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EDUCATION

- 2012** **University of California, Berkeley**
Ph.D., Civil and Environmental Engineering
Advisor: Carlos F. Daganzo
Minors: City & Regional Planning; Industrial Engineering & Operations Research
- 2006** **University of Central Florida**
M.S., Civil Engineering
Advisor: Mohammed Abdel-Aty
Minor: Statistics
- 2005** **University of Central Florida**
B.S., Civil Engineering
Summa Cum Laude with University Honors

PROFESSIONAL REGISTRATION

EIT **State of Florida, No. 110010193**

RESEARCH INTERESTS

Urban mobility; traffic operations and control; transportation network modeling; traffic flow theory;
traffic safety modeling and management; safety data analysis; multimodal transportation operations

RESEARCH AND WORK EXPERIENCE

- 2012—** **The Pennsylvania State University**
2023— *Interim Director*
Larson Transportation Institute
- 2023—** *Professor of Civil Engineering*
Department of Civil and Environmental Engineering
- 2018—2023** *Associate Professor of Civil Engineering*
Department of Civil and Environmental Engineering
- 2012—2018** *Assistant Professor of Civil Engineering*
Department of Civil and Environmental Engineering
- 2018—** **Vanasse Hangen Brustlin, Inc. (VHB)**
Senior Safety Engineer
Sabbatical performed at VHB during Spring 2020

- 2007—2012 **University of California, Berkeley**
Graduate Student Researcher
 Volvo Center for Future Urban Transport
- 2006—2007 **Traffic Planning and Design, Inc.**
Traffic Engineer
- 2005—2007 **University of Central Florida**
Graduate Research Assistant
 Center for Advanced Transportation Systems Simulation
- 2001—2005 **Devo Engineering**
Engineering Technician
2003 Employee of the Year

AWARDS AND HONORS

- 2022 **PSEAS Premier Teaching Award**, Penn State Engineering Alumni Society
- 2022 **Project of the Year Award**, Pennsylvania Intelligent Transportation Society (ITS)
SMART Intersection multimodal safety countermeasure study, Pennsylvania Department of Transportation – for the Pennsylvania DOT
- 2022 **Best Paper Award**, TRB Committee on Safety Performance and Analysis (ACS20)
Application of emerging data sources for pedestrian safety analysis in Charlotte, NC.
- 2020 **“Sweet Sixteen” High-Value Research Project in Maintenance and Safety**, AASHTO
 Research Advisory Committee
Regionalized Urban/Suburban Collector Road Safety Performance Functions (SPFs) – for the Pennsylvania DOT
- Fall 2019 **Student’s Choice Award for Excellence in Graduate Teaching**, Penn State Department of
 Civil and Environmental Engineering
- Spring 2019 **Student’s Choice Award for Excellence in Graduate Teaching**, Penn State Department of
 Civil and Environmental Engineering
- 2018 **PSEAS Outstanding Teaching Award**, Penn State Engineering Alumni Society
- 2018 **Harry West Teaching Award**, Penn State Department of Civil and Environmental
 Engineering
- 2018 **Faculty Early Career Development (CAREER) Award**, National Science Foundation
- 2018 **Outstanding Reviewer**, Accident Analysis and Prevention
- 2018 **Outstanding Reviewer**, Transportation Research Part B: Methodological
- 2018 **Outstanding Reviewer**, Transportation Research Part C: Emerging Technologies
- 2017 **Fred Burggraf Outstanding Paper Award**, TRB Operations and Preservations Group
Estimating the impacts of bus stops of transit signal priority on intersection operations: A queueing and variational theory approach
- 2017 **D. Grant Mickle Outstanding Paper Award**, TRB Operations and Traffic Management
 Section
Improving street network efficiency by dynamically prohibiting left turns at signalized intersections
- 2017 **High-Value Research Project in Maintenance and Safety**, AASHTO Research Advisory
 Committee
Speed limits set lower than engineering recommendations – for the Montana DOT
- 2016 Cambridge Systematics **New Faculty Award**, Council for University Transportation Centers
- 2014 **Certificate of Excellence in Reviewing**, Transportation Research Part B: Methodological

2014	Best Presentation Award , American Control Conference <i>Statistical mechanics-inspired framework for studying the effects of mixed flows on highway congestion</i>
2013	Best Poster Award , World Conference on Transport Research <i>Development of an empirical model of pavement roughness with condition survey data</i>
2013	Cunard Outstanding Paper Award , TRB Operations and Traffic Management Section <i>Inhomogeneous flow patterns in undersaturated road networks: Implications for Macroscopic Fundamental Diagram</i>
2012	Gordon F. Newell Award for Excellence in Transportation Science UC Berkeley Transportation Engineering Faculty
2012	University of California Transportation Center Outstanding Student of the Year
2011	FHWA Dwight D. Eisenhower Graduate Fellowship
2007	UC Berkeley Graduate Fellowship
2007	University of California Transportation Center Fellowship
2006	ASCE Florida Section Graduate Student of the Year
2006	University of Central Florida Center for Advanced Transportation Systems Simulation Student Scholarship
2006	Central Florida ASHE Student Scholarship
2006	1st place ASCE Southeastern Region Student Transportation Competition
2005	University of Central Florida Graduate Provost Fellowship
2005	ITS Florida Graduate Student Scholarship
2005	Finalist for Order of the Pegasus (highest award given to UCF student)
2001	UCF High Achievement Scholarship

PUBLICATIONS

- * indicates student or postdoc that I advised
- ** indicates student that I mentored significantly

PEER-REVIEWED JOURNAL PUBLICATIONS

- Lu, M.**, **Gayah, V.V.** and Guler, S.I. (2023) Impacts of shared bikes on traffic safety: A macroscopic analysis. *Transportation Research Record: Journal of the Transportation Research Board*, in press.
- Taglieri, D.*, Liu, H.* and **Gayah, V.V.** (2023) Network-wide implementation of roundabouts vs. signalized intersections on urban streets: Analytical and simulation comparison. *Transportation Research Record: Journal of the Transportation Research Board*, in press.
- Xu, G.* and **Gayah, V.V.** (2023) Non-unimodal and non-concave relationships in the network Macroscopic Fundamental Diagram caused by hierarchical streets. *Transportation Research Part B: Methodological*, in press.
- Liu, H.*, Devunuri, S.**, Lehe, L. and **Gayah, V.V.** (2023) Scale effects in ridesplitting: A case study of the city of Chicago. *Transportation Research Part A: Policy and Practice*, in press.
- Mahmud, A.*, Hamilton, I., **Gayah, V.V.** and Porter, R.J. (2023) Estimation of VMT using heteroskedastic log-linear regression models. *Transportation Letters*, in press.
- Runa, F.*, Guler, S.I. and **Gayah, V.V.** (2023) Do existing split failure metrics accurately reflect pedestrian operation at signalized intersections? *International Journal of Transportation Science and Technology*, in press.
- Mahmud, A.*, **Gayah, V.V.** and Paleti, R. (2023) Estimation of crash type frequency accounting for misclassification in crash data. *Accident Analysis and Prevention*, in press.
- Lu, M.**, Guler, S.I. and **Gayah, V.V.** (2023) Multi-objective optimization of maintenance, rehabilitation and reconstruction decision making considering safety. *Transportation Research Record: Journal of the Transportation Research Board*, in press.

9. Mahmud, A.* , Sengupta, A.** and **Gayah, V.V.** (2023) Crash classification based on manner of collision: A comparative analysis. *Transportation Letters*, in press.
10. Zhou, D.* and **Gayah, V.V.** (2023) Scalable multi-region perimeter metering control for urban networks: A multi-agent deep reinforcement learning approach. *Transportation Research Part C: Emerging Technologies*, in press.
11. Zhou, D.* and **Gayah, V.V.** (2023) Improving Deep Reinforcement Learning-Based Perimeter Metering Control Methods with Domain Control Knowledge. *Transportation Research Record: Journal of the Transportation Research Board*, in press.
12. Xu, G.* , Zhang, P.* , **Gayah, V.V.** and Hu, X. (2023) Opposing hysteresis patterns in flow and outflow macroscopic fundamental diagrams and their implications. *Transportation Research Record: Journal of the Transportation Research Board*, 2677(8):100-117.
13. Ahmad, N.* , **Gayah, V.V.** and Donnell, E.T. (2023) Copula-based bivariate count data regression models for simultaneous estimation of crash counts based on severity and number of vehicles. *Accident Analysis and Prevention*, 181(106928):1-10.
14. Liu, H.* and **Gayah, V.V.** (2023) Total-delay-based Max Pressure: A max pressure algorithm considering delay equity. *Transportation Research Record: Journal of the Transportation Research Board*, in press.
15. Bayrak, M.** , Yu, Z.* and **Gayah, V.V.** (2023) A population-based incremental learning algorithm to identify optimal location of left-turn restrictions in urban grid networks. *Transportmetrica B: Transport Dynamics*, 11(1):528-547.
16. Liang, X.* , Guler, S.I. and **Gayah, V.V.** (2023) Decentralized arterial traffic signal optimization with Connected Vehicle information. *Journal of Intelligent Transportation Systems*, 27(2):145-160.
17. Wood, J.S.** , Yu, Z.* and **Gayah, V.V.** (2023) Development and evaluation of frameworks for real-time bus passenger occupancy prediction. *International Journal of Transportation Science and Technology*, 12(2):399-413.
18. Zhou, D.* , Wood, J.S.** and **Gayah, V.V.** (2022) Integration of machine learning and statistical models for crash frequency. *Transportation Letters*, in press.
19. Liu, H.* and **Gayah, V.V.** (2022) A novel max pressure algorithm based on traffic delay. *Transportation Research Part C: Emerging Technologies*, 143(103803):1-19.
20. Mahmud, A.* , **Gayah, V.V.** and Paleti, R. (2022) A latent choice model to analyze the role of preliminary preferences in shaping observed choices. *Transportation Research Part B: Methodological*, 161:95-108.
21. Yu, Z.* and **Gayah, V.V.** (2022) Simulation analysis of urban network performance under link disruptions: Impacts of information provisions in different street configurations. *Journal of Intelligent Transportation Systems*, in press.
22. Hamilton, I., Kersavage, K.** , Porter, R.J., **Gayah, V.V.**, Sanchez, J., Smith, K. Tan, C. and Eigen, A.M. (2022) Application of emerging data sources for pedestrian safety analysis in Charlotte, NC. *Transportation Research Record: Journal of the Transportation Research Board*, in press. [**Winner of ACS20 Best Paper Award**]
23. Yocum, R.L.* and **Gayah, V.V.** (2022) County-level crash prediction models for Pennsylvania accounting for income characteristics. *Transportation Research Interdisciplinary Perspectives*, 13(100562):1-14
24. Himes, S., Bonneson, J., **Gayah, V.V.** and Liu, C. (2022) Safety prediction method for freeway facilities with High Occupancy lanes. *Transportation Research Record: Journal of the Transportation Research Board*, 2676(8):501-513.
25. Eluru, N. and **Gayah, V.V.** (2022) A note on estimating Safety Performance Functions with a flexible specification of traffic volume. *Accident Analysis and Prevention*, 167(106571):1-5.
26. Yu, Z.* , Xu, G.* , **Gayah, V.V.** and Christofa, E. (2022) Incorporating phase rotation into a person-based signal timing optimization algorithm. *IEEE Transactions on Intelligent Transportation Systems*, 23(1):513-521.
27. Guadamuz, R.** , Tang, H.** , Yu, Z.* , Guler, S.I. and **Gayah, V.V.** (2022) Green time usage metrics on signalized intersections and arterials using high-resolution traffic data. *International Journal of Transportation Science and Technology*, 11(3):509-521.
28. Mahmud, A.* and **Gayah, V.V.** (2021) Estimation of crash type frequencies on individual collector roadway segments. *Accident Analysis and Prevention*, 161(106345):1-12.

29. Sengupta, A.** , **Gayah, V.V.** and Donnell, E.T. (2021) Examining the impacts of crash data aggregation on SPF estimation. *Accident Analysis and Prevention*, 160(106313):1-15.
30. Lehe, L., **Gayah, V.V.** and Pandey, A.** (2021) Increasing returns to scale in carpool matching: Evidence from Scoop. *Transport Findings*, June.
31. Yocum, R.L.* and **Gayah, V.V.** (2021) Coordinated perimeter flow and variable speed limit control for mixed freeway and urban networks. *Transportation Research Record: Journal of the Transportation Research Board*, 2676(1):596-609.
32. **Gayah, V.V.** and Donnell, E.T. (2021) Estimating safety performance functions for two-lane rural roads using an alternative functional form for traffic volume. *Accident Analysis and Prevention*, 157(106173):1-9.
33. Wang, X.* and **Gayah, V.V.** (2021) Cordon-based pricing schemes for mixed urban-freeway networks using Macroscopic Fundamental Diagrams. *Transportation Research Record: Journal of the Transportation Research Board*, 2675(10):1339-1351.
34. Bayrak, M.** and **Gayah, V.V.** (2021) Identification of optimal left-turn restriction locations using heuristic methods. *Transportation Research Record: Journal of the Transportation Research Board*, 2675(10):452-467.
35. Zhou, D.* and **Gayah, V.V.** (2021) Model-free perimeter metering control for two-region urban networks using deep reinforcement learning. *Transportation Research Part C: Emerging Technologies*, 124(102949):1-24.
36. Wei, H.** , Zheng, G.** , **Gayah, V.V.** and Li, Z. (2020) Recent advances in reinforcement learning for traffic signal control: A survey of models and evaluation. *SIGKDD Explorations*, 22(2):1-7.
37. Tang, H.** , **Gayah, V.V.** and Donnell, E.T. (2020) Crash Modification Factors for adaptive traffic signal control: An Empirical Bayes before-after study. *Accident Analysis and Prevention*, 144:105672.
38. Liang, X.* , Guler, S.I. and **Gayah, V.V.** (2020) Traffic signal control optimization in a Connected Vehicle environment considering pedestrians. *Transportation Research Record: Journal of the Transportation Research Board*, 2674(10):499-511.
39. Xu, G.* , Yu, Z.* and **Gayah, V.V.** (2020) Analytical approximations for macroscopic fundamental diagrams with turning traffic. *Transportation Research Record: Journal of the Transportation Research Board*, 2674(9):933-947.
40. Yu, Z.* and **Gayah, V.V.** (2020) Resilience of urban street network configurations under low demands. *Transportation Research Record: Journal of the Transportation Research Board*, 2674(9):982-994.
41. Guadamuz, R.** , **Gayah, V.V.** and Paleti, R. (2020) Impact of bus routes on crash frequency in metropolitan areas. *Transportation Research Record: Journal of the Transportation Research Board*, 2674(3):305-316.
42. Himes, S.C., **Gayah, V.V.**, Gooch, J.P.* , and Read, S. (2020) Estimating baseline numbers for safety measure target settings in Virginia. *Transportation Research Record: Journal of the Transportation Research Board*, 2674(8):523-535.
43. Liang, X.* , Guler, S.I. and **Gayah, V.V.** (2020) A heuristic method to optimize generic signal phasing and timing plans at signalized intersections using Connected Vehicle technology. *Transportation Research Part C: Emerging Technologies*, 111:156-170.
44. Liang, X.* , Guler, S.I. and **Gayah, V.V.** (2020) An equitable traffic signal control scheme at isolated signalized intersections using Connected Vehicle technology. *Transportation Research Part C: Emerging Technologies*, 110:81-97.
45. Tang, H.** , **Gayah, V.V.** and Donnell, E.T. (2019) Evaluating the predictive power of an SPF for two-lane rural roads with random parameters on out-of-sample observations. *Accident Analysis and Prevention*, 132:105275.
46. Keyvan-Ekbatani, M., Gao, X.* , **Gayah, V.V.** and Knoop, V.L. (2019) Traffic-responsive signals combined with perimeter control: Investigating the benefits. *Transportmetrica B: Transport Dynamics*, 7(1):1402-1425.
47. Liang, X.* , Guler, S.I. and **Gayah, V.V.** (2019) Joint optimization of signal phasing and timing and vehicle speed guidance in a connected and autonomous vehicle environment. *Transportation Research Record: Journal of the Transportation Research Board*, 2673(4):70-83.
48. Kouhi, R.** and **Gayah, V.V.** (2019) Identification of spatiotemporal relationships in travel speeds along individual roadways using probe vehicle data. *Transportation Research Record: Journal of the Transportation Research Board*, 2673(11):546-560.
49. Ortigosa, J.** , **Gayah, V.V.** and Menendez, M. (2019) Analysis of one-way and two-way street configurations on urban grids. *Transportmetrica B: Transport Dynamics*, 7(1):61-81.

