Brian M. Staes

Postdoctoral Scholar
Glenn Department of Civil Engineering
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QUALIFICATIONS

Education

Ph.D.	Oregon State University, Civil Engineering Dissertation: *Enhancing Transportation Operational System Resilience: Predictive Modeling for Extreme Traffic Congestion and Future Climate-Induced Rail Infrastructure Risks*	2025
M.S.	University of South Florida, Civil Engineering (Transportation) Thesis: *Diagnosis of Freeway Bottlenecks During the Mass Evacuation for Hurricane Irma on Florida's Turnpike Mainline*	2020
B.S.	Florida Gulf Coast University, Civil Engineering, *cum laude*	2018

Experience

Clemson University 2025-Present
Postdoctoral Glenn Department of Civil Engineering
School of Civil and Environmental Engineering and Earth Sciences

Oregon State University 03/2025-09/2025
Postdoctoral Scholar, School of Civil and Construction Engineering

Oregon State University 2021-2025
Ph.D. Student, School of Civil and Construction Engineering,
Graduate Research Assistant

University of South Florida 2018-2020
Center for Urban Transportation Research,
Graduate Research Assistant

Florida Gulf Coast University 2016-2018
Teaching Assistant: Engineering Statics and Dynamics, Mechanics of Materials, and Structural Analysis

PUBLICATIONS – Google Scholar Link

Referred Journal Articles

1. Sedighi, F., B.M., Staes, Ghoreishi, B., and Wang, H. A Community-Driven Recommender System for Speed Safety Camera Policy Using Large Language Models and Knowledge Graphs. (Working Paper).
2. Staes, B.M, Ghoreishi, B., Liu, C., and Wang, H. Future extreme heat will require multi-billion-dollar rail upgrades and continual maintenance in the United States. Working paper to be submitted to *Nature Communications*.
3. Staes, B.M., Bertini, R.L., and Wang, H. The Length-Based Cell-State Model: A Downscaled Macroscopic Transportation Network Model. Working paper to be submitted to *Transportation Research Part B*.

4. Ghoreishi, B, Staes, B.M., and Wang, H. A National Railway Flood Risk Assessment Based on Local Climatological Data Sensor Records and Downscaled Climate Scenarios. (Working Paper).
5. Ghoreishi, B., Staes, B.M., Liu, C., and Wang, H. (2025). Mapping Climate Extremes and Infrastructure Vulnerability: A New Database for U.S. Railroads. Submitted to *Nature Scientific Data* [Under Review]
6. Yue, K., Staes, B.M., Wang, H., and Zhang, W. (2025). BIM-based adaptive Monte Carlo Localization (AMCL) Method for Indoor Mobile Robot. Submitted to *Measurement* [Under Review]
7. Liu, C., Staes, B.M., and Wang, H. (2025) Evacuation time estimates for life safety in Tsunami Hazards. *International Journal of Disaster Risk Reduction*, *119,* 105327. https://doi.org/10.1016/j.ijdrr.2025.105237.
8. Liu, C., Staes, B.M., and Wang, H. (2024). Application of Least-Cost Distance Model and Agent-Based Model in Evacuation Time Estimate. Available at SSRN: https://ssrn.com/abstract=4917159
9. Staes, B. M., Wang, H., and Bertini, R. L. (2024). Development of a Length-Based Cell-State Framework Toward the Re-Creation of Large-Scale Dense Congestion Patterns. *Transportation Research Record*, 2687(11). https://doi.org/10.1177/03611981241243328
10. Siam, M.R.K., Staes, B.M., Lindell, M.K. and Wangm H. (2024). Lessons Learned From the 2018 Attica Wildfire: Households' Expectations of Evacuation Logistics and Evacuation Time Estimate Components. *Fire Technology, 61*. https://doi.org/10.1007/s10694-024-01640-7
11. Staes, B.M., Bertini, R.L., and Menon, N. (2022). Improving Mapping and Selection of Low-Speed Autonomous Vehicle Shuttle Routes: A Data-Driven Framework. *Automated People Movers and Automated Transit Systems*, pp. 1-13. doi.org/10.1061/9780784484388.001
12. Yuksel, E., Bertini, R.L., Li, X., Staes, B.M., and Ozkul, S. (2022). Data-Driven Computation of State-Dependent Passenger Car Equivalency for Multiple Truck Lengths. *Transportation Research Record,* 2676(11). doi:10.1177/03611981221092008
13. Staes, B.M., Bertini, R.L., Menon, N., and Yuksel, E. (2021). Examining Freeway Bottleneck Features During a Mass Evacuation. *Transportation Research Record*, 2675(9). doi:10.1177/03611981211003588
14. Staes, B., Menon, N., and Bertini, R.L. (2021) Analyzing transportation network performance during emergency evacuations: Evidence from Hurricane Irma. Transportation Research Part D: Transport and Environment. 95, 102841.
15. Yuksel, E., Bertini, R.L., Menon, N., Ozkul, S., and Staes, B., (2020). A Contemporary Approach for Visualizing Temporal and Spatial Urban Freight Movement by Leveraging Mobility Portal Data. *2020 Forum on Integrated and Sustainable Transportation Systems (FISTS)*, pp. 272-279. doi: 10.1109/FISTS46898.2020.9264848

