

TOLGA ERCAN, PhD, PE



HIGHLIGHTS

- Academic scholar and project engineer specializing on sustainable transportation and intelligent transportation systems (ITS) with M.Sc. and Ph.D. degrees, PE license, and 7+ years of professional academic and consulting experience
- Expert ITS specialist with experience in various transportation projects in Connected and Autonomous Vehicle infrastructure, ITS design, traffic operations, travel demand analysis, multimodal transportation planning, signal design, economic and environmental impacts assessment.
- Successful entrepreneur co-managing \$2M+ federal research funding from U.S. government to provide technology transfer in Connected and Autonomous Vehicles infrastructure.

EDUCATION

Ph.D. in Civil Engineering

Summer 2019

University of Central Florida, Orlando, FL, USA

Dissertation Title: “*A System Dynamics Approach on Sustainability Assessment of the United States Urban Commuter Transportation*”

Dissertation Advisor: Dr. Omer Tatari

Master of Science in Civil Engineering

Fall 2013

University of Central Florida, Orlando, FL, USA

Thesis Title: “*Sustainability Analysis of Intelligent Transportation Systems*”

Thesis Advisor: Dr. Omer Tatari

Bachelor of Science in Civil Engineering

Spring 2009

Cukurova University, Adana, TURKEY

PROFESSIONAL EXPERIENCE

Connected Wise, LLC, Orlando, FL

April 2019 – Current*Co-Founder & ITS Director*

- **USDOT Small Business Innovation Research Phase-I & II Project:** An on-going project for Connected Wise to provide low-cost CAV communication infrastructure for rural areas using smart static signs. Project duties included developing hashing algorithm for cyber-secure static sign design, developing a low-cost on-board unit for vehicles that are not equipped with AV capabilities to identify and display standard safety messages to the driver using AI algorithm for roadside objects (e.g., signs, traffic lights, pedestrian, vehicles, cyclists, etc.).
- Developing and collaborating on new federal and local government funding opportunities to expand the R&D efforts of the company.

TransCore ITS, LLC

June 2018 – June 2021*Project Engineer*

- **Florida DOT District 7 District Wide ITS Consulting Services:** Task-oriented project to perform analysis and analytics for traffic and ITS studies to support the Transportation Systems Management and Operations (TSM&O) reporting. Dr. Ercan provided traffic congestion, volume, speed, safety, and economic impact reports and presentation documents as part of the District’s deliverable to the Central Office for every quarter.
- **Tampa Hillsborough Expressway All-Electronic Open Road Tolling Selmon West Extension Project:** Dr. Ercan has provided assistance to the project’s fiber optic network design and implementation, developing master test plans, supervising on-site testing (commissioning) activities, developing new design documentations, and As-Built plans production as part of the THEA’s Selmon West Extension project with three new Open Road Tolling sites.
- **Florida DOT District 7 ITS Design-Build Project:** As the project engineer, the duties included all project proposal submittals and preliminary design document preparation along with the Senior Project Engineer and Project Manager, design of nine microwave detectors, eight CCTVs, five DMS/ADMS structures, permanent back-up generators, fiber optic network, all project submittal

documents preparation, field inspections during the building stage, performing field and central testing procedures. The project is successfully completed within the budget.

- **ITS Design:** Network/Communications systems design (e.g., fiber optic cable network assignments, OTDR testing); ITS field device placements and configurations; wrong-way detection solutions, video analytics.

University of Central Florida, Orlando, FL

Jan 2014 – May 2018

Graduate Research Assistant at the Center for Advanced Transportation Systems Simulation at UCF

- *Assistant Co-PI* of the *U.S. Department of Transportation (US DOT)* funded ‘Electric Vehicle Transportation Center’ project (*Jan 2014 – May 2018*):
 - Perform alternative fuel adoption analysis of light-, medium- (delivery trucks), and heavy-duty vehicles (transit and school buses, delivery and tractor-trailer trucks) including asset management, strategic business development, fleet optimization analyses (linear and robust) by utilizing input-output model based-LCA and Monte Carlo methods.
 - Perform sustainability impact assessment analyses using hybrid-life-cycle assessment and operation research tools on new technology initiatives such as alternative fuels, ITS, SmartGrid, Vehicle-to-Grid, and Vehicle-to-Infrastructure concepts suitability for battery-electric medium- and heavy-duty vehicles with developing autonomous vehicle concepts.
 - Perform simulation and policy analysis of sustainable urban mobility assessment for mode choice of commuters in the U.S. for national or city-specific data with the combination of advanced discrete choice and system dynamics models.
- Perform data mining and/or statistical analysis on various datasets to conduct simulation analysis (i.e. discrete event, system dynamics, or agent-based methods) or multi-objective optimization analysis.
- Expert in conducting large scale impact analysis studies such as multimodal transportation design for macro and micro areas (national, region, city, network, corridor, etc.)