50. Gao, X.* and **Gayah, V.V.** (2018) An analytical framework to model uncertainty in urban network dynamics using Macroscopic Fundamental Diagrams. *Transportation Research Part B: Methodological*, 117B:660-675.
51. Hitchcock, O.* and **Gayah, V.V.** (2018) Methods to reduce dimensionality and identify candidate solutions in multi-objective signal timing problems. *Transportation Research Part C: Emerging Technologies*, 96:398-414
52. **Gayah, V.V.**, Donnell, E.T., Yu, Z.* and Li, L.** (2018) Safety and operational impacts of setting speed limits below engineering recommendations. *Accident Analysis and Prevention*, 121:43-52.
53. Alsalhi, R.**, Dixit, V.V. and **Gayah, V.V.** (2018) On the existence of network Macroscopic Safety Diagrams: Theory, simulation and empirical evidence. *PLOS ONE*, 13(8): e0200541.
54. Gooch, J.P.*, **Gayah, V.V.** and Donnell, E.T. (2018) Comparison of safety performance functions for horizontal curves and tangents on two lane, two way rural roads. *Accident Analysis and Prevention*, 120:28-37.
55. Liang, X.*, Guler, S.I. and **Gayah, V.V.** (2018) Signal timing optimization with Connected Vehicle technology: Platooning to improve computational efficiency. *Transportation Research Record: Journal of the Transportation Research Board*, 2672(18):81-92.
56. Li, L.**, **Gayah, V.V.** and Donnell, E.T. (2017) Development of regionalized SPFs for two-lane rural roads in Pennsylvania. *Accident Analysis and Prevention*, 108:343-353.
57. **Gayah, V.V.** and Madanat, S. (2017) Accounting for endogeneity in maintenance decisions and overlay thickness in a pavement roughness deterioration model. *ASCE Journal of Infrastructure Systems*, 23(4):1-7.
58. Gan, Q.**, Jin, W.-L. and **Gayah, V.V.** (2017) Analysis of traffic statics and dynamics in a signalized double-ring network: A Poincare map approach. *Transportation Science*, 51(3):1009-1029.
59. Harmony, X.* and **Gayah, V.V.** (2017) Evaluation of real-time transit information systems: An information demand and supply approach. *International Journal of Transportation Science and Technology*, 6(1):86-98.
60. Yu, Z.*, **Gayah, V.V.** and Christofa, E. (2017) Person-based signal timing optimization to account for flexible cycle lengths and uncertain transit vehicle arrivals. *Transportation Research Record: Journal of the Transportation Research Board*, 2620:31-42.
61. DePrator, A.J.*, Hitchcock, O.* and **Gayah, V.V.** (2017) Improving urban street network efficiency by prohibiting left turns at signalized intersections. *Transportation Research Record: Journal of the Transportation Research Board*, 2622:58-69. [**Winner of D. Grant Mickle Outstanding Paper Award for TRB Operations and Maintenance Area**]
62. Wu, K.**, Guler, S.I. and **Gayah, V.V.** (2017) Estimating the impacts of bus stops and transit signal priority on intersection operations: Queuing and variational theory approach. *Transportation Research Record: Journal of the Transportation Research Board*, 2622:70-83. [**Winner of Fred Burggraf Outstanding Paper Award for TRB Operations and Preservations Group**]
63. Chavis, C. and **Gayah, V.V.** (2017) Development of a mode choice model for general purpose flexible route transit options. *Transportation Research Record: Journal of the Transportation Research Board*, 2650:133-141.
64. Shaaban, K., Wood, J.S.** and **Gayah, V.V.** (2017) Investigating driver behavior at two-way stop sign intersections in Qatar. *Transportation Research Record: Journal of the Transportation Research Board*, 2663:109-116.
65. Yu, Z.*, Wood, J.S.** and **Gayah, V.V.** (2017) Using survival models to estimate bus travel times and associated uncertainties. *Transportation Research Part C: Emerging Technologies*, 74:366-382.
66. Stieffenhofer, K.E.*, Barton, M.*, **Gayah, V.V.** (2016) Assessing park-and-ride efficiency and user reactions to parking management strategies. *Journal of Public Transportation*, 19(4):75-92.
67. Gooch, J.P.*, **Gayah, V.V.** and Donnell, E.T. (2016) Quantifying the safety effects of horizontal curves on two-way, two-lane rural roads. *Accident Analysis and Prevention*, 92:71-81.
68. Girault, J.-T.*, **Gayah, V.V.**, Guler, S.I. and Menendez, M. (2016) An exploratory analysis of signal coordination impacts on the Macroscopic Fundamental Diagram. *Transportation Research Record: Journal of the Transportation Research Board*, 2560:36-46.
69. Guler, S.I., **Gayah, V.V.** and Menendez, M. (2016) Bus priority at signalized intersections with single-lane approaches: A novel pre-signal strategy. *Transportation Research Part C: Emerging Technologies*, 63:51-70.
70. Du, J., Rakha, H. and **Gayah, V.V.** (2016) Deriving Macroscopic Fundamental Diagrams from probe data: Issues and solutions. *Transportation Research Part C: Emerging Technologies*, 66:136-149.

71. **Gayah, V.V.**, Guler, S.I. and Gu, W. (2016) On the impact of obstructions on the capacity of nearby signalized intersections. *Transportmetrica B: Transport Dynamics*, 4(1):48-67.
72. Han, K.**, Liu, H., **Gayah, V.V.**, Friesz, T.L. and Yao, T. (2016) A robust optimization approach for dynamic traffic signal control with emissions constraints. *Transportation Research Part C: Emerging Technologies*, 70:3-26.
73. Han, K.** and **Gayah, V.V.** (2015) Continuum signalized junction model for dynamic traffic networks: Offset, spillback, and multiple stages. *Transportation Research Part B: Methodological*, 77:213-239.
74. Liu, H., Han, K.**, **Gayah, V.V.**, Friesz, T. and Yao, T. (2015) Data-driven linear decision rule approach for distributionally robust optimization of on-line signal control. *Transportation Research Part C: Emerging Technologies*, 59:260-277.
75. Jerath, K.**, Ray, A., Brennan, S. N., and **Gayah, V.V.** (2015) Dynamic prediction of vehicle cluster distribution in mixed traffic: A statistical mechanics-inspired method. *IEEE Transactions on Intelligent Transportation Systems*, 16(5):2424-2434.
76. Muhlich, N.*, **Gayah, V.V.** and Menendez, M. (2015) Use of microsimulation for examination of Macroscopic Fundamental Diagram hysteresis patterns on hierarchical street networks. *Transportation Research Record: Journal of the Transportation Research Board*, 2491:117-126.
77. Ortigosa, J.**, Menendez, M., and **Gayah, V.V.** (2015) Analysis of the Network Exit Functions for various urban grid network configurations. *Transportation Research Record: Journal of the Transportation Research Board*, 2491:12-21.
78. Tsubota, T., Bhaskar, A., Nantes, A., Chung, E., and **Gayah, V.V.** (2015) Comparative analysis of traffic state estimation: Cumulative counts-based and trajectory-based methods. *Transportation Research Record: Journal of the Transportation Research Board*, 2491:43-52.
79. Bopp, M., **Gayah, V.V.** and Campbell, M.E. (2015) Examining the link between public transit use and active commuting. *International Journal of Environmental Research and Public Health*, 12(4):4256-4274.
80. **Gayah, V.V.**, Gao, X.* and Nagle, A.S.* (2014) On the impacts of locally adaptive signal control on urban network stability and the Macroscopic Fundamental Diagram. *Transportation Research Part B: Methodological*, 70:255-268.
81. Gu, W., **Gayah, V.V.**, Cassidy, M.J. and Saade, N. (2014) On the impacts of bus stops near signalized intersections: Models of car and bus delays. *Transportation Research Part B: Methodological*, 68:123-140.
82. Nagle, A.S.* and **Gayah, V.V.** (2014) Accuracy of network-wide traffic states estimated from mobile probe data. *Transportation Research Record: Journal of the Transportation Research Board*, 2421:1-11.
83. Han, K.**, **Gayah, V.V.**, Piccoli, B., Friesz, T. and Yao, T. (2014) On the continuum approximation of the on-and-off signal control on dynamic traffic networks. *Transportation Research Part B: Methodological*, 61:73-97.
84. **Gayah, V.V.**, Dixit, V.V. and Guler, S.I. (2014) Relationship between mean and day-to-day variation in travel time in urban networks. *EURO Journal on Transportation and Logistics*, 3(3):227-243.
85. **Gayah, V.V.** and Dixit, V.V. (2013) Using mobile probe data and the Macroscopic Fundamental Diagram to estimate network densities: Tests using microsimulation. *Transportation Research Record: Journal of the Transportation Research Board*, 2390:76-86.
86. Doig, J.C.**, **Gayah, V.V.** and Cassidy, M.J. (2013) Inhomogeneous flow patterns in undersaturated road networks: Implications for Macroscopic Fundamental Diagram. *Transportation Research Record: Journal of the Transportation Research Board*, 2390:68-75. [Winner of Cunard Outstanding Paper Award for TRB Operations and Maintenance Area]
87. Jin, W.-L., Gan, Q.** and **Gayah, V.V.** (2013) A kinematic wave approach to traffic statics and dynamics in a double-ring network. *Transportation Research Part B: Methodological*, 57:114-131.
88. Gu, W., Cassidy, M.J., **Gayah, V.V.** and Ouyang, Y. (2013) Mitigating impacts of near-side bus stops on cars. *Transportation Research Part B: Methodological*, 47:42-56.
89. **Gayah, V.V.** and Daganzo, C.F. (2012) Analytical capacity comparison of one-way and two-way signalized street networks. *Transportation Research Record: Journal of the Transportation Research Board*, 2301:76-85.
90. Xuan, Y., **Gayah, V.V.**, Cassidy, M.J. and Daganzo, C.F. (2012) Pre-signal used to increase bus- and car-carrying capacity at intersections: Theory and experiment. *Transportation Research Record: Journal of the Transportation Research Board*, 2315:191-196.

91. Daganzo, C.F., **Gayah, V.V.** and Gonzales, E.J. (2012) The potential of parsimonious models for understanding large scale transportation systems and answering big-picture questions. *EURO Journal on Transportation and Logistics*, 1(1-2):47-65.
92. Dixit, V.V., **Gayah, V.V.** and Radwan, E. (2012) Comparison of driver behavior by time of day and wet pavement conditions. *ASCE Journal of Transportation Engineering*, 138(8):1023-1029.
93. **Gayah, V.V.** and Daganzo, C.F. (2011) Effects of turning maneuvers and route choice on a simple network. *Transportation Research Record: Journal of the Transportation Research Board*, 2249:15-19.
94. **Gayah, V.V.** and Daganzo, C.F. (2011) Clockwise hysteresis loops in the Macroscopic Fundamental Diagram: An effect of network instability. *Transportation Research Part B: Methodological*, 45(4):643-655.
95. Daganzo, C.F., **Gayah, V.V.** and Gonzales, E.J. (2011) Macroscopic relations of urban traffic variables: Bifurcations, multivaluedness and instability. *Transportation Research Part B: Methodological*, 45:278-288.
96. Abdel-Aty, M. and **Gayah, V.V.** (2011) Using traffic micro-simulation to test route diversion as a real-time crash prevention strategy on freeways. *Advances in Transportation Studies*, 23:15-28.
97. Abdel-Aty, M. and **Gayah, V.V.** (2010) Real-time crash risk reduction on freeways using coordinated and uncoordinated ramp metering approaches. *ASCE Journal of Transportation Engineering*, 136(5):410-423.
98. Abdel-Aty, M., Cunningham, R., **Gayah, V.V.** and Hsia, L. (2008) Dynamic variable speed limit strategies for real-time crash risk reduction on freeways. *Transportation Research Record: Journal of the Transportation Research Board*, 2078:108-116.
99. Abdel-Aty, M., Dhindsa, A. and **Gayah, V.V.** (2007) Considering various ALINEA ramp metering strategies for crash risk mitigation on freeways under congested regime. *Transportation Research Part C: Emerging Technologies*, 15(2):113-134.
100. Abdel-Aty, M., Pande, A., Lee, C., **Gayah, V.V.** and Dos Santos, C. (2007) Crash risk assessment using intelligent transportation systems data and real-time intervention strategies to improve freeway safety. *Journal of Intelligent Transportation Systems*, 11(3):107-120.