Reports

1. Wang, H., Staes, B. M., & Ghoreishi, B. (2025). *Developing an integrated risk assessment framework to quantify the resilience of critical railway infrastructure: Characterization of risks and hazards to the U.S. rail network through empirical data and past events.* Mineta Transportation Institute. https://doi.org/10.31979/mti.2025.2413

2. Figliozzi, M., Semensky, S., Wang, H., Staes, B.M., and Sedighi, F. Improving Guidance for Speed Safety Camera. Final Report, Oregon Department of Transportation SPR Project no. 873.
3. Wang, H., Li, X., Louis, J., and Staes, B.M., 2023. Piloting Smart Work Zone Technologies to Provide Real-Time Lane Closure Information to Improve Oregon Highway Safety and Mobility. Final Report, Oregon Department of Transportation SPR Project no. 860.
4. Wang, H., Li, X., Siam, M.R.K., and Staes, B.M., 2023. Improved Systemic Analysis to Predict Roadway Safety performance. Final Report, Oregon Department of Transportation SPR Project No. 849.
5. "Risk and Resilience of Railway Infrastructure." Federal Railroad Administration Center for Surface Transportation Testing and Academic Research (C-STTAR). Subproject lead Dr. Haizhong Wang, Oregon State University 2022. [Ongoing]
6. Menon, N., Staes, B., Bertini, R.L., 2020. Measuring Transportation Network Performance During Emergency Evacuations: A Case Study of Hurricane Irma and Woolsey Fire. Report prepared for Center for Transportation, Equity, Decisions and Dollars (CTEDD) 19-04 SG, U.S. Department of Transportation University Transportation Center.

Funded Research Proposals

1. Pan, B. (P.I.), Wang, H., Taff, D., Newman, P. "Risk preparedness and resilience planning for emergency evacuations of Wrangell-St Elias National Park". National Park Service, Department of Interior. [Funded, $520,524]
2. "Improving Guidance for Automated Speed Enforcement". Oregon Department of Transportation, 2023. 24-26 Project PI: Dr. Haizhong Wang, Oregon State University 2023. [Funded, $140,000]
3. "Planning for a Climate-Resilient Rail System by Training Existing and Investing in the Future Workforce (REIN-FORCE)." Federal Railroad Administration Center for Surface Transportation Testing and Academic Research (C-STTAR) Consortium. Subproject lead: Dr. Haizhong Wang, Oregon State University 2022. [Funded, $1,086,384]
4. "Risk and Resilience of Railway Infrastructure." Federal Railroad Administration Center for Surface Transportation Testing and Academic Research (C-STTAR). Subproject lead Dr. Haizhong Wang, Oregon State University 2022. [Funded, $796,506]
5. Wang, H., Li, X., Louis, J., and Staes, B.M., 2023. Piloting Smart Work Zone Technologies to Provide Real-Time Lane Closure Information to Improve Oregon Highway Safety and Mobility. Final Report, Oregon Department of Transportation SPR Project no. 860. 2021. [Funded, $181,500]