University of Central Florida, Orlando, FL

Aug 2016 – May 2017

Student Sustainability Advisory Committee: Transportation Sub-Committee Member (Acknowledged as internship in transcript)

- Reporting and proposing projects to the Sustainability Working Advisory Team of Transportation (faculty and staff members) for cleaner transportation initiatives throughout the campus.
- A proposal of replacing diesel shuttle buses with electric buses and incentives program for students to increase shuttle bus ridership was selected for presenting at the annual stakeholder presentation event. Proposal preparation involved communicating with UCF’s Transportation Department, faculty members, electric bus manufacturers (i.e., Proterra), and other student advisory committee members.

SOFTWARE SKILLS

- Programming (VisualBasic, MATLAB, Fortran, Python)
- Planning/Design (MicroStation, HCS, AutoCAD, ArcGIS)
- Simulation (VENSIM, AnyLogic, LINGO, ExcelSolver)
- Scheduling (Primavera, MS Project)
- Statistics (SPSS, STATA, MINITAB, SAS)
- MS Office, MS Visio, Tableau

AWARDS and LICENSES

- 2013 Anne S. Brewer academic scholarship awardee from Intelligent Transportation Society of Florida (ITS Florida).
- Professional Engineer in Florida (**License #92406**)
- FDOT Advanced Level Temporary Traffic Control Certification

FELLOWSHIP and GRANTS

- **Ministry of National Education Fellowship** **2011 – 2018**
Amount: Covering all graduate study expenses abroad
- **U.S. Department of Transportation, Small Business Innovation Research Grant Phase-I** **2018 – 2019**
Amount: \$150,000
Recipient: Connected Wise, LLC
Role: Co-PI and ITS Specialist
Topic:
- **U.S. Department of Transportation, Small Business Innovation Research Grant Phase-II** **2019 – 2021**
Amount: \$800,000

Recipient: Connected Wise, LLC
 Role: Co-PI and ITS Project Manager
 Topic:

- **U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy Grant** **2021 – 2024**
 Amount: \$5,000,000
 Recipient: VECTOR Consortium - University of South Florida as the PI of the project
 Role: Project PI for Connected Wise team (Connected Wise, LLC is the sub-recipient of the project with \$1.5M budget allowance).
 Topic:
- **U.S. Department of Transportation, Small Business Innovation Research Grant Phase-I** **2022 – 2023**
 Amount: \$150,000
 Recipient: Connected Wise, LLC
 Role: Senior ITS Engineer
 Topic:

ACADEMIC PUBLICATIONS

- **Ercan T**, Kucukvar M, Tatari O, Al-Deek H. “*Congestion Relief Based on Intelligent Transportation Systems in Florida*”. Transportation Research Records Journal of Transportation Research Board 2013; 2380:81–9. [Citation No: 18]
- **Ercan T**, Tatari O. “*A hybrid life cycle assessment of public transportation buses with alternative fuel options*”. International Journal of Life Cycle Assessment 2015; 20:1213–31. [Citation No: 92]
- **Ercan T**, Zhao Y, Tatari O, Pazour JA. “*Optimization of transit bus fleet’s life cycle assessment impacts with alternative fuel options*”. Energy 2015; 93:323–34. [Citation No: 82]
- **Ercan T**, Noori M, Zhao Y, Tatari O. “*On the Front Lines of a Sustainable Transportation Fleet: Applications of Vehicle-to-Grid Technology for Transit and School Buses*”. Energies 2016; 9(4), 230. [Citation No: 30]
- **Zhao Y**, **Ercan T**, Tatari O. “*Life Cycle Based Multi-Criteria Optimization for Optimal Allocation of Commercial Delivery Truck Fleet in the United States*”. Sustainable Production and Consumption; 2016; 8: 18-31. [Citation No: 26]
- **Ercan T**, Onat NC, Tatari O. “*Investigating Carbon Footprint Reduction Potential of Public Transportation in U.S.: A system Dynamic Approach*”. Journal of Cleaner Production; 2016; 133: 1260-1276. [Citation No: 115]
- **Ercan T**, Onat NC, Tatari O, Mathias J-D, “*Public transportation adoption requires a paradigm shift in urban development structure*”. Journal of Cleaner Production 2016, 142, 1789–1799. [Citation No: 57]
- **Sen B**, **Ercan T**, Tatari O. “*Does a battery-electric truck make a difference? –Life cycle emissions, costs, and externality analysis of alternative fuel-powered Class 8 heavy-duty trucks in the United States*”. Journal of Cleaner Production; 2017; 141. [Citation No: 182]
- **Golestani B**, **Nam BH**, **Ercan T**, **Tatari O**, “*Life-Cycle Carbon, Energy, and Cost Analysis of Utilizing Municipal Solid Waste Bottom Ash and Recycled Asphalt Shingle in Hot-Mix Asphalt*” Proceedings of Geotechnical Frontiers 2017, 333-344. [Citation No: 6]
- **Sen, B.**, **Ercan, T.**, **Tatari, O.**, and **Zheng, QP.** “*Robust Pareto optimal approach to sustainable heavy-duty truck fleet composition*” Resources, Conservation and Recycling, 2019, 146, 502-513. [Citation No: 19].
- **Karaaslan E**, **Sen B**, **Ercan T**, **Laman, H**, **Pol J.** “*Reading vehicular messages from smart road signs: A novel method to support Vehicle-To-Infrastructure in rural settings.*” Transportation Research Record, 2020, 2675 (11), 150-158 [Citation No: 1].
- **Karaaslan E**, **Zakaria M**, **Ercan T**, **Sen B**, **Laman H**, **Banihashemi M**, **Pol J.** “*Encrypted transfer of traffic sign information for advanced driving assistance systems using invisible security patches.*” Transportation Research Record, 2021, [Citation No: 1].
- **Ercan T**, **Onat NC**, **Keya N**, **Tatari O**, **Eluru N.**, **Kucukvar M.** “*Autonomous electric vehicles can reduce carbon emissions and air pollution in cities*”, Transportation Research Part D: Transport and Environment, 2022, (112), 103472 [Citation No: 2].