PEER-REVIEWED CONFERENCE PROCEEDINGS

1. Liu, H.* and **Gayah, V.V.** (2023) TD-MP: A max pressure algorithm considering delay equity. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
2. Liu, H., Xiong, Z.* and **Gayah, V.V.** (2023) Quantifying the impacts of right-turn-on-red, exclusive turn lanes and pedestrian movements on the efficiency of urban transportation networks. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
3. Ahmad, N., **Gayah, V.V.** and Donnell, E.T. (2023) Copula-based bivariate count data regression models for simultaneous estimation of crash counts based on severity and number of vehicles. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
4. Mahmud, A., Sengupta, A. and **Gayah, V.V.** (2023) Crash classification based on manner of collision: A comparative analysis. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
5. Xu, G.*, Zhang, P.*, **Gayah, V.V.** and Hu, X. (2023) Opposing hysteresis patterns in flow and outflow macroscopic fundamental diagrams and their implications. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
6. Zhou, D.* and **Gayah, V.V.** (2023) A scalable model-free deep reinforcement learning-based perimeter metering control method for multi-region urban networks. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
7. Blackburn, L., Hamilton, I., **Gayah, V.V.**, Guler, S.I., Carter, D., Mayhew, B.K., Seymour, J. and Liu, H.* (2023) Bottom up or top down: Comparing pedestrian exposure estimates using city and statewide exposure models. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
8. Liu, H.*, Devunuri, S., Lehe, L. and **Gayah, V.V.** (2023) Scale effects in ridesplitting: A case study of the city of Chicago. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]

9. Ahmad, N.*, Bhowmik, T., **Gayah, V.V.** and Eluru, N. (2023) Rigorous simulation-based statistical analysis to compare fixed and random parameter count data models: Examining the contribution of independent variables vis-à-vis random parameters. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
10. Lu, M.**, Guler, S.I. and **Gayah, V.V.** (2023) Multi-objective optimization of maintenance, rehabilitation and reconstruction decision making considering safety. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
11. Mahmud, A.*, Hamilton, I., **Gayah, V.V.** and Porter, R.J. (2023) Estimation of VMT using heteroskedastic log-linear regression models. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
12. Lyu, L.*, Zhou, D.*, Liu, H.*, **Gayah, V.V.** and Guler, S.I. (2023) Adaptive action selection strategy of reinforcement learning approach for intelligent traffic light control. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
13. Pandey, A.**, Lehe, L. and **Gayah, V.V.** (2023) Equilibrium stability for multi-modal traffic in an urban zone. *102nd Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, D.C. [abstract available in conference proceedings]
14. Pandey, A.**, Lehe, L. and **Gayah, V.V.** (2022) Stability analysis of multimodal traffic in an urban zone. *International Transportation Economics Association Annual Conference*, 13-15 June, Toulouse, France.
15. Hamilton, I., Kersavage, K.**, Porter, R.J., **Gayah, V.V.**, Sanchez, J., Smith, K. Tan, C. and Eigen, A.M. (2022) Application of emerging data sources for pedestrian safety analysis in Charlotte, NC. *101st Annual Meeting of the Transportation Research Board*, 9-13 January, Washington, D.C. [abstract available in conference proceedings]
16. Lu, M.**, **Gayah, V.V.** and Guler, S.I. (2022) Analysis of shared bike and other exposure measures in a macroscopic crash frequency model. *101st Annual Meeting of the Transportation Research Board*, 9-13 January, Washington, D.C. [abstract available in conference proceedings]
17. Himes, S., Bonneson, J., **Gayah, V.V.** and Liu, C. (2022) Safety prediction method for freeway facilities with High Occupancy lanes. *101st Annual Meeting of the Transportation Research Board*, 9-13 January, Washington, D.C. [abstract available in conference proceedings]
18. Mahmud, A.* and **Gayah, V.V.** (2022) Estimation of crash type frequencies on individual collector roadway segments. *101st Annual Meeting of the Transportation Research Board*, 9-13 January, Washington, D.C. [abstract available in conference proceedings]
19. Xu, G.* and **Gayah, V.V.** (2022) Non-unimodal and non-concave relationships in the network Macroscopic Fundamental Diagram caused by hierarchical streets. *101st Annual Meeting of the Transportation Research Board*, 9-13 January, Washington, D.C. [abstract available in conference proceedings]
20. Wang, X.*, **Gayah, V.V.** and Guler, S.I. (2022) Integration of pavement roughness into safety performance. *101st Annual Meeting of the Transportation Research Board*, 9-13 January, Washington, D.C. [abstract available in conference proceedings]
21. Zhou, D.* and **Gayah, V.V.** (2022) Integration of human guidance into a reinforcement learning-based perimeter metering control method for urban traffic networks. *101st Annual Meeting of the Transportation Research Board*, 9-13 January, Washington, D.C. [abstract available in conference proceedings]
22. Yocum, R.L.* and **Gayah, V.V.** (2022) Investigating the inclusion of traffic operations concepts in undergraduate civil engineering curricula. *101st Annual Meeting of the Transportation Research Board*, 9-13 January, Washington, D.C. [abstract available in conference proceedings]
23. Mahmud, A.*, **Gayah, V.V.** and Paleti, R. (2022) A latent choice model to analyze the role of preliminary preferences in shaping observed choices. *101st Annual Meeting of the Transportation Research Board*, 9-13 January, Washington, D.C. [abstract available in conference proceedings]
24. Xu, G.* and **Gayah, V.V.** (2021) On the impacts of roadway hierarchy on the network Macroscopic Fundamental Diagram. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
25. Yocum, R.L.* and **Gayah, V.V.** (2021) Coordinated perimeter flow and variable speed limit control for mixed freeway and urban networks. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]

26. Zhou, D.* and **Gayah, V.V.** (2021) Model free perimeter metering control for urban networks using deep reinforcement learning. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
27. Yocum, R.L.* and **Gayah, V.V.** (2021) Identifying relationships between socioeconomic indicators and crash frequency in Pennsylvania. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
28. Bayrak, M.** and **Gayah, V.V.** (2021) Identification of optimal left-turn restriction locations using heuristic methods. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
29. Wang, X.* and **Gayah, V.V.** (2021) Departure time choice and tolls for a high-occupancy toll lane system with heterogeneity in arrival time. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
30. Liang, X.*, Guler, S.I. and **Gayah, V.V.** (2021) Decentralized arterial traffic signal optimization with Connected Vehicle information. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
31. Paleti, R., Mahmud, A.*, **Gayah, V.V.**, and Pinjari, A. (2021) When and where does the next crash occur? A discretized duration based modeling approach. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
32. Tang, H.**, **Gayah, V.V.** and Donnell, E.T. (2021) Crash Modification Factors for adaptive traffic signal control: An Empirical-Bayes before-after study. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
33. Guadamuz, R.**, Guler, S.I. and **Gayah, V.V.** (2021) Green time usage metrics on signalized intersections and arterials using high-resolution traffic data. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
34. **Gayah, V.V.**, Zappe, S.R. and Cutler, S.E. (2020) Personalized learning plans for prerequisite materials in a senior-level traffic engineering course. *2020 ASEE Annual Conference and Exposition*, 22-26 June, moved to a virtual conference due to COVID.
35. Liang, X.*, Guler, S.I. and **Gayah, V.V.** (2020) Traffic signal control optimization in a Connected Vehicle environment considering pedestrians. *99th Annual Meeting of the Transportation Research Board*, 12-16 January, Washington, D.C. [abstract available in conference proceedings]
36. Xu, G.*, Yu, Z.* and **Gayah, V.V.** (2020) Analytical approximations for macroscopic fundamental diagrams with turning traffic. *99th Annual Meeting of the Transportation Research Board*, 12-16 January, Washington, D.C. [abstract available in conference proceedings]
37. Yocum, R.* and **Gayah, V.V.** (2020) Determining the effect of wealth on crash frequency in Pennsylvania. *99th Annual Meeting of the Transportation Research Board*, 12-16 January, Washington, D.C. [abstract available in conference proceedings]
38. Bayrak, M.**, Yu, Z.* and **Gayah, V.V.** (2020) Optimal spatial configuration of left-turn restrictions on urban grid networks using enumeration and Population-Based Incremental Learning. *99th Annual Meeting of the Transportation Research Board*, 12-16 January, Washington, D.C. [abstract available in conference proceedings]
39. Yu, Z.* and **Gayah, V.V.** (2020) Resilience of urban street network configurations under low demands. *99th Annual Meeting of the Transportation Research Board*, 12-16 January, Washington, D.C. [abstract available in conference proceedings]
40. **Gayah, V.V.** and Donnell, E.T. (2020) Estimating Safety Performance Functions for two-lane rural roads using and alternative functional form for traffic volumes. *99th Annual Meeting of the Transportation Research Board*, 12-16 January, Washington, D.C. [abstract available in conference proceedings]
41. Guadamuz, R.**, **Gayah, V.V.** and Paleti, R. (2020) Impact of bus routes on crash frequency in metropolitan areas. *99th Annual Meeting of the Transportation Research Board*, 12-16 January, Washington, D.C. [abstract available in conference proceedings]
42. Himes, S.C., **Gayah, V.V.**, Gooch, J.P.*, and Read, S. (2020) Estimating baseline numbers for safety measure target settings in Virginia. *99th Annual Meeting of the Transportation Research Board*, 12-16 January, Washington, D.C. [abstract available in conference proceedings]

43. Tang, H.** , **Gayah, V.V.** and Donnell, E.T. (2019) Evaluating the predictive power of a safety performance function for two-lane rural roads with random parameters. *2019 Road Safety and Simulation International Conference*, 14-17 October, Iowa City, Iowa.
44. Wei, H.** , Chen, C., Zheng, G.** , Wu, K.** , **Gayah, V.V.**, Wu, K. and Li, Z. (2019) PressLight: Learning Max Pressure Control for Signalized Intersections in Arterial Network. *25th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD 2019)*, 4-8 August, Anchorage, Alaska. [14% acceptance rate]
45. Wei, H.** , Chen, C. , Wu, K.** , Zheng, G.** , Yu, Z., **Gayah, V.V.**, and Li, Z. (2019) Deep Reinforcement Learning for Traffic Signal Control along Arterials. *International Conference on Knowledge Discovery and Data Mining (KDD 2019): Workshop on Deep Reinforcement Learning for Knowledge Discovery*, 4-8 August, Anchorage, Alaska.
46. Liang, X.* , Guler, S.I. and **Gayah, V.V.** (2019) A heuristic method to optimize generic signal phasing and timing plans at signalized intersections using Connected Vehicle technology. *98th Annual Meeting of the Transportation Research Board*, 13-17 January, Washington, D.C.
47. Liang, X.* , Guler, S.I. and **Gayah, V.V.** (2019) Joint optimization of signal phasing and timing and vehicle speed guidance in a connected and autonomous vehicle environment. *98th Annual Meeting of the Transportation Research Board*, 13-17 January, Washington, D.C.
48. Kouhi, R.** and **Gayah, V.V.** (2019) Identification of spatiotemporal relationships in travel speeds along individual roadways using probe vehicle data. *98th Annual Meeting of the Transportation Research Board*, 13-17 January, Washington, D.C.
49. Yu, Z.* and **Gayah, V.V.** (2019) Network performance under link disruptions: A comparison of two-way and one-way network configurations. *98th Annual Meeting of the Transportation Research Board*, 13-17 January, Washington, D.C.
50. Alsalhi, R.** , Dixit, V.V. and **Gayah, V.V.** (2019) On the existence of network macroscopic safety diagrams to describe traffic conflicts. *98th Annual Meeting of the Transportation Research Board*, 13-17 January, Washington, D.C.
51. Zhou, X., Pietrucha, M.T., **Gayah, V.V.** and Donnell, E.T. (2019) Evaluating drivers' stop-line violation behavior at signalized intersections. *98th Annual Meeting of the Transportation Research Board*, 13-17 January, Washington, D.C.
52. Yu, Z.* , **Gayah, V.V.** and Christofa, E. (2018) Implementing phase rotation in a person-based signal timing optimization. *21st Annual IEEE Conference on Intelligent Transportation Systems*, 4-7 November, Maui, Hawaii.
53. Liang, X.* , Guler, S.I. and **Gayah, V.V.** (2018) A scalable and computationally efficient Connected Vehicle-based signal control algorithm. *21st Annual IEEE Conference on Intelligent Transportation Systems*, 4-7 November, Maui, Hawaii.
54. Yu, Z.* and **Gayah, V.V.** (2018) Comparison of urban street network resilience for grid networks with and without left-turning maneuvers under light traffic situation. *97th Annual Meeting of the Transportation Research Board*, 7-11 January, Washington, D.C.
55. Gooch, J.P.* , **Gayah, V.V.** and Donnell, E.T. (2018) Safety performance estimation of horizontal curves on two lane, two way rural roads. *97th Annual Meeting of the Transportation Research Board*, 7-11 January, Washington, D.C.
56. Liang, X.* , Guler, S.I. and **Gayah, V.V.** (2018) Signal timing optimization with Connected Vehicle technology: Platooning to improve computational efficiency. *97th Annual Meeting of the Transportation Research Board*, 7-11 January, Washington, D.C.
57. Hitchcock, O.* and **Gayah, V.V.** (2018) Methods to identify candidate solutions in multi-objective signal timing optimization. *97th Annual Meeting of the Transportation Research Board*, 7-11 January, Washington, D.C.
58. Yu, Z.* , **Gayah, V.V.** and Christofa, E. (2018) Person-based signal timing optimization with flexible cycle lengths and phase rotation. *97th Annual Meeting of the Transportation Research Board*, 7-11 January, Washington, D.C.
59. **Gayah, V.V.** and Donnell, E.T. (2017) Safety and operational impacts of setting speed limits below engineering recommendations. *2017 Road Safety and Simulation International Conference*, 17-19 October, The Hague, Netherlands.