Conference Presentations

1. Wang, H., Sedighi, F., and B.M., Staes. Assessing Public Perception and Acceptance to Speed Safety Camera (SSC) Policy using Large Language Models and Knowledge Graphs in Oregon. The 10th International Symposium on Transportation Safety, Tongji University, July 2025 [Talk].
2. Staes, B.M., Ghoreishi, B., Liu, C, Wang, H., and Bertini, R. Development of a Simplified Risk Analysis Framework for Rail Thermal Buckling Under Future Climatic

Extremes. 104th Annual Meeting of the Transportation Research Board, Washington D.C., January 2025 [Poster]

3. Ghoreishi, B., Staes, B.M., Liu, C., Wang, H., and Bertini, R. Curation of a Natural Hazards Database for U.S. Railroad Infrastructure. 104th Annual Meeting of the Transportation Research Board, Washington D.C., January 2025 [Poster]
4. Liu, C., Wildman, C., Staes, B.M., Bosa, A., Brand, B., Cova, T.J., Lindell, M.K., and Wang, H. Optimizing Wildfire Evacuation Warnings: An Agent-Based Approach for Effective Protective Action Recommendations. 104th Annual Meeting of the Transportation Research Board, Washington D.C., January 2025 [Poster]
5. Staes, B.M., Wang, H., and Bertini, R.L. Development of a Length-Based Cell-State Framework Towards the Recreation of Large-Scale Dense Congestion Patterns. 103rd Annual Meeting of the Transportation Research Board, Washington D.C., January 2024 [Poster]
6. Staes, B.M., Wang, H., and Bertini, R.L. Incorporation of the Length-Based Cell-State Framework Towards the Simulation and Prediction of Large-Scale Freeway Traffic Dynamics. 103rd Annual Meeting of the Transportation Research Board, Washington D.C., January 2024 [Poster]
7. Staes, B.M., Menon, N., and Bertini, R.L. The Impact of Covid-19 on Telecommuting: A Study of Likelihood and Preference. 103rd Annual Meeting of the Transportation Research Board, Washington D.C., January 2024 [Poster]
8. Paczia, J., Staes, B.M., Bertini, R.L., Hoffman, S., Rehborn, H., Stein, O., Bernhardt, and Xu, J. Congested Pattern Analysis in the Framework of Kerner's Three-Phase Traffic Theory: A Comparison Between U.S. and German Probe Vehicle Data. 102nd Annual Meeting of the Transportation Research Board, Washington D.C., January 2023 [Poster]
9. Liu, C., Staes, B.M., and Wang, H. An Interdisciplinary Agent-Based Tsunami Evacuation Model of Tourists: Evacuation Choices and Life Safety 102nd Annual Meeting of the Transportation Research Board, Washington D.C., January 2023 [Poster]
10. Staes, B.M. The Convolution of Radar Sensors and Probe Vehicle Data to Better Travel Time Estimations by Incorporation Bottleneck Traffic Stationarity. National Travel Monitoring Exposition and Conference (NaTMEC), Boise, Idaho, June 15, 2022 [Talk].
11. Staes, B.M., Bertini, R.L., and Menon, N. A Data-Driven Framework for Identifying Low-Speed Autonomous Vehicle Shuttle Routes. ASCE International Conference on Transportation & Development, Seattle, Washington, June 2022 [Poster]
12. Staes, B.M., Bertini, R.L., and Menon, N. Improving Mapping and Selection of Low-Speed Autonomous Vehicle Shuttle Routes: A Data-Driven Framework. 101st Annual Meeting of the Transportation Research Board, Washington D.C., January 2022 [Poster]
13. Staes, B.M., Bertini, R.L., Menon, N., and Yuksel, E. Examining Freeway Bottleneck Features During a Mass Evacuation. 100th Annual Meeting of the Transportation Research Board, Washington D.C., January 2021 [Talk, Poster]
14. Staes, B. Identification of Roadway Bottlenecks in Mass Hurricane Evacuations: A Florida Case Study Hurricane Irma. 99th Annual Meeting of the Transportation Research Board, Washington D.C., January 2020 [Poster]

