Science Foundation**, involving one of ASAP researchers, Dr. Eren Ozguven, as a co-Principal Investigator: Huang, W. (PI), Ozguven, E. E. (Co-PI), Hou, J., Excellence in Research: Integrated Hazard and Traffic Modeling for Massive Evacuation in Florida Under Uncertainty of Hurricane Track, Award Amount: $499,682.00, Award Period: 09/07/2018-08/31/2021.

❖ A research project was funded by the **Florida Department of Transportation,** *involving four ASAP researchers:* Maxim A. Dulebenets, PI, Co-PIs Ren Moses, John Sobanjo, and Eren E. Ozguven: Development of the Optimization Model for Improving Safety at Rail Crossings in Florida, BVD30 TWO 977-26. Award Amount: $202,126, Award Period: 09/30/2018 – 02/28/2020.

❖ For the reporting period, the following Center's affiliated faculty and graduate students have the listed *award, services, and are on the listed national, regional and local committees*:

Awards:
Olumide Abioye: *Institute of Traffic Engineers (ITE) Traffic Bowl Competition 1st place winner (2018); FAMU Graduate Research 3–Minute Thesis Competition 2nd place winner (2018); FAMU Graduate Research Poster Competition 1st place winner (2018); Bill Anderson Fund Fellow (2018)*
Shonda Bernadin: *Inspiring Leaders in STEM Award, Insight into Diversity (2017).*
Sylvia Bhattacharya, *Finalist for 3-Minute Thesis (3MT) Competition, Driver's Behavior Prediction Modeling and Mental Workload Analysis, Florida State University (2018)*
Walter Boot: *Elected Fellow, Gerontological Society of America (2017). The Earl Alluisi Award, by the American Psychological Association's Division 21 (Applied Experimental and Engineering Psychology) (2017).*
Neil Charness, *International Society for Gerontechnology Grandmaster Award (2018); American Psychological Association, Committee on Aging Award for the Advancement of Psychology and Aging (2018).*
Maxim Dulebenets: *Emerald Literati Award for article "A Novel Continuous Berth Scheduling Model at Multiple Marine Container Terminals with Tidal Considerations", published in Maritime Business Review, Emerald, United Kingdom (2018); FAMU Teaching Innovation Award Finalist (2018); Outstanding Reviewer, International Journal of Production Economics, Elsevier, Netherlands, (2018); Outstanding Reviewer, European Journal of Operational Research, Elsevier, Netherlands (2017)*
Isaac Ogunrinde, *nominated for 2018-19 Intel AI Residency Program for research proposal entitled Adaptive Intersection Assistant System for Self-Driving Cars using Deep Reinforcement Learning: Enhancing Safer Left Turn at Intersection for Elderly Drivers (2018)*
Taiwo Ojo, *nominated for 2018-19 Intel AI Residency Program for research proposal entitled Using Artificial Intelligence to investigate the impact of Adverse Weather Conditions on lane departure warning systems for Elderly Drivers (2018)*
Eren Ozguven: *IBM Faculty Award (2018).*

Dustin Souders: University Transportation Center Student of the Year (2017).

Service and committees:
Walter Boot: Associate Editor, Journal of Experimental Psychology: Applied, 2014–present.
Jeffrey Brown: Member, ABG50 Transportation History Committee, Transportation Research Board (TRB); Member and Review Coordinator, AP075 Light Rail Transit Committees, Transportation Research Board (TRB).
Neil Charness: Editorial Boards: Psychology and Aging, Journals of Gerontology: Psychological Science, Gerontechnology Journal.
Maxim Dulebenets: Invited Member, Transportation Research Board (TRB) Standing Committee on International Trade and Transportation (AT020), May 2018 – to date; Invited Member, TRB Standing Subcommittee on Port Performance (AW010(2)), TRB, Jan 2018 – to date; Membership Coordinator, Standing Committee on Ports and Channels (AW010) of the Transportation Research Board – since 2016; Invited Young Member, Standing Committee on Ports and Channels (AW010), Transportation Research Board – since 2015; Editorial Board Member, International Engineering Science Technology Online Conference, Jan 2017 – to date; Editorial Board Member, Vehicle Dynamics, Dec 2017 – to date; Editorial Board Member, Journal of Electronic & Information Systems, Nov 2018 – to date.
Michael Duncan: Member of TRB standing committee AP045 (Intermodal Transfer Facilities).
Mark Horner: Chair, ADD20 Social and Economic Factors of Transportation, Standing Committee, Transportation Research Board (TRB); Member, ABJ60, Geographic Information Sciences and Applications, Standing Committee, Transportation Research Board (TRB). U.S. Co-Editor, Transportation (Springer).
Eren Ozguven: Member, Time, Speed and Reliability (TTSR) Subcommittee, Transportation Research Board (TRB);
Member, Emerging Design and Construction Technologies Committee (TRB);
Editorial Board Member, Transportation Research Part D.
John Sobanjo: Member, Editorial Board, ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, American Society of Civil Engineers (ASCE) / American Society of Mechanical Engineers (ASME), 2014 – Present; Associate Editor, ASCE Journal of Bridge Engineering, American Society of Civil Engineers (ASCE), 2014 - Present.
Dustin Souders, Student Representative, the ANB60 TRB Committee.

4. Impact
There is not much to report at this time on the impact.

5. Changes/Problems
Nothing to report.

6. Special reporting requirements
Nothing to report.