60. Gao, X.* and **Gayah, V.V.** (2017) An analytical framework to model uncertainty in urban network dynamics using Macroscopic Fundamental Diagrams. *22nd International Symposium on Transportation and Traffic Theory*, 24-26 July, Evanston, Illinois.
61. Yu, Z.*, **Gayah, V.V.** and Christofa, E. (2017) Person-based signal timing optimization to account for flexible cycle lengths and uncertain transit vehicle arrivals. *96th Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, DC.
62. DePrator, A.J.*, Hitchcock, O.* and **Gayah, V.V.** (2017) Improving street network efficiency by prohibiting left turns at signalized intersections. *96th Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, DC.
63. Harmony, X.* and **Gayah, V.V.** (2017) Implementing real-time transit information systems: An examination of information supply and demand. *96th Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, DC.
64. Wu, K.**, Guler, S.I. and **Gayah, V.V.** (2017) A queuing and variational theory approach to estimating the impacts of bus stops on transit signal priority. *96th Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, DC.
65. Chavis, C. and **Gayah, V.V.** (2017) Development of a mode choice model for general purpose flexible route transit options. *96th Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, DC.
66. Shaaban, K., Wood, J.S.** and **Gayah, V.V.** (2017) Investigating driver behavior at two-way stop sign intersections in Qatar. *96th Annual Meeting of the Transportation Research Board*, 8-12 January, Washington, DC.
67. Gooch, J.P.* and **Gayah, V.V.** (2016) On the design of linear transit systems with park and rides: Analysis of an idealized scenario. *95th Annual Meeting of the Transportation Research Board*, 10-14 January, Washington, DC.
68. Stieffenhofer, K. *, Barton, M. * and **Gayah, V.V.** (2016) Assessing park-and-ride use and user reactions to parking management strategies: A case study in Puget Sound, Washington. *95th Annual Meeting of the Transportation Research Board*, 10-14 January, Washington, DC.
69. Yu, Z. *, Wood, J.S.** and **Gayah, V.V.** (2016) Regression models for real-time bus occupancy prediction. *95th Annual Meeting of the Transportation Research Board*, 10-14 January, Washington, DC.
70. Yu, Z. *, Wood, J.S.** and **Gayah, V.V.** (2016) Modeling bus travel times and travel time uncertainty: Comparison of linear and survival model frameworks. *95th Annual Meeting of the Transportation Research Board*, 10-14 January, Washington, DC.
71. Girault, J.-T.*, **Gayah, V.V.**, Guler, S.I. and Menendez, M. (2016) An exploratory analysis of signal coordination impacts on the Macroscopic Fundamental Diagram. *95th Annual Meeting of the Transportation Research Board*, 10-14 January, Washington, DC.
72. Keyvan-Ekbatani, M., Gao, X.*, **Gayah, V.V.** and Knoop, V.L. (2016) Combination of traffic responsive and gating control in urban networks: Effective interactions. *95th Annual Meeting of the Transportation Research Board*, 10-14 January, Washington, DC.
73. Keyvan-Ekbatani, M., **Gayah, V.V.**, Gao, X.*, and Knoop, V.L. (2016) Examining perimeter gating of urban traffic networks with adaptive traffic signals. *Traffic and Granular Flow 2015*, 28-30 October, Nootdorp, The Netherlands.
74. Gooch, J.P.*, **Gayah, V.V.** and Donnell, E.T. (2015) Estimating the safety effects of horizontal curves on Pennsylvania two-lane rural roads. *2015 Road Safety and Simulation International Conference*, 6-8 October, Orlando, Florida.
75. Guler, S.I., **Gayah, V.V.** and Menendez, M. (2015) Providing bus priority at signalized intersections with single-lane approaches. *21st International Symposium on Transportation and Traffic Theory*, 5-7 August, Kobe, Japan.
76. Liu, H., Han, K.**, **Gayah, V.V.**, Friesz, T. and Yao, T. (2015) Data-driven linear decision rule approach for distributionally robust optimization of on-line signal control. *21st International Symposium on Transportation and Traffic Theory*, 5-7 August, Kobe, Japan.
77. Du, J., Rakha, H. and **Gayah, V.V.** (2015) Design and evaluation of network control strategies using the Macroscopic Fundamental Diagram. *18th Annual IEEE Conference on Intelligent Transportation Systems*, 15-18 September, Canary Islands, Spain.

78. Nagle, A.S.* and **Gayah, V.V.** (2015) Comparing the use of link and probe data to inform perimeter metering control. *94th Annual Meeting of the Transportation Research Board*, 11-15 January, Washington DC.
79. Muhlich, N.*, **Gayah, V.V.** and Menendez, M. (2015) An examination of MFD hysteresis patterns for hierarchical urban street networks using micro-simulation. *94th Annual Meeting of the Transportation Research Board*, 11-15 January, Washington DC.
80. Ortigosa, J.**, Menendez, M. and **Gayah, V.V.** (2015) Analysis of the Network Exit Functions for different urban grid network configurations. *94th Annual Meeting of the Transportation Research Board*, 11-15 January, Washington DC.
81. Tsubota, T., Bhaskar, A., Nantes, A., Chung, E. and **Gayah, V.V.** (2015) Comparative analysis of traffic state estimation: Cumulative counts-based and trajectory-based methods. *94th Annual Meeting of the Transportation Research Board*, 11-15 January, Washington DC.
82. Jerath, K.**, Ray, A., Brennan, S. and **Gayah, V.V.** (2014) Statistical mechanics-inspired framework for studying the effects of mixed flows on highway congestion. *American Control Conference*, 4-6 June, Portland, Oregon. [**Best presentation award**]
83. **Gayah, V.V.** and Gao, X.* (2014) The effect of adaptive green duration control on the Macroscopic Fundamental Diagram. *93rd Annual Meeting of the Transportation Research Board*, 12-16 January, Washington DC.
84. Nagle, A.S.* and **Gayah, V.V.** (2014) The accuracy of network-wide traffic state estimations using mobile probe data. *93rd Annual Meeting of the Transportation Research Board*, 12-16 January, Washington DC.
85. Ortigosa, J.**, **Gayah, V.V.** and Menendez, M. (2014) Comparison of traffic performance in finite grids with different configurations: Analytical versus simulated approach. *93rd Annual Meeting of the Transportation Research Board*, 12-16 January, Washington DC.
86. Han, K.**, Piccoli, B., **Gayah, V.V.**, Friesz, T. and Yao, T. (2014) On the continuum approximation of the on-and-off signal control for dynamic networks. *93rd Annual Meeting of the Transportation Research Board*, 12-16 January, Washington DC.
87. Gan, Q.,** Jin, W.-L. and **Gayah, V.V.** (2014) A link-queue approach to traffic statics and dynamics in signalized networks. *93rd Annual Meeting of the Transportation Research Board*, 12-16 January, Washington DC.
88. Lidicker, J., Argote, J., **Gayah, V.V.** Griswold, J.B., Carnarius, K., Ehrick, T.R. and Sheeran, E. (2014) Shuttle transit system evaluation methodology: Performance, characterization, and optimization. *93rd Annual Meeting of the Transportation Research Board*, 12-16 January, Washington DC.
89. Nagle, A.S.* and **Gayah, V.V.** (2013) A method to estimate the Macroscopic Fundamental Diagram using limited mobile probe data, *16th Annual IEEE Conference on Intelligent Transportation Systems*, 6-9 October, The Hague, Netherlands.
90. **Gayah, V.V.** and Madanat, S.M. (2013) Development of an empirical model of pavement roughness with condition survey data. Selected proceedings of the *13th World Conference on Transport Research*, 15-18 July, Rio de Janeiro, Brazil. [**Best poster award**]
91. **Gayah, V.V.** and Dixt, V.V. (2013) Using mobile probe data and the Macroscopic Fundamental Diagram to estimate network densities: Tests using micro-simulation. *92nd Annual Meeting of the Transportation Research Board*, 13-17 January, Washington DC.
92. **Gayah, V.V.** and Bopp, M.J. (2013) Does a link exist between public transit use and active commuting behavior? *92nd Annual Meeting of the Transportation Research Board*, 13-17 January, Washington DC.
93. Doig, J.C.**, **Gayah, V.V.** and Cassidy, M.J. (2013) Inhomogeneous flow patterns in under-saturated road networks and implications for the MFD. *92nd Annual Meeting of the Transportation Research Board*, 13-17 January, Washington DC.
94. Jin, W.-L., Gan, Q.** and **Gayah, V.V.** (2013) A kinematic wave approach to traffic statics and dynamics in a double-ring network. *92nd Annual Meeting of the Transportation Research Board*, 13-17 January, Washington DC.
95. Gu, W., Cassidy, M.J., **Gayah, V.V.** and Ouyang, Y. (2013) Mitigating negative impacts of near-side bus stops. *92nd Annual Meeting of the Transportation Research Board*, 13-17 January, Washington DC.
96. **Gayah, V.V.** and Daganzo, C.F. (2012) Analytical capacity comparison of one-way and two-way signalized street networks. *91st Annual Meeting of the Transportation Research Board*, 22-26 January, Washington DC.

97. **Gayah, V.V.**, Guler, S.I. and Sivakumaran, K. (2012) Accounting for congestion in network design. *91st Annual Meeting of the Transportation Research Board*, 22-26 January, Washington DC.
98. **Gayah, V.V.** and Daganzo, C.F. (2011) Exploring the effect of turning maneuvers and route choice on a simple network. *90th Annual Meeting of the Transportation Research Board*, 23-27 January, Washington DC.
99. Xuan, Y., **Gayah V.V.**, Daganzo, C.F. and Cassidy, M.J. (2010) Multimodal traffic at isolated intersections: New management strategies to increase capacity. *89th Annual Meeting of the Transportation Research Board*, 11-15 January, Washington DC.
100. Abdel-Aty, M. and **Gayah, V.V.** (2009) Using traffic micro-simulation to test route diversion as a real-time crash prevention strategy on freeways. *International Conference on Road Safety and Simulation 2009*, October, Paris, France.
101. Abdel-Aty, M. and **Gayah, V.V.** (2008) Considering route diversion as a real-time crash prevention strategy on urban freeways, *87th Annual Meeting of the Transportation Research Board*, 13-17 January, Washington DC.
102. Abdel-Aty, M. and **Gayah, V.V.** (2008) Comparison of two different ramp metering algorithms for real-time crash risk reduction. *87th Annual Meeting of the Transportation Research Board*, 13-17 January, Washington DC.
103. Abdel-Aty, M., Cunningham, R., **Gayah, V.V.** and Hsia, L. (2008) Dynamic variable speed limit strategies for real-time crash risk reduction on freeways. *87th Annual Meeting of the Transportation Research Board*, 13-17 January, Washington DC.
104. Abdel-Aty, M. and **Gayah, V.V.** (2007) Crash severity along an urban freeway: Modeling temporal, spatial, and real-time traffic conditions. *11th World Conference on Transport Research*, 24-28 June, Berkeley, California.
105. **Gayah, V.V.**, Dos Santos, C., Abdel-Aty, M., Dhindsa, A. and Dilmore, J. (2006) Evaluating ITS strategies for real-time freeway safety improvement. *9th Annual IEEE Conference on Intelligent Transportation Systems*, 17-20 September, Toronto, Canada.

CONFERENCE PROCEEDINGS REVIEWED BY ABSTRACT

1. Melis, L*, **Gayah, V.V.** and Ranjbari, A. (2023) Delivering efficiency: Joint optimization of parcel locker location and configuration considering vehicle routing and flexible delivery alternatives. *37th Annual Conference of the Belgian Operational Research Society (ORBEL)*, 25-26 May, Liege, Belgium.
2. Taglieri, D.*, Liu, H.* and **Gayah, V.V.** (2023) Network-Wide Implementation of Roundabouts Vs. Signalized Intersections on Urban Streets: Analytical and Simulation Comparison. *ASCE International Conference on Transportation and Development (ICTD)*, 15-17 June, Austin, Texas.
3. Yocum, R.* and **Gayah, V.V.** (2020) Determining the effect of wealth on crash frequency in Pennsylvania. *ASCE International Conference on Transportation and Development (ICTD)*, 26-29 May, Seattle, Washington. (cancelled due to COVID)
4. Bayrak, M.**, Yu, Z.* and **Gayah, V.V.** (2018) Optimal spatial configuration of left-turn restrictions on urban grid networks. *Traffic Flow Theory and Characteristics Committee Mid-Year Meeting*, 7-9 August, Woods Hole, MA.
5. Jerath, K.**, **Gayah, V.V.** and Brennan, S. (2014) Influential subspaces of Connected Vehicles in highway traffic. *Symposium Celebrating 50 Years of Traffic Flow Theory*, 11-13 August, Portland, Oregon.
6. **Gayah, V.V.**, Argote, J. and Daganzo, C.F. (2013) Targeted transit subsidies: A method for increasing transit modal shift. *Kuhmo Nectar Conference on Transportation Economics*, 10-12 July, Chicago, Illinois.
7. Ortigosa, J.**, **Gayah, V.V.** and Menendez, M. (2013) Study of urban grid configurations. *13th Swiss Transport Research Conference*, 24-26 April, Monte-Verita, Switzerland.
8. **Gayah, V.V.** and Dixit, V.V. (2012) Using mobile vehicle probes to estimate network-wide traffic conditions. *LATSIS - 1st European Symposium on Quantitative Methods in Transportation Systems*, 4-7 September, Lausanne, Switzerland.
9. Dixit, V.V., **Gayah, V.V.** and Guler, S.I. (2012) Relationship between mean and variance of travel time in networks. *LATSIS - 1st European Symposium on Quantitative Methods in Transportation Systems*, 4-7 September, Lausanne, Switzerland.
10. Gu, W., Cassidy, M.J., **Gayah, V.V.** and Ouyang, Y. (2012) Strategies for mitigating impacts of near-side bus stops on cars. *12th International Conference on Advanced Systems for Public Transport*, 23-27 July, Santiago, Chile.

11. Argote, J., Xuan, Y. and **Gayah, V.V.** (2012) Comparative analysis of bus control strategies: A case study of the UC Berkeley Bear Transit system. *12th International Conference on Advanced Systems for Public Transport*, 23-27 July, Santiago, Chile.
12. Daganzo, C.F., Gonzales, E.J. and **Gayah, V.V.** (2011) Traffic congestion in networks, and alleviating it with public transportation and pricing. *International Workshop on Urban Transport*, 26-29 October, Beijing, China.
13. Abdel-Aty, M., Haleem, K., Cunningham, R. and **Gayah, V.V.** (2009) Application of variable speed limits and ramp metering to improve safety and efficiency of freeways. *2nd International Symposium on Freeway and Tollway Operations*, June, Honolulu, Hawaii.
14. **Gayah, V.V.**, Abdel-Aty, M. and Pande, A. (2008) Evaluating route diversion as a strategy for reduction of real-time crash risk on freeways using microscopic simulation, *10th International Conference on Applications of Advanced Technologies in Transportation*, May, Athens, Greece.
15. Abdel-Aty, M., Dos Santos, C., **Gayah, V.V.**, Dhindsa, A. and Dilmore, J. (2006) The potential of ITS applications to reduce crash potential on urban freeways using micro-simulation. *International Symposium of Transport Simulation*, September, Lausanne, Switzerland.