15. Staes, B., Yuksel, E., Menon, N., and Bertini, R.L. "Visualizing Transit Network Performance by Leveraging Big Data," Ninth International Visualization in Transportation Symposium, National Academy of Sciences, Washington, D.C., November 5–6, 2019 [Talk]

Teaching Experience

1. Examining Freeway Bottleneck Features During A Mass Evacuation. CE 507, Oregon State University, January 15, 2021. [Seminar]
2. Introduction to Traffic Flow Theory III: Queueing Theory. CE491 Transportation Engineering, Oregon State University, October 10, 2022. [Lecture]
3. In Class Design Problem (ICDP), Freeway Congestion – Queuing Analysis. CE491 Transportation Engineering, Oregon State University, April 23, 2023 [Recitation]
4. Development of a Simplified Length Based Cell Transmission Model for Regional Evacuations and Congestion Prediction. Technical University of Munich. July 18, 2023. [Lecture]
5. Implications of Fundamental Diagram Calibration During Natural Hazards: Class Project Overview. CE 593 Traffic Flow Analysis and Control, October 10, 2023. [Lecture]
6. Signal Design and Timing Basics. CE491 Transportation Engineering, Oregon State University, November 27 & 29, 2023. [Lecture]
7. LOS of Signalized Intersections. CE491 Transportation Engineering, Oregon State University, December 04, 2023. [Lecture]
8. Introduction to Traffic Flow Theory I: Time Space Diagram. CE 593 Traffic Flow Analysis and Control, October 10, 2024. [Lecture]
9. Macroscopic Traffic Stream Models. CE 593 Traffic Flow Analysis and Control, October 17, 2024. [Lecture]

Professional Registration

2023 / Civil P.E. / Florida / Exam Passed Pending Years Worked/Years of Teaching

Professional Service & Leadership

Transportation Research Board (TRB), Young Member, AR080 Highway/Rail Grade Crossings 2023, 2024, 2025

University of South Florida, Institute of Transportation Engineers (ITE) Student Chapter: Director of Events 2019, Vice President 2020

Florida Gulf Coast University, American Society of Civil Engineers (ASCE) Student Chapter: Steel Bridge Co-Captain, 2017

Awards and Honors

Milton Pikarsky Memorial Award, Council of University Transportation Centers (CUTC) national student award for the best master's thesis in the field of science and technology in transportation studies, 2022

Cunard Award, Best first young author paper in the area of operations for the Transportation Research Board, 2022

Pacific Northwest Transportation Consortium (PacTrans) University Transportation Council (UTC) Student of the Year, 2021

Dwight David Eisenhower Transportation Fellowship, Federal Highway Administration 2019, 2020, 2021,2022

Center for Transportation Equity, Decisions and Dollars (CTEDD) University Transportation Council (UTC) Student of the Year, 2019

Georgia Brosch Memorial Transportation Scholarship, Center for Urban Transportation Research, 2019

Student Academic Competitions

The National Operations Center of Excellence (NOCoE), Transportation Technology Tournament. Selected to compete in the national competition:
2019, Improving Pedestrian Safety through ITS solutions
2020, Mitigating work zone incidents and improving work zone safety through ITS technologies

Intelligent Transportation Society of America (ITS America), ITS World Congress: Global Challenge. Selected to compete in the national competition:
2020, ITS Strategies for Reducing Congestion and Incidents while Improving Mobility for the City of Tampa, Florida