

# Brian M. Staes

Assistant Professor (Starting August 1, 2026)  
School of Environmental, Civil, Agricultural & Mechanical Engineering  
University of Georgia  
Email: bstaes15@gmail.com | Website: brianstaes.github.io

## EDUCATION

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**Ph.D.**, Civil Engineering 2025  
Oregon State University  
*Dissertation: Enhancing Transportation Operational System Resilience: Predictive Modeling for Extreme Traffic Congestion and Future Climate-Induced Rail Infrastructure Risks*

**M.S.**, Civil Engineering (Transportation) 2020  
University of South Florida  
*Thesis: Diagnosis of Freeway Bottlenecks During the Mass Evacuation for Hurricane Irma on Florida's Turnpike Mainline*

**B.S.**, Civil Engineering, *cum laude* 2018  
Florida Gulf Coast University

## EXPERIENCE

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**University of Georgia** Starting August 2026–Present  
Assistant Professor, School of Environmental, Civil, Agricultural & Mechanical Engineering

**Clemson University** 09/2025–08/2026  
Postdoctoral Scholar, 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 and Graduate Research Assistant, School of Civil and Construction Engineering

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

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

## PUBLICATIONS

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Google Scholar profile

## Refereed Journal Articles

- [1] Sedighi, F., **Staes, B.M.**, Ghoreishi, B., and Wang, H. A community-driven recommender system for speed safety camera policy using large language models and knowledge graphs. Under review, *Transportation Research Part A*.

- [2] **Staes, B.M.**, Ghoreishi, B., Liu, C., and Wang, H. Future extreme heat will drive U.S. rail capital upgrades, maintenance needs, and operational delays. Working paper, to be submitted to *Earth's Future*.
- [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. Flash-flood exposure and intensifying rainfall extremes as critical challenges for the U.S. railroad. Under review, *Nature Communications*.
- [5] Yue, K., **Staes, B.M.**, and Zhang, W. BIM-based adaptive Monte Carlo localization (AMCL) method for indoor mobile robot. *Measurement*, 271 (2026): 120943. <https://doi.org/10.1016/j.measurement.2026.120943>
- [6] Ghoreishi, B., **Staes, B.M.**, Liu, C., et al. Mapping climate extremes and infrastructure vulnerability: a new database for U.S. railroads. *Scientific Data*, 12, 1932 (2025). <https://doi.org/10.1038/s41597-025-06205-z>
- [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, 105237. <https://doi.org/10.1016/j.ijdr.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 Wang, 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. <https://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). <https://doi.org/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). <https://doi.org/10.1177/036119812111003588>
- [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. <https://doi.org/10.1109/FISTS46898.2020.9264848>

## Reports

- [1] Wang, H., **Staes, B.M.**, and Ghoreishi, B. (2026). *Identification of At-Risk Rail Network Segments and Development of Fragility-Based Resilience Metrics*. Mineta Transportation Institute. Prepared for the Federal Railroad Administration, Contract No. 69A36523420190CRSCA. (Under Review).
- [2] Wang, H., **Staes, B.M.**, and 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. Prepared for the Federal Railroad Administration, Contract No. 69A36523420190CRSCA. <https://doi.org/10.31979/mti.2025.2413>
- [3] Figliozi, M., Semensky, S., Wang, H., **Staes, B.M.**, and Sedighi, F. (2025). Improving guidance for speed safety camera. Final Report, Oregon Department of Transportation, SPR Project No. 873.
- [4] 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.
- [5] 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.
- [6] Menon, N., **Staes, B.**, and Bertini, R.L. (2020). Measuring transportation network performance during emergency evacuations: a case study of Hurricane Irma and the Woolsey Fire. Report prepared for the Center for Transportation, Equity, Decisions and Dollars (CTEDD), U.S. Department of Transportation University Transportation Center.