RESEARCH REPORTS TO SPONSOR

1. **Gayah, V. V.**, Zhang, P.* and Donnell, E.T. (2023) Crash Modification Factors for high friction surface treatment in Pennsylvania. *Final Report for the Pennsylvania Department of Transportation*, PennDOT-2023-ECMS-E04834-WO15.
2. **Gayah, V.V.**, Donnell, E.T., Prajapati, A.** and Liu, H.* (2023). Crash Modification Factors for high-tension cable median barriers in Pennsylvania, *Final Report for the Pennsylvania Department of Transportation*, PennDOT-2023-ECMS-E04834-WO14.
3. Guler, S.I., **Gayah, V.V.**, Liu, H.*, Chowdhury, L. and French, S. (2023) Behavior Safety in Pennsylvania, *Final Report for the Pennsylvania Department of Transportation*, FHWA-PA-2023-008-PSU WO 008.
4. Porter, R.J., Hamilton, I., **Gayah, V.V.**, Peach, K., Le, T., Persaud, B., Lyon, C., Hadayeghi, A., and Salek, S. (2023) Proposed Macro-Level Safety Planning Analysis Chapter for the Highway Safety Manual. *Draft NCHRP Final Report*.
5. Porter, R.J., Hamilton, I., **Gayah, V.V.**, Peach, K., Le, T., Persaud, B., Lyon, C., Hadayeghi, A., and Salek, S. (2023) Macro-level analysis of safety planning and crash prediction models: A guide. *NCHRP Research Report 1044*.
6. Himes, S., **Gayah, V.V.**, Gooch, J.*, O'Connor, G. and Le, T. (2023) Safety comparison of interchange configurations. *Tech Brief for the Federal Highway Administration*, FHWA Report No. FHWA-HRT-23-029.
7. **Gayah, V.V.**, Guler, S.I., Liu, H.*, Blackburn, L. and Hamilton, I. (2022) Quantification of systemic risk factors for pedestrian safety in North Carolina, *Final Report for the North Carolina Department of Transportation*, FHWA/NC/2022-11.
8. Pawlovich, M., **Gayah, V.V.** and Guler, S.I. (2022) Financial benefits of proposed access management treatments. *Final Report for the Mountain Plains Consortium*, Report No. MPC 22-464.
9. Torbic, D.T, Potts, I.B., Guler, S.I., **Gayah, V.V.**, Harwood, D.W., Grembek, O., Griswold, J.B. and Turner, S.A. (2022) Pedestrian and Bicycle Safety Performance Functions for the Highway Safety Manual. *NCHRP 17-84 Final Report for the Transportation Research Board*, Washington, DC.
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11. Akyildiz, A., Pan, B., Xu, G., **Gayah, V.V.**, Esser, S., Hannon, J., Taff, D. and Newman, P. (2022) Microsimulation of emergency evacuation of Bear Lake and Wild Basin in Rocky Mountain National Park. *Final Report for the National Park Service*.
12. **Gayah, V.V.** and Donnell, E.T. (2022) Updated CMFs for adaptive traffic signals in Pennsylvania. *Final Report for the Pennsylvania Department of Transportation*.

13. Papakonstantinou, K.G., Guler, S.I., **Gayah, V.V.**, Saifullah, M., Andriotis, C.P. and Lu, M.** (2022) AI-enabled fiscally constrained lifecycle asset management for infrastructure systems. *Final Report for Center for Integrated Asset Management for Multimodal Transportation Infrastructure Systems*, LTI 2022-05.
14. Hamilton, I., Kersavage, K.**, Porter, R.J., Smith, K., Sanchez, J., **Gayah, V.V.** and Eccles, K. (2021) An exploration of pedestrian safety through the integration of HSIS and emerging data sources: Case study in Charlotte, NC. *Final Report for the Federal Highway Administration*, FHWA-HRT-21-087.
15. Jenior, P., Bonneson, J., Zhao, L., Kittelson, W., Donnell, E.T. and **Gayah, V.V.** (2021) Safety Performance of part-time shoulder use on freeways, Volume 2: Conduct of Research Report. *NCHRP Web-Only Document 309*, Transportation Research Board, Washington, DC.
16. Jenior, P., Bonneson, J., Zhao, L., Kittelson, W., Donnell, E.T. and **Gayah, V.V.** (2021) Safety Performance of part-time shoulder use on freeways, Volume 1: Information Guide and Safety Evaluation Guidelines. *NCHRP Web-Only Document 309*, Transportation Research Board, Washington, DC.
17. Himes, S., Bonneson, J., Liu, C. and **Gayah, V.V.** (2021) HOV/HOT Freeway Crash Prediction Method for the Highway Safety Manual. *NCHRP 17-89A Final Report for the Transportation Research Board*, Washington, DC.
18. Himes, S., Bonneson, J., Liu, C. and **Gayah, V.V.** (2021) HOV/HOT Safety Implementation Guide. *Transportation Research Board*, Washington, DC.
19. **Gayah, V.V.**, Donnell, E.T. and Tang, H. (2020) Adaptive signals crash modification factors. *Final Report for the Pennsylvania Department of Transportation*, PA-2020-001-511601 WO 013.
20. Porter, R.J., Dunn, M., Hamilton, I., Gooch, J.P.* and **Gayah, V.V.** (2019) Safety analysis needs assessment for Transportation Systems Management and Operations. *Report for the Federal Highway Administration*, FHWA-SA-19-041.
21. **Gayah, V.V.**, Guler, S.I. and Donnell, E.T. (2019) Pennsylvania traffic records integration plan. *Final Report for the Pennsylvania Department of Transportation*, FHWA-PA-008-PSU WO 008.
22. Donnell, E.T., **Gayah, V.V.**, Li, L.** and Tang, H.** (2019) Regionalized urban-suburban collector road safety performance functions. *Final Report for the Pennsylvania Department of Transportation*, PA-2019-01-511601 WO 007.
23. Donnell, E.T., **Gayah, V.V.**, Kersavage, K.** and Yu, Z.* (2017) Crash data safety factors evaluation. *Final Report for the Pennsylvania Department of Transportation*, FHWA-PA-2017-004-PSU WO 3.
24. Donnell, E.T., **Gayah, V.V.**, Yu, Z.*, Li, L.** and DePrator, A.* (2016) Speed limits set lower than engineering recommendations. *Final Report for the Montana Department of Transportation*, FHWA/MT-16-008/8225-01.
25. Chavis, C.C., **Gayah, V.V.**, Kim, M., Chen, L., Miller-Hooks, E. and Schonfeld, P. (2016) Integration of multimodal transportation services. *Final Report for the Mid-Atlantic Universities Transportation Center*, Report No. MAUTC-2013-03.
26. Donnell, E.T., **Gayah, V.V.** and Li, L.** (2016) Regionalized safety performance functions. *Final Report for the Pennsylvania Department of Transportation*, FHWA-PA-2016-001-PSU WO 17.
27. **Gayah, V.V.**, Yu, Z.* and Wood, J.S.** (2015) Estimating uncertainty of bus arrival times and passenger occupancies. *Final Report for the Mineta National Transit Research Consortium*, MNTC Report No. 12-56.
28. **Gayah, V.V.**, Nagle, A.S.*, Rakha, H. and Du, J. (2015) Using mobile probes to inform and measure the effectiveness of traffic control strategies on urban networks. *Final Report for the Mid-Atlantic Universities Transportation Center*, MAUTC-2012-02.
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30. **Gayah, V.V.** and Donnell, E.T. (2014) Establishing Crash Modification Factors and their use. *Final Report for the Pennsylvania Department of Transportation*, FHWA-PA-2014-005-PSU WO 6.
31. **Gayah, V.V.**, Stieffenhofer, K.* and Shankar, V. (2014) How can we maximize efficiency and increase person occupancy at overcrowded park and rides? *Final Report for the Washington State Department of Transportation*, WA-RD 830.1.
32. Argote, J., Carnarius, K., Ehrick, T., **Gayah, V.V.**, Griswold, J., Lidicker, J., Medury, A. and Xuan, Y. (2011) An Initial Analysis of the Bear Transit System Operations: A report for University of California at Berkeley Department of Parking and Transportation.

33. Abdel-Aty, M., Pande, A., Lee, C., **Gayah, V.V.**, Cunningham, R., Dhindsa, A. and Dilmore, J. (2007) Linking crash patterns to ITS-related archived data: Phase II Volume II: Evaluations of ITS strategies. *Final Report for the Florida Department of Transportation*.
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OTHER PUBLICATIONS

1. **Gayah, V.V.** (2021) Sick of dangerous city traffic? Remove left turns. *The Conversation*. [article read over 30,000 times]
2. Ahn, S., Coifman, B., **Gayah, V.V.**, Hadi, M., Hamdar, S., Leclercq, L., Mahmassani, H., Menendez, M., Skabardonis, A. and van Lint, H. (2019) Traffic Flow Theory and Characteristics, *Centennial Paper for the Transportation Research Board*.
3. Zheng, G.**, Zang, X., Xu, N., Wei, H.**, Yu, Z.*, **Gayah, V.V.**, Xu, K. and Li, Z. (2019) Diagnosing reinforcement learning for traffic signal control. arXiv: 1905.04716v1.
4. Wei, H.**, Zheng, G.**, **Gayah, V.V.** and Li, Z. (2019) Traffic signal control: A survey. arXiv:1904.08117v2.
5. **Gayah, V.V.** and Guler, S.I. (2018) Math explains why your bus route seems so unreliable. *The Conversation*. [article read over 51,000 times]
6. **Gayah, V.V.**, Donnell, E.T. and Jovanis, P.P. (2014) Pennsylvania CMF Guide. *Prepared for the Pennsylvania Department of Transportation*.
7. Gu, W., **Gayah, V.V.**, Cassidy, M.J. and Saade, N. (2014) On the Impacts of Bus Stops near Signalized Intersections: Models of Car and Bus Delays. *UC Berkeley Volvo Working Paper UCB-ITS-VWP-2014-01*, Institute of Transportation Studies, Berkeley, CA.
8. **Gayah, V.V.** (2012) Two-way street networks: More efficient than previously thought? *ACCESS Magazine*, Number 41 (Fall 2012), pp. 10-15.
9. Campbell, R., Christofa, E., Argote, J., **Gayah, V.V.**, Guler, I., Skabardonis, A. (2012) Operating a diverging diamond interchange: A signal timing optimization strategy. *Final Report of the Transportation Research Board's Traffic Signal Systems Committee*.
10. **Gayah, V.V.** (2012) The aggregate effect of turns on urban traffic networks. Ph.D. Thesis. University of California, Berkeley.
11. Gu, W., Cassidy, M.J., **Gayah, V.V.** and Ouyang, Y. (2012) Strategies for mitigating impacts of near-side bus stops on cars. *UC Berkeley Volvo Working Paper UCB-ITS-VWP-2012-01*, Institute of Transportation Studies, Berkeley, CA.
12. Daganzo, C.F., Gonzales, E.J. and **Gayah, V.V.** (2011) Traffic congestion in networks, and alleviating it with public transportation and pricing. *UC Berkeley Volvo Working Paper UCB-ITS-VWP-2011-07*, Institute of Transportation Studies, Berkeley, CA.
13. **Gayah, V.V.** and Daganzo, C.F. (2010) Clockwise hysteresis loops in the Macroscopic Fundamental Diagram. *UC Berkeley Volvo Working Paper UCB-ITS-VWP-2010-08*, Institute of Transportation Studies, Berkeley, CA.
14. **Gayah, V.V.** and Daganzo, C.F. (2010) Exploring the effect of turning maneuvers and route choice on a simple network. *UC Berkeley Volvo Working Paper UCB-ITS-VWP-2010-05*, Institute of Transportation Studies, Berkeley, CA.
15. Gonzales, E.J., Pilachowski, J., **Gayah, V.V.**, Cassidy, M.J. and Daganzo C.F. (2010) Public transportation systems: Mini-projects and homework exercises. *UC Berkeley Course Notes UCB-ITS-CN-2010-02*, Institute of Transportation Studies, Berkeley, CA.
16. Daganzo, C.F., **Gayah, V.V.** and Gonzales E.J. (2010) Macroscopic relations of urban traffic variables: An analysis of instability. *UC Berkeley Volvo Working Paper UCB-ITS-VWP-2010-04*, Institute of Transportation Studies, Berkeley, CA.
17. Xuan, Y., **Gayah, V.V.**, Daganzo, C.F. and Cassidy, M.J. (2009) Multimodal traffic at isolated intersections: New management strategies to increase capacity. *UC Berkeley Volvo Working Paper UCB-ITS-VWP-2009-10*, Institute of Transportation Studies, Berkeley, CA.

18. Gayah, V.V. (2006) Examining route diversion and multiple ramp metering strategies for reducing real-time crash risk on urban freeways. M.S. Thesis. University of Central Florida, Orlando, FL.

RESEARCH IN THE PRESS

1. Fetzer, M. "Engineers to explore ways to improve rural-urban commutes" 01 December, 2022
<https://news.engr.psu.edu/2022/gayah-vikash-rural-urban-commutes.aspx>
2. "Yes, restructuring left-turn lanes in some areas will help alleviate traffic congestion", *WCNC Charlotte*, 22 March 2022.
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3. "Limiting left-hand turns relieves traffic woes, reduces accidents", *Study Finds*, 27 February 2022.
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4. "Let's ban left turns", *The Academic Minute* via WAMC Northeast Public Radio, 2 August 2021.
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5. "How to speed up your drive: Don't turn left", *Radio Health Journal* podcast, 11 July 2021.
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6. *Top of Mind* podcast, 22 June 2021.
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7. Fisher, T. "Can banning left turns improve traffic congestion and safety?". *Land Line*, 16 June 2021.
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9. Delbert, C. "We should abolish the left turn, science suggest." *Popular Mechanics*, 14 June 2021.
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11. Pallotto, B. "Speed limits set too low cause more crashes, Penn State researchers say." *Centre Daily Times*, 16 January 2019.
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12. Bishop, E. "More crashes when speed limits set far below recommendation." *Market Business News*, 13 December 2018.
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13. Borodevyc, A. "Crashes increase when speed limits dip far below engineering recommendation." *Penn State News*, 12 December 2018.
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14. Vaccaro, A. "Is a fire just a mechanical issue? How the MBTA alerts riders about problems." *Boston Globe*, 3 December 2018.
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15. Bliss, L. "When is a dedicated bus lane not a dedicated bus lane?" *CityLab*, 31 May 2018.
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16. Gallagher, T. "Eliminating one-ways would benefit city." *Indianapolis Business Journal*, 18 March 2017.
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17. Bamforth, E. "Switching from one-way to two-way streets? Experts explain the trend." *Cleveland.com*, 21 February 2017.
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18. Anderson, J. "Second Street debate: Economy vs. quality of life." *Marshfield News Herald*, 19 June 2015. <http://www.marshfieldnews Herald.com/story/news/local/2015/06/19/second-street-project-spurs-debate/28983947/>
19. Qian, J. "Berkeley transportation commission to discuss converting 3 city streets to 2-way streets." *Daily Californian*, 17 February, 2015. <http://www.dailycal.org/2015/02/17/berkeley-transportation-commission-consider-converting-3-city-streets-2-way-streets/>
20. Jaffe, E. "The case against one-way streets." *CityLab* (formerly *Atlantic Cities*), 31 January, 2013. <http://www.theatlanticcities.com/commute/2013/01/case-against-one-way-streets/4549/>

PRESENTATIONS

RESEARCH PRESENTATIONS AT CONFERENCES OR OTHER MEETINGS

1. Yocum, R.L.* and **Gayah, V.V.** (2022) Investigating the inclusion of traffic operations concepts in undergraduate civil engineering curricula. *ASEE Zone 1 Conference*, 30 March – 1 April, University Park, PA.
2. Liu, H. and **Gayah, V.V.** (2022) A travel delay based Max Pressure algorithm. *INFORMS Annual Meeting 2022*, 18 October, Indianapolis, Indiana.
3. Lu, M., Guler, S.I. and **Gayah, V.V.** (2022) Multi-objective optimization considering safety for maintenance and rehabilitation decision making. *Transportation Asset and Infrastructure Management Conference*, 17 October, State College, Pennsylvania.
4. Akyildiz, A.**, Pang, B., Xu, G.* and **Gayah, V.V.** (2022) Agent-based microsimulations for emergency evacuation in Rocky Mountain National Park. *NETTRA Research Colloquium*, 20 January, virtual.
5. Yocum, R.L.* and **Gayah, V.V.** (2021) Investigating relationships between county-level crash costs and socioeconomic indicators in Pennsylvania. *2021 Transportation Engineering and Safety Conference*, 8-10 December, University Park, Pennsylvania.
6. Lu, M.**, **Gayah, V.V.** and Guler, S.I. (2021) Analysis of shared bike and other exposure measures in a macroscopic crash frequency model. *2021 Transportation Engineering and Safety Conference*, 8-10 December, University Park, Pennsylvania.
7. Taglieri, D. and **Gayah, V.V.** (2021) Comparison of operational performance of roundabouts vs. traffic signals in urban street networks. *2021 Transportation Engineering and Safety Conference*, 8-10 December, University Park, Pennsylvania.
8. Xu, G.*, Zhang, P.** and **Gayah, V.V.** (2021) Network Exit Function (NEF) under fast-varying demand. *2021 Transportation Engineering and Safety Conference*, 8-10 December, University Park, Pennsylvania.
9. Zhou, D.* and **Gayah, V.V.** (2021) Improve reinforcement learning-based perimeter metering control methods with domain control knowledge. *2021 Transportation Engineering and Safety Conference*, 8-10 December, University Park, Pennsylvania.
10. Runa, F.*, Guler, S.I. and **Gayah, V.V.** (2021) Do existing split failure metrics accurately reflect pedestrian operation at signalized intersections? *2021 Transportation Engineering and Safety Conference*, 8-10 December, University Park, Pennsylvania.
11. Zhou, D.* and **Gayah, V.V.** (2020) Deep reinforcement learning applied to perimeter metering control: An overview. *2020 Transportation Engineering and Safety Conference*, 9-11 December, University Park, Pennsylvania.
12. Guler, S.I., **Gayah, V.V.** and Liang, X.* (2020) Signal control utilizing Connected Vehicle information. *INFORMS Annual Meeting 2020*, 10 November.
13. Wei, H.**, Li, Z. and **Gayah, V.V.** (2020) Deep reinforcement learning for traffic signal control. *2020 IEEE Intelligent Transportation Systems Conference*, 20-23 September, Rhodes, Greece.
14. Yocum, R.L.* and **Gayah, V.V.** (2019) Determining the effect of wealth on crash frequency in Pennsylvania. *2019 Transportation Engineering and Safety Conference*, 11-13 December, University Park, Pennsylvania. **[Best student presentation runner-up]**

15. Xu, G.* and **Gayah, V.V.** (2019) Safety performance functions for urban-suburban collector roadways incorporating K-factor and D-factor. *2019 Transportation Engineering and Safety Conference*, 11-13 December, University Park, Pennsylvania. [**Best student presentation award**]
16. Zhou, D.*, Bagherzadehkhosrasi, A. and **Gayah, V.V.** (2019) Travel time prediction using large-scale taxi trip records data. *2019 Transportation Engineering and Safety Conference*, 11-13 December, University Park, Pennsylvania.
17. Guadamuz, R.**, **Gayah, V.V.** and Paleti, R. (2019) Impact of bus routes on crash frequency in metropolitan areas. *2019 Transportation Engineering and Safety Conference*, 11-13 December, University Park, Pennsylvania.
18. Guadamuz, R.**, Tang, H.**, Yu, Z.* Guler, S.I. and **Gayah, V.V.** (2019) Green-time usage metrics on signalized intersections with high-resolution data. *Transportation Research Board Traffic Signal Systems Committee Midyear Meeting*, 7 August, Woods Hole, Massachusetts. [**Second place, TRB Traffic Signal Systems Committee Big Data Challenge**]
19. Liang, X.*, Guler, S.I. and **Gayah, V.V.** (2018) Joint optimization of signal phasing and timing and speed guidance in a Connected and Autonomous Vehicle environment. *2018 Transportation Engineering and Safety Conference*, 5-7 December, University Park, Pennsylvania. [**Best student presentation award**]
20. Yu, Z.* and **Gayah, V.V.** (2018) A comparison of different urban street network configurations' resilience to disruptions. *2018 Transportation Engineering and Safety Conference*, 5-7 December, University Park, Pennsylvania.
21. Yu, Z.* and **Gayah, V.V.** (2018) "TSP" at isolated intersections: Some advances under simulation environment. *2018 Transportation Engineering and Safety Conference*, 5-7 December, University Park, Pennsylvania.
22. Hitchcock, O.* and **Gayah, V.V.** (2017) Methods to reduce dimensionality and identify candidate solutions in multi-objective signal timing problems. *2017 Transportation Engineering and Safety Conference*, 6-8 December, University Park, Pennsylvania.
23. Yu, Z.* and **Gayah, V.V.** (2017) Resilience for urban street networks: An analytical comparison under light traffic. *2017 Transportation Engineering and Safety Conference*, 6-8 December, University Park, Pennsylvania. [**Best student presentation award**]
24. Liang, X.*, Guler, S.I. and **Gayah, V.V.** (2017) Signal timing optimization with Connected Vehicle Technology: Platooning to improve computational efficiency. *2017 Transportation Engineering and Safety Conference*, 6-8 December, University Park, Pennsylvania.
25. Hitchcock, O.* and **Gayah, V.V.** (2017) Methods to identify candidate solutions in multi-objective signal timing optimization. *MASITE Annual Conference*, 2 October, Egg Harbor City, New Jersey.
26. Li, L.**, **Gayah, V.V.** and Donnell, E.T. (2017) Development of regionalized SPFs for two-lane rural roads in Pennsylvania. *2017 Pennsylvania Automated Vehicle Summit*, 11-12 September, State College, Pennsylvania.
27. Liang, X.*, Guler, S.I. and **Gayah, V.V.** (2017) Signal timing optimization with Connected Vehicle technology: Platooning to improve computational efficiency. *2017 Pennsylvania Automated Vehicle Summit*, 11-12 September, State College, Pennsylvania.
28. Yu, Z.*, **Gayah, V.V.** and Christofa, E. (2016) Person-based signal timing optimization to account for flexible cycle lengths and uncertain transit vehicle arrivals. *2016 Transportation Engineering and Safety Conference*, 7-9 December, University Park, Pennsylvania.
29. DePrator, A.J.*, Hitchcock, O.* and **Gayah, V.V.** (2016) Improving street network efficiency by prohibiting left turns at signalized intersections. *2016 Transportation Engineering and Safety Conference*, 7-9 December, University Park, Pennsylvania. [**Best student presentation award**]
30. Patterson, M.R and **Gayah, V.V.** (2016) Modeling the impacts of transit signal priority along North Atherton Street. *2016 Transportation Engineering and Safety Conference*, 7-9 December, University Park, Pennsylvania.
31. Wu, K.**, Guler, S.I. and **Gayah, V.V.** (2016) A queuing and variational theory approach to estimating the impacts of bus stops on transit signal priority. *2016 Transportation Engineering and Safety Conference*, 7-9 December, University Park, Pennsylvania.
32. Harmony, X.* and **Gayah, V.V.** (2015) Passenger expectations with and perceptions of real-time transit information. *2015 Transportation Engineering and Safety Conference*, 9-11 December, University Park, Pennsylvania.

33. DePrator, A.*, Hitchcock, O.* and **Gayah, V.V.** (2015) Analysis of dynamic left-turn restrictions on urban grid networks. *2015 Transportation Engineering and Safety Conference*, 9-11 December, University Park, Pennsylvania.
34. Yu, Z.* and **Gayah, V.V.** (2015) Modeling bus transit operations: Passenger occupancy and travel time. *2015 Transportation Engineering and Safety Conference*, 9-11 December, University Park, Pennsylvania.
35. Gu, W., **Gayah, V.V.**, Cassidy, M.J., Ouyang, Y. (2012). Impacts on car and bus delays from bus stops near signalized intersections. *The 5th Conference on Future Urban Transport*, 15-17 October, Goteborg, Sweden.
36. Campbell, R., Christofa, E., Argote, J., **Gayah, V.V.**, Guler, I. and Skabardonis, A. (2012) Diverging diamond interchange competition. *Transportation Research Board Traffic Signal Systems Committee Midyear Meeting*, 24 July, Irvine, California.
37. Gu, W., **Gayah, V.V.**, Cassidy, M.J., Ouyang, Y. (2012). Mitigating negative impacts on cars from bus stops near signalized intersections. *NSF CMMI Engineering Research and Innovation Conference 2012*, 9-12 July, Boston, Massachusetts.
38. **Gayah, V.V.** (2012) Modeling urban traffic networks. *UC Berkeley Transportation Engineering Program Open House*, 6 April, Berkeley, California.
39. **Gayah, V.V.** (2012) The aggregate effect of turns on urban traffic networks. Seminar for *the Institute of Transportation Studies at the University of California*, Berkeley, 24 February, Berkeley, California.
40. **Gayah, V.V.** (2012) The aggregate effect of turns on urban traffic networks. Workshop for Doctoral Student Research in Transportation Modeling, *91st Annual Meeting of the Transportation Research Board*, 22-26 January, Washington DC.
41. **Gayah, V.V.** (2011) The effect of route choice and turning maneuvers on the stability of a traffic network. *Volvo Research and Education Foundation Workshop*, 26-29 October, Beijing, China.
42. **Gayah, V.V.** and Daganzo, C.F. (2011) An analytical comparison of the ability of one-way and two-way street networks to serve cars and buses. *17th Annual University of California Transportation Center Student Conference*, 24-25 February, Berkeley, California.
43. Daganzo, C.F., Cassidy, M.J., **Gayah, V.V.** and Xuan, Y. (2008) Increasing intersection capacity with multiple modes. *Volvo Research and Education Foundation Workshop*, 18-21 May, Berkeley, California.
44. **Gayah, V.V.** (2006) Using micro-simulation to develop real-time traffic crash mitigation strategies on a major urban freeway. *3rd Annual Graduate Research Forum at the University of Central Florida*, May, Orlando, Florida.

INVITED TALKS

1. **Gayah, V.V.** (2023) Improving mobility in urban street networks via network-wide and decentralized traffic signal control strategies. Seminar at the *Arizona State University*, 13 April, Tempe, Arizona.
2. **Gayah, V.V.** (2022) Decentralized methods for traffic signal control in a Connected Vehicle environment. Seminar at the *University of Pittsburgh*, 28 October, Pittsburgh, Pennsylvania.
3. **Gayah, V.V.** (2022) Signal control utilizing Connected Vehicle information. Seminar at the *Pennsylvania State University Operations Research Colloquium*, 15 March, University Park, Pennsylvania.
4. **Gayah, V.V.** (2022) Application of deep reinforcement learning for perimeter metering control. Seminar for the *University of Michigan Next Generation Transportation Seminar Series*, 24 Feb.
5. Donnell, E.T., **Gayah, V.V.**, Gross, F. and Le, T. (2021) Focus Crash and Facility Type (FCFT): Researcher Workshop. *An evaluation of low-cost safety improvements pooled fund study (ELCSI_PFS) effort*, 15 Nov.
6. Donnell, E.T., **Gayah, V.V.**, Gross, F. and Le, T. (2021) Focus Crash and Facility Type (FCFT): Practitioner Workshop. *An evaluation of low-cost safety improvements pooled fund study (ELCSI_PFS) effort*, 3 Nov.
7. **Gayah, V.V.** (2021) Perimeter metering control for two-region urban networks using deep reinforcement learning. Seminar for the *Pacific Northwest Transportation Consortium*, 2 April.
8. **Gayah, V.V.** (2021) An introduction to traffic engineering. Seminar at the *Iowa State University*, 25 March.
9. **Gayah, V.V.** (2021) Deep reinforcement learning applied to perimeter metering control in urban networks. Webinar presentation for *World Conference on Transportation Research, Special Interest Group on Intelligent Transport Systems*, 24 March.

10. **Gayah, V.V.** (2020) Perimeter metering control for two-region urban networks: A deep reinforcement learning approach. Seminar at the *University of California, Irvine*, 20 November.
11. **Gayah, V.V.** (2020) Perimeter metering control for two-region urban networks using deep reinforcement learning. Seminar at the *University of Wisconsin, Madison*, 13 October.
12. **Gayah, V.V.** (2020) Application of deep reinforcement learning for perimeter metering control in urban networks with MFDs. Webinar presentation for *Transportation Research Board, Committee on Traffic Flow Theory and Characteristics*, 9 July.
13. **Gayah, V.V.** (2019) Traffic signal control in a connected and autonomous vehicle environment. *2019 Transportation Engineering and Safety Conference*, 11-13 December, University Park, Pennsylvania.
14. **Gayah, V.V.** (2019) My thoughts on the Promotion and Tenure process. *Penn State Civil and Environmental Engineering Department*, 22 November, University Park, Pennsylvania.
15. **Gayah, V.V.** (2019) Traffic signal control in a mixed human and AV environment. *Pennsylvania AV Summit*, 4-6 September, Pocono Manor, Pennsylvania.
16. **Gayah, V.V.** (2019) Traffic signal control in Smart Cities: Intersection, arterial and network-level approaches. Seminar at the *University of Central Florida*, 24 May, Orlando, Florida.
17. **Gayah, V.V.** (2018) Signalized intersection control in a connected and autonomous vehicle environment. *2018 Transportation Engineering and Safety Conference*, 5-7 December, University Park, Pennsylvania.
18. Zappe, S., Cutler, S. and **Gayah, V.V.** (2018) Engineering Education Innovation Academy, *Innovative Teaching at Penn State (ITAP) Brown Bag Lunch Series*, 2 November, University Park, Pennsylvania.
19. **Gayah, V.V.** (2018) Solving big-picture questions in urban mobility and traffic safety. Seminar at the *University of Pittsburgh*, 19 October, Pittsburgh, Pennsylvania.
20. Liang, X.*, Guler, S.I. and **Gayah, V.V.** (2018) Signal timing optimization using Connected Vehicle technology. *USDOT ITS-JPO Professional Capacity Building T3e webinar*.
21. **Gayah, V.V.** (2018) Advances in modeling and control of urban traffic networks using Macroscopic Fundamental Diagrams. *UC Berkeley ITS Research Symposium*, 20-21 June, Berkeley, CA.
22. **Gayah, V.V.** (2018) Applying less detailed models to design transportation systems. Seminar at the *Pennsylvania State University Electrical Engineering Colloquium*, 1 March, University Park, Pennsylvania.
23. **Gayah, V.V.** and Donnell, E.T. (2017) Safety and operational impacts of setting speed limits below engineering recommendations. *2017 AASHTO Research Advisory Committee High-Value Research Maintenance and Safety Projects session at the 97th Annual Meeting of the Transportation Research Board*, 7-11 January, Washington, D.C.
24. **Gayah, V.V.** (2017) Applying approximate models to design transportation systems. Seminar at the *Pennsylvania State University Operations Research Colloquium*, 17 October, University Park, Pennsylvania.
25. **Gayah, V.V.** (2017) Traffic operations research at Penn State. Invited presentation at the *PennDOT Statewide Traffic Operations Meeting*, 14 June, State College, PA.
26. **Gayah, V.V.** (2016) Network-wide traffic congestion models: Application to street network design and left-turn treatments. *2016 Transportation Engineering and Safety Conference*, 7-9 December, University Park, Pennsylvania.
27. **Gayah, V.V.** (2016) Safety and operational effects of setting speed limits lower than engineering recommendations. *2016 Transportation Engineering and Safety Conference*, 7-9 December, University Park, Pennsylvania.
28. **Gayah, V.V.** (2016) Research at PSU to improve transit system performance, reliability and flexibility. Invited presentation at the *Ecolane PA Partners Conference*, 28 October, University Park, PA. [**keynote presentation**]
29. **Gayah, V.V.** (2016) Modeling aggregated vehicle interactions in urban transportation networks. Invited presentation at the *University of Florida*, 15 September, Gainesville, Florida.
30. **Gayah, V.V.** (2015) My advice to transportation engineering graduate students. Invited presentation at the *SAFER-SIM Symposium*, 5 October, Orlando, Florida.

31. **Gayah, V.V.** (2015) The Macroscopic Fundamental Diagram: A tool for modeling large-scale urban networks. Workshop sponsored by the Mid-Atlantic Universities Transportation Center *Monitoring and Controlling Urban Transportation Networks: Theory and Applications*, 8 June, Arlington, Virginia.
32. **Gayah, V.V.** (2015) My advice to transportation engineering PhD students. Invited presentation at the Transportation Network Modeling (ADB30) Committee's Student Mixer Event, *94th Annual Meeting of the Transportation Research Board*, 13 January, Washington, DC.
33. **Gayah, V.V.** (2014) Transportation research to solve contemporary issues: Urban mobility and traffic safety. Seminar at the *University of Pittsburgh*, 24 October, Pittsburgh, Pennsylvania.
34. **Gayah, V.V.** and Donnell, E.T. (2014) What are CMFs and how to use them? Presentation for the *Pennsylvania Department of Transportation*, 19 September, Harrisburg, Pennsylvania.
35. **Gayah, V.V.** (2014) Mitigating instabilities in congested networks with adaptive signal control and driver routing. Webinar presentation for *Transportation Research Board, Committee on Traffic Flow Theory and Characteristics*, 9 May.
36. **Gayah, V.V.** (2014) The impact of adaptive driving and adaptive signal control on network stability. Seminar at the *University of Massachusetts*, 24 April, Amherst, Massachusetts.
37. **Gayah, V.V.** (2013) Using macroscopic models to study large-scale transportation systems. Seminar at the *Ecole Polytechnique Federale de Lausanne*, 28 November, Lausanne, Switzerland.
38. **Gayah, V.V.** (2013) Using macroscopic models to study transportation systems. Seminar at the *Pennsylvania State University Operations Research Colloquium*, 19 November, University Park, Pennsylvania.
39. **Gayah, V.V.** (2013) The aggregate impacts of route choice and turning maneuvers on urban traffic. Seminar at the *University of Washington*, 8 April, Seattle, Washington.
40. **Gayah, V.V.** (2013) Modeling transportation networks using aggregate traffic models. Seminar for the *Pennsylvania State University Network Science group*, 2 April, University Park, Pennsylvania.
41. **Gayah, V.V.** (2013) Using macroscopic models to describe traffic dynamics on urban networks. Seminar at the *Swiss Federal Institute of Technology (ETH) Zurich*, 8 March, Zurich, Switzerland.
42. **Gayah, V.V.** (2012) Aggregate relationships on urban traffic networks: Bifurcations, instabilities and dynamics. Seminar at *Rutgers University*, 24 October, Piscataway, New Jersey.
43. **Gayah, V.V.** (2012) The aggregate effect of turns on urban traffic networks. Seminar at the *Pennsylvania State University*, 27 January, University Park, Pennsylvania.
44. **Gayah, V.V.** (2011) Exploring the effect of turning maneuvers and route choice on a simple network. Webinar presentation for *Transportation Research Board, Committee on Traffic Flow Theory and Characteristics*, 19 August.
45. **Gayah, V.V.** and Daganzo, C.F. (2011) Macroscopic relations of urban traffic variables: Instability, bifurcations and hysteresis. *SIAM Conference on Application of Dynamical Systems*, 22-26 May, Snowbird, Utah.

GUEST LECTURES

1. **Gayah, V.V.** and Cisco, B. (2022) *TE-43 Multimodal Transportation Operations: Evaluation Methods and Performance Measures*, 17-26 May, Berkeley, California. [short course for UC Berkeley Tech Transfer]
2. **Gayah, V.V.** (2022) Macroscopic models of urban traffic. *CE 522 – Traffic Flow Theory and Simulation*, 4-6 April, University Park, Pennsylvania.
3. **Gayah, V.V.** (2022) Introduction to transportation engineering. *CE 100S – Freshman Seminar*, 11 February, University Park, Pennsylvania.
4. **Gayah, V.V.** (2021) The role of public transportation in sustainable urban planning and development. *CE 100S – Freshman Seminar*, 27 October, University Park, Pennsylvania.
5. **Gayah, V.V.** (2021) Introduction to transportation engineering. *CE 100S – Freshman Seminar*, 19 February, University Park, Pennsylvania.
6. **Gayah, V.V.** (2020) Introduction to transportation engineering and recent work on street network design. *CE 100S – Freshman Seminar*, 2 December, University Park, Pennsylvania.

7. **Gayah, V.V.** (2020) The role of public transportation in sustainable urban planning and development. *CE 100S – Freshman Seminar*, 21 October, University Park, Pennsylvania.
8. **Gayah, V.V.** (2018) The role of public transportation in sustainable urban planning and development. *Pennsylvania State University's Presidential Leadership Academy*, 16 January, University Park, PA.
9. **Gayah, V.V.** (2013) Some observed traffic phenomena. Traffic Engineering class at the *Swiss Federal Institute of Technology (ETH) Zurich*, 26 November, Zurich, Switzerland.
10. **Gayah, V.V.** (2011) The transportation engineering profession. Civil and Environmental Engineering Class, *CE 98: Civil and Environmental Engineering Professional Certification I*, 9 November, Berkeley, California.

PANEL AND WORKSHOP PRESENTATIONS

1. **Gayah, V.V.** (2022) My thoughts on the promotion and tenure process: A workshop for assistant professors. *Department of Civil and Environmental Engineering*, 14 October, University Park, Pennsylvania.
2. **Gayah, V.V.** (2022) A day in the life of an engineering professor. *College of Engineering New Faculty Orientation*, 19 August, University Park, Pennsylvania.
3. **Gayah, V.V.** (2022) Panel discussion with recent NSF CAREER awardees. *College of Engineering NSF Proposal Preparation Workshop*, 10 May, University Park, Pennsylvania.
4. **Gayah, V.V.** (2022) Transportation Research Record Editors panel for TRB Young Members Council. *101st Annual Meeting of the Transportation Research Board*, 9 January, Washington, DC.
5. **Gayah, V.V.** (2021) Academic paper writing. *Workshop at the Pennsylvania State University*, 17 November, University Park, Pennsylvania.
6. **Gayah, V.V.** (2021) A day in the life of an engineering professor. *College of Engineering New Faculty Orientation*, 19 August, University Park, Pennsylvania.
7. **Gayah, V.V.** (2020) A day in the life of an engineering professor. *College of Engineering New Faculty Orientation*, 4 December, University Park, Pennsylvania.
8. **Gayah, V.V.** (2020) Fudge-up Friday. *Penn State College of Engineering*, 23 October, University Park, Pennsylvania.
9. **Gayah, V.V.** (2019) My thoughts on the promotion and tenure process: A workshop for assistant professors. *Department of Civil and Environmental Engineering*, 22 November, University Park, Pennsylvania.
10. **Gayah, V.V.** (2019) A day in the life of an engineering professor. *College of Engineering New Faculty Orientation*, 22 August, University Park, Pennsylvania.
11. **Gayah, V.V.** (2018) A day in the life of an engineering professor. *College of Engineering New Faculty Orientation*, 14 August, University Park, Pennsylvania.
12. **Gayah, V.V.** (2018) Panel discussion with recent NSF CAREER awardees. *College of Engineering NSF Proposal Preparation Workshop*, 8 May, University Park, Pennsylvania.
13. **Gayah, V.V.** (2017) A day in the life of an engineering professor. *College of Engineering New Faculty Orientation*, 16 August, University Park, Pennsylvania.
14. **Gayah, V.V.** (2016) A day in the life of an engineering professor. *College of Engineering New Faculty Orientation*, 17 August, University Park, Pennsylvania.
15. **Gayah, V.V.** (2012) Surviving the qualifying and oral exams. *UC Berkeley Graduate Student Assembly*, 18 April, Berkeley, California.
16. **Gayah, V.V.** (2012) Civil engineering career paths. *UC Berkeley American Society of Civil Engineers*, 12 April, Berkeley, California.

FUNDED PROJECTS

THE PENNSYLVANIA STATE UNIVERSITY

1. (PI) NCHRP Synthesis 20-05/Topic 54-10: State Customization of Highway Safety Manual Methods, *National Cooperative Highway Research Program*, April 2023 – March 2024, \$55,000. **[nationally competitive]**
2. (PSU PI) NCHRP Project 17-112: Enhancing Crash Modification Factors and Safety Performance Functions for Pedestrian and Bicyclist Countermeasures, *National Cooperative Highway Research Program (subcontract to Texas Transportation Institute)*, July 2023 – June 2025, \$600,000 (PSU amount – \$150,000). **[nationally competitive]**
3. (PSU PI) NCHRP Project 17-102: Safety performance for active transportation modes using exposure models, *National Cooperative Highway Research Program (subcontract to Texas Transportation Institute)*, July 2023 – June 2026, \$700,000 (PSU amount – \$170,000). **[nationally competitive]**
4. (co-PI) Safety effects of freeway rumble strips on crash severity, *Federal Highway Administration (subcontract to VHB, Inc.)*, October 2022 – February 2024, \$281,554 (PSU amount - \$128,453). **[nationally competitive]**
5. (PI) SCC-CIVIC-PG Track B: Novel shared transportation services to improve rural-urban commutes, *National Science Foundation*, October 2022 – March 2023, \$49,999. **[nationally competitive]**
6. (PI) Crash Modification Factors for high-tension cable median barriers, *Pennsylvania Department of Transportation (subcontract to Kittelson & Associates, Inc.)*, September 2022 – June 2023, \$94,806 (PSU amount - \$77,920).
7. (PI) Crash Modification Factors for high-friction surface treatments, *Pennsylvania Department of Transportation (subcontract to Kittelson & Associates, Inc.)*, September 2022 – June 2023, \$74,169 (PSU amount - \$55,388).
8. (co-PI) Behavioral safety in Pennsylvania, *Pennsylvania Department of Transportation*, July 2022 – June 2023, \$79,437.
9. (collaborating investigator) Socially responsible AI for Autonomous Vehicles, *Center for Socially Responsible Artificial Intelligence (CSR AI) Seed Funding*, May 2022 – April 2023, \$5,000.
10. (co-PI) Safety evaluation of sinusoidal centerline rumble strips, *Montana Department of Transportation*, January 2022 – June 2026, \$184,731. **[nationally competitive]**
11. (co-PI) Economic impacts of transportation infrastructure investments, *Pennsylvania Department of Transportation and Center for Integrated Asset Management for Multimodal Transportation Infrastructure Systems*, January 2022 – June 2023, \$197,882.
12. (co-PI) Quantifying the impact of data unavailability, inaccuracies and uncertainty on deterioration modeling and infrastructure asset management policies, *Pennsylvania Department of Transportation and Center for Integrated Asset Management for Multimodal Transportation Infrastructure Systems*, January 2022 – February 2024, \$251,090.
13. (PI) Crash Modification Factors for adaptive traffic signals update, *Pennsylvania Department of Transportation (subcontract to Kittelson & Associates, Inc.)*, September 2021– May 2022, \$48,132 (PSU amount - \$34,051).
14. (PI) On-demand Highway Safety Manual analysis and HSIP support, *Pennsylvania Department of Transportation (subcontract to Kittelson & Associates, Inc.)*, August 2021– June 2023, \$99,896 (PSU amount - \$6,000).
15. (co-PI) Development of Crash Modification Factors program: Focus crash and facility type workshops, *Federal Highway Administration (subcontract to VHB, Inc.)*, June 2021 – December 2021, \$59,630 (PSU amount – \$25,265). **[nationally competitive]**
16. (PI) Quantification of systemic risk factors for pedestrian safety on North Carolina roadways, *North Carolina Department of Transportation*, August 2021 – November 2022, \$166,328. **[nationally competitive]**
17. (PI) Collaborative research: Economic modeling and control methods for Next Generation carpool services, *National Science Foundation*, May 2021 – April 2025, \$200,309. **[nationally competitive]**
18. (PI) Interpretable machine learning methods for road crash frequency prediction, *Penn State Institute for Computational and Data Sciences Seed Grant*, May 2021 – December 2022, \$24,612.