CONFERENCE PRESENTATIONS

- **Ercan T**, **Kucukvar M.**, **Tatari O.**, **Al-Deek H.**, “*Triple Bottom Line Sustainability Impact Analysis of ITS-related Congestion Relief in Florida: The Complete Picture*” Transportation Research Board 92nd Annual Meeting, 13-17 January 2013, Washington DC, USA.

- **Ercan T**, Gumus S., Tatari O., “*Efficiency Analysis of Intelligent Transportation Systems in the U.S.: Fuzzy-DEA Approach*”, International Conference on Engineering and Applied Sciences Optimization (OPT-i), 2-4 June 2014, Kos Island, Greece.
- **Ercan T**, Noori M., Zhao Y., Tatari O., “*Understanding the future of electricity grid integrity: Applications of vehicle-to-grid technology in transit and school buses*”, International Symposium on Sustainable Systems and Technology (ISSST), 16-18 May 2016, Phoenix, AZ, USA.
- Sen B, **Ercan T**, Tatari O. “*Does the electrification of U.S. heavy-duty trucks make a difference?*” Transportation Research Board 96nd Annual Meeting, 8-12 January 2017, Washington DC, USA.
- **Ercan T**, Keya N, Onat NC, Tatari O, Eluru N. “*Sustainability Performance Simulation of the U.S. Urban Mobility Policies*”, Transportation Research Board 97th Annual Meeting, 7-11 January 2018, Washington DC, USA.
- **Ercan, T.**, Sen, B. Tursky, J., “*Life Cycle Assessment of Intelligent Transportation Systems: A Case Study from Southwest Florida*” Florida’s I3 Transportation Showcase, 23-26 June 2019, Orlando, FL, USA
- Karaaslan, E., Sen, B., **Ercan, T.**, Laman, H., Pol, J., (2020). “*Artificial Intelligence Embedded On-Board Machine Vision System to Support Vehicle to Infrastructure*”, Transportation Research Board 99th Annual Meeting, January 2020, Washington, DC, USA.
- Karaaslan E, Sen B, **Ercan T**, Laman, H, Pol J. (2021). “*Smart Traffic Signs to Support Infrastructure-to-Vehicle Communication in the Rural Settings.*” Transportation Research Board 100th Annual Meeting, 5-29 January 2021 (Virtual Conference), Washington DC, USA.
- Karaaslan E, Zakaria M, **Ercan T**, Sen B, Laman H, Banihashemi M, Pol J. (2022). “*Encrypted Transfer of Traffic Sign Information for ADAS Using Invisible Security Patches.*” Transportation Research Board 101st Annual Meeting, 9-13 January 2022, Washington DC, USA.

REVIEWER ASSIGNMENTS

- Resources, Conservation and Recycling, Elsevier [IF: 8.086]
- Journal of Cleaner Production, Elsevier [IF: 7.249]
- The International Journal of Life Cycle Assessment, Springer [IF: 4.307]
- Environmental Impact Assessment Review, Elsevier [IF: 4.135]
- Energy Strategy Reviews, Elsevier [IF: 3.895]
- Advanced Engineering Informatics, Elsevier [IF: 3.879]
- Transportation Research Record, Sage Publication [IF: 1.560]
- Case Studies on Transport Policy, Elsevier [IF: 2.670]

PROFESSIONAL AFFILIATIONS

- American Society of Civil Engineers, Intelligent Transportation Society of Florida