## Funded Research Proposals

- [1] Pan, B. (PI), Wang, H., Taff, D., and Newman, P. Risk preparedness and resilience planning for emergency evacuations of Wrangell-St. Elias National Park. Research Associate: **Staes, B.M.**, National Park Service, Department of the Interior. [Funded, \$520,524]
- [2] Improving guidance for automated speed enforcement. Oregon Department of Transportation, 24-26 Project. PI: Dr. Haizhong Wang, Research Associate: **Staes, B.M.**, 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), a subproject of *A Comprehensive Approach to Promoting Railroad Careers and Developing the Current Rail Industry Workforce*, Federal Railroad Administration, Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program. Subproject lead: Dr. Haizhong Wang, Research Associate: **Staes, B.M.**, Oregon State University, 2022. [Funded, \$1,086,384]
- [4] Risk and Resilience of Railway Infrastructure, a subproject of the *Climate Change and Extreme Events Training and Research (CCEETR) Program*, Federal Railroad Administration, Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program. Subproject lead: Dr. Haizhong Wang, Research Associate: **Staes, B.M.**, Oregon State University, 2023. [Funded, \$796,506]
- [5] Wang, H., Li, X., Louis, J., and **Staes, B.M.** Piloting smart work zone technologies to provide real-time lane closure information to improve Oregon highway safety and mobility. Oregon Department of Transportation, SPR Project No. 860, 2021. [Funded, \$181,500]

## Conference Presentations

- [1] Ghoreishi, B., **Staes, B.M.**, Sedighi, F., and Wang, H. A data-driven approach to flash flood risk mapping for U.S. railroad infrastructure. 105th Annual Meeting of the Transportation Research Board, Washington, D.C., January 2026. [Poster]
- [2] **Staes, B.M.**, Wang, H., and Bertini, R. The length-based cell-state model: a macroscopic transportation network model. 105th Annual Meeting of the Transportation Research Board, Washington, D.C., January 2026. [Poster]
- [3] Parkinson, C., Pan, B., Taff, D., **Staes, B.M.**, Sedighi, F., Wang, H., and Newman, P. Disaster preparedness and emergency evacuation for national and state parks. GWS Park Forum 2025, University of Montana, Missoula, October 2025. [Talk]
- [4] Sedighi, F., **Staes, B.M.**, Ghoreishi, B., Jing, X., and Wang, H. EvacLLM: an open-source large language model framework for predicting household evacuation decisions and departure times. 2025 Southeast CASC Regional Science Symposium, September 2025. [Poster]
- [5] Wang, H., Sedighi, F., and **Staes, B.M.** Assessing public perception and acceptance of speed safety camera (SSC) policy using large language models and knowledge graphs in Oregon. 10th International Symposium on Transportation Safety, Tongji University, July 2025. [Talk]
- [6] **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]
- [7] 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]
- [8] 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]
- [9] **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]
- [10] **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]
- [11] **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]
- [12] 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]
- [13] 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]

- [14] **Staes, B.M.** The convolution of radar sensors and probe vehicle data for better travel time estimation by incorporating bottleneck traffic stationarity. National Travel Monitoring Exposition and Conference (NaTMEC), Boise, Idaho, June 2022. [Talk]
- [15] **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 and Development, Seattle, Washington, June 2022. [Poster]
- [16] **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]
- [17] **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]
- [18] **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]
- [19] **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 2019. [Talk]

## TEACHING EXPERIENCE

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- [1] Examining freeway bottleneck features during a mass evacuation. CE 507, Oregon State University, January 2021. [Seminar]
- [2] Introduction to traffic flow theory III: queueing theory. CE 491 Transportation Engineering, Oregon State University, October 2022. [Lecture]
- [3] In-class design problem (ICDP), freeway congestion, queueing analysis. CE 491 Transportation Engineering, Oregon State University, April 2023. [Recitation]
- [4] Development of a simplified length-based cell transmission model for regional evacuations and congestion prediction. Technical University of Munich, July 2023. [Lecture]
- [5] Implications of fundamental diagram calibration during natural hazards: class project overview. CE 593 Traffic Flow Analysis and Control, October 2023. [Lecture]
- [6] Signal design and timing basics. CE 491 Transportation Engineering, Oregon State University, November 2023. [Lecture]
- [7] Level of service of signalized intersections. CE 491 Transportation Engineering, Oregon State University, December 2023. [Lecture]
- [8] Introduction to traffic flow theory I: time-space diagram. CE 593 Traffic Flow Analysis and Control, October 2024. [Lecture]
- [9] Macroscopic traffic stream models. CE 593 Traffic Flow Analysis and Control, October 2024. [Lecture]

## **PROFESSIONAL REGISTRATION**

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Civil P.E. Exam Passed, Florida, 2023, Pending Years of Experience for Licensure.

## **PROFESSIONAL SERVICE & LEADERSHIP**

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IEEE Intelligent Transportation Systems Society (ITSS), Educational Activities, Short & Summer Courses Chair, 2026.

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

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**

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

Cunard Award, best first young-author paper in the area of operations, 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, 2019–2022.

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**

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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.