19. (co-PI) Safe Integration of Autonomous Vehicles in Work Zones, *US Department of Transportation (subcontract to HNTB Corporation)*, January 2021 – December 2024, \$8,409,444 (PSU amount – \$1,479,408). **[nationally competitive]**
20. (PI) Network screening, *Pennsylvania Department of Transportation (subcontract to Kittelson & Associates, Inc.)*, October 2020 – June 2021, \$1,702,604 (PSU amount - \$19,911).
21. (co-PI) SMART Intersection multimodal safety countermeasure study, *Pennsylvania Department of Transportation (subcontract to Kittelson & Associates, Inc.)*, October 2020 – March 2022, approx. \$613,295 (PSU amount - \$63,300). **[ITSPA Project of the Year Award]**
22. (co-PI) Microsimulation of emergency evacuation of Bear Lake and Wild Basin in Rocky Mountain National Park, *National Park Service*, June 2020 – June 2021, \$45,300. **[nationally competitive]**
23. (co-PI) Optimization framework for infrastructure management considering traffic safety costs, *Center for Integrated Asset Management for Multimodal Transportation Infrastructure Systems*, June 2020 – November 2021, \$193,983 (PSU amount – \$96,983).
24. (PI) Update PennDOT Pub. 638A, *Pennsylvania Department of Transportation (subcontract to Kittelson & Associates, Inc.)*, April 2020 – December 2020, approx. \$123,000 (PSU amount - \$30,847).
25. (co-PI) AI-enabled fiscally constrained life-cycle asset management for infrastructure systems, *Center for Integrated Asset Management for Multimodal Transportation Infrastructure Systems*, January 2020 – May 2021, \$245,676 (PSU amount – \$122,838).
26. (co-PI) Southeastern Veterans Center Transportation Study, *Pennsylvania Department of Military and Veterans Affairs*, July 2019 – December 2019, \$20,721.
27. (PI) Adaptive signals crash modification factors, *Pennsylvania Department of Transportation*, May 2019 – March 2020, \$73,460.
28. (PI) Traffic signal control using reinforcement learning, *Institute for CyberScience Seed Grant*, May 2019 – December 2020, \$22,433.
29. (Collaborating Investigator) AI for identifying and optimizing interactions between transit systems, *Institute for CyberScience Seed Grant*, May 2019 – December 2020, \$24,993.
30. (PI) Pennsylvania traffic records integration plan, *Pennsylvania Department of Transportation*, September 2018 – July 2019, \$92,769.
31. (PSU co-PI) NCHRP Project 17-89: Safety performance of part-time shoulder use of freeways, *National Cooperative Highway Research Program (subcontract to Kittelson & Associates, Inc.)*, June 2018 – March 2021, \$400,000 (PSU amount – \$45,880). **[nationally competitive]**
32. (PI) CAREER: Multi-scale models of urban congestion dynamics to support advanced congestion management strategies, *National Science Foundation*, May 2018 – September 2024, \$500,000. **[nationally competitive]**
33. (co-PI) Regionalized urban/suburban collector road SPFs, *Pennsylvania Department of Transportation*, May 2018 – March 2019, \$71,434. **[AASHTO Sweet Sixteen Award]**
34. (co-PI) Crash data safety factors evaluation, *Pennsylvania Department of Transportation*, April 2017 – December 2017, \$73,563.
35. (PSU co-PI) NCHRP Project 17-84: Pedestrian and bicycle safety performance functions for the Highway Safety Manual, *National Cooperative Highway Research Program (subcontract to MRI Global, Inc.)*, March 2017 – February 2019, \$820,000 (PSU amount – \$183,321). **[nationally competitive]**
36. (co-PI) Financial benefits of proposed access management treatments, *South Dakota Department of Transportation (subcontract to South Dakota State University.)*, December 2016 – February 2021, \$99,982 (PSU amount – \$45,287). **[nationally competitive]**
37. (co-PI) Regionalized Safety Performance Functions, *Pennsylvania Department of Transportation*, March 2015 – December 2015, \$121,755.
38. (co-PI) Speed limits set lower than engineering recommendations, *Montana Department of Transportation*, September 2014 – August 2016, \$143,332. **[nationally competitive] [AASHTO High-Value Research Award]**
39. (PI) Establishing Crash Modification Factors and their use, *Pennsylvania Department of Transportation*, March 2014 – September 2014, \$74,801.

40. (Collaborating Investigator) A data-driven approach for Intelligent Transportation Systems, *IST Research Seed Grant*, January 2014 – May 2014, \$8,821.
41. (PI) Estimating uncertainty of bus arrival times and passenger occupancies, *US Department of Transportation via Mineta National Transit Research Consortium*, December 2013 – September 2015, \$133,115 (PSU amount – \$62,898).
42. (PI) How can we maximize efficiency and increase person occupancy at overcrowded park and rides, *Washington State Department of Transportation*, October 2013 – June 2014, \$147,513. **[nationally competitive]**
43. (co-PI) Safety performance functions for rural roads in Pennsylvania, *Pennsylvania Department of Transportation*, August 2013 – October 2014, \$499,936.
44. (Collaborating Investigator) Impacts assessment of dynamic speed harmonization with queue warning, *Federal Highway Association (subcontract to Kittelson & Associates, Inc.)*, June 2013 – March 2015, \$369,750 (PSU amount – \$4,382). **[nationally competitive]**
45. (Collaborating Investigator) An examination of active travel and economic behavior, *Social Science Research Institute at Penn State University*, July 2013 – December 2013, \$2,470.
46. (co-PI) Integration of multimodal transportation services, *US Department of Transportation via Mid-Atlantic Universities Transportation Center*, May 2013 – June 2015, \$153,301 (PSU amount – \$39,985).
47. (PI) Using mobile probes to inform and measure the effectiveness of macroscopic traffic control strategies on urban networks, *US Department of Transportation via Mid-Atlantic Universities Transportation Center*, August 2012 – June 2015, \$201,375 (PSU amount – \$90,435).

SELECTED PROJECTS SUPPORTED AT VANASSE HANGEN BRUSTLIN, INC. (VHB)

1. VMT prediction models to support macroscopic-level safety prediction tools, *Southern California Association of Governments*.
2. Development of planning-level safety prediction tools for interchanges, *Federal Highway Administration*.
3. Estimation of average daily traffic volumes using mobile probe data, *North Carolina Department of Transportation*.
4. NCHRP Project 17-89A HOV/HOT freeway crash prediction method for the Highway Safety Manual, *National Cooperative Highway Research Program*.
5. NCHRP Project 17-95 Crash Modification Factors (CMFs) for Intelligent Transportation System (ITS) applications, *National Cooperative Highway Research Program*.
6. NCHRP Project 17-81 Proposed macro-level safety planning analysis chapter for the Highway Safety Manual, *National Cooperative Highway Research Program*.
7. Data-driving models for safety measure baselines, *North Carolina Department of Transportation*.
8. Safety measure target setting for 2020, *Virginia Department of Transportation*.
9. NCHRP Project 17-93 Updating safety performance functions for data-driven safety analysis, *National Cooperative Highway Research Program*.
10. NCHRP Project 17-86 Estimating effectiveness of safety treatments in the absence of crash data, *National Cooperative Highway Research Program*.
11. Safety analysis needs assessment for transportation systems management and operations, *Federal Highway Administration*.
12. Developing new methods for safety measure target setting, *Virginia Department of Transportation*.

TEACHING EXPERIENCE AND EFFECTIVENESS

THE PENNSYLVANIA STATE UNIVERSITY

COURSES OFFERED

- | | |
|-------------|---|
| 1 offering | <p>CE 100S: First-Year Seminar
Freshmen-level undergraduate core course that introduces students to university study and fields of study related to engineering. Specifically, this course focuses on transportation engineering and its multi-disciplinary nature.</p> |
| 1 offering | <p>CE 321: Highway Engineering
Junior-level undergraduate core course that introduces the field of transportation engineering. Content includes vehicle performance characteristics, geometric design, pavement design, traffic flow principles and queuing theory, capacity and level of service analysis, and transportation planning. The 2-hour laboratory component covers many phases of the preliminary design process.</p> |
| 9 offerings | <p>CE 423: Traffic Operations
Senior-level undergraduate elective course that focuses on the engineering skills and techniques required to practice traffic engineering. Content includes an introduction to several key texts and references, such as the <i>Manual on Uniform Traffic Control Devices</i>, <i>Highway Capacity Manual</i> and <i>ITE Trip Generation Handbook</i>. The 2-hour laboratory component provides students with experience in field data collection and analysis.</p> |
| 4 offerings | <p>CE 522: Traffic Flow Theory and Simulation
Graduate course covers tools and methods to analyze empirical traffic data, advanced traffic flow theory concepts, and models of aggregate vehicular behavior on urban traffic networks.</p> |
| 6 offerings | <p>CE 525: Traffic Flow Theory / Transportation Operations
Graduate course covers basic tools used to describe transportation systems, properties and dynamics of traffic streams, and fundamentals of queuing, probability and statistics.</p> |
| 3 offerings | <p>CE 528: Transportation Safety Analysis
Graduate course covers overview of issues and methods in transportation safety analysis, including factors that most contribute to crash occurrence and injury severity outcomes, how transportation agencies plan to improve traffic safety, methods to determine crash causation, models that can be used to quantify safety performance of transportation infrastructure, methods to identify sites that may be suitable for treatment, and countermeasures that can be used to improve safety.</p> |
| 1 offering | <p>CE 597: Entering the Academic Job Market Seminar
Seminar course that seeks to prepare senior graduate students to apply for academic positions. The course covers duties of a TL professor, NTL options, paths to academia, the academic hiring process, application materials, interviewing and negotiating.</p> |
| 3 offerings | <p>CE 597: Transportation Engineering Graduate Student Seminar
Graduate seminar course that provides students with opportunities to present their research to colleague and provide feedback to student research presentations. Guest speakers from the local community, Penn State and other universities are also invited to share their research.</p> |
| 1 offering | <p>CE 597: Public Transportation Systems
Graduate course that covers the design, operation and management of public transportation systems. Topics include optimal design of fixed and flexible route systems, vehicle fleet and driver staffing requirements, and the stability of transit fleet operations.</p> |

EVIDENCE OF TEACHING EFFECTIVENESS

Semester	Course	Class size	Course quality (X/7.0)	Instructor quality (X/7.0)
SP 2023	CE 100S: First Year Seminar	35	7, 6	7, 7
FA 2022	CE 528: Transportation Safety Analysis	11	7, 7	7, 7
FA 2022	CE 423: Traffic Operations	21	7, 6	7, 7
SP 2022	CE 597: Entering the Academic Job Market Seminar	15	7, 7	7, 7
FA 2021	CE 525: Transportation Operations	12	7, 7	7, 7
FA 2021	CE 423: Traffic Operations	26	7, 6	7, 6
SP 2021	CE 596: Analysis of Transportation Demand	1	7, 7	7, 7
FA 2020	CE 423: Traffic Operations	29	7, 6	7, 7
FA 2020	CE 528: Transportation Safety Analysis	9	6.5, 7	7, 7
FA 2019	CE 423: Traffic Operations	22	6.31	6.69
FA 2019	CE 525: Transportation Operations	9	6.78	6.89
SP 2019	CE 528: Transportation Safety Analysis	6	6.50	6.75
FA 2018	CE 423: Traffic Operations	31	6.41	6.65
SP 2018	CE 522: Traffic Flow Theory and Simulation	5	6.80	7.00
FA 2017	CE 423: Traffic Operations	29	5.96	6.38
FA 2017	CE 525: Transportation Operations	6	7.00	7.00
SP 2017	CE 597: Transportation Engineering Graduate Student Seminar	11	6.64	6.73
SP 2017	CE 525: Transportation Operations	9	6.89	7.00
FA 2016	CE 321: Highway Engineering	60	5.69	6.33
SP 2016	CE 522: Traffic Flow Theory and Simulation	3	7.00	7.00
SP 2016	CE 597: Transportation Engineering Graduate Student Seminar	9	6.25	6.50
FA 2015	CE 423: Traffic Operations	21	6.24	6.76
FA 2015	CE 525: Transportation Operations	2	6.50	6.50
SP 2015	CE 522: Traffic Flow Theory and Simulation	7	6.71	6.86
FA 2014	CE 423: Traffic Operations	24	5.81	5.86
FA 2014	CE 525: Transportation Operations	11	6.09	6.18
SP 2014	CE 597: Public Transportation Systems	8	6.29	6.43
FA 2013	CE 423: Traffic Operations	24	5.88	6.46
SP 2013	CE 522: Traffic Flow Theory and Simulation	12	5.92	6.33
FA 2012	CE 525: Transportation Operations	12	5.82	5.91

FA: Fall semester; SP: Spring semester

* Fall 2020 and later, values represent mode and median, respectively

TEACHING GRANTS

1. Entering the Academic Job Market Seminar (development), Leonhard Center for Enhancement of Engineering Education, 2022.
2. Entering the Academic Job Market Seminar (pilot), Leonhard Center for Enhancement of Engineering Education, 2021.
3. CAVs: The future of transportation engineering education, Leonhard Center for Enhancement of Engineering Education, 2021.
4. Covering pre-requisite in engineering courses, Leonhard Center for Enhancement of Engineering Education, 2017.

TEACHING WORKSHOPS

1. (Selected participant) ProQual Research Incubator, National Science Foundation's Building Capacity in STEM Education Research, 2022.
2. (Selected participant) ProQual Institute for Research Methods, National Science Foundation's Building Capacity in STEM Education Research, 2021.
3. (Selected participant) Teaching and Learning Scholarship Academy: Grading Differently, Schreyer Institute for Teaching Excellence, 2021.
4. (Selected participant) Frontiers of Engineering Education (FOEE) Symposium, National Academy of Engineering, 2016.
5. (Selected participant) Creating and Ethical Classroom, Leonhard Center for Enhancement of Engineering Education, 2016.
6. (Invited participant) University Workshop on Teaching Intelligent Transportation Systems, US Department of Transportation and ITS America, 2014.
7. (Selected participant) How to Engineer Engineering Education, Project Catalyst, 2014.

UNIVERSITY OF CALIFORNIA, BERKELEY

GRADUATE STUDENT INSTRUCTOR

- | | |
|------------|---|
| 1 offering | CE 255: Highway Traffic Operations
Led 1-hour weekly discussion section; held office hours; graded all homework assignments and course projects; modified homework assignments and course projects |
| 1 offering | CE 258: Logistics Systems Analysis
Led 1-hour weekly discussion section; held office hours; graded all homework assignments and course projects |
| 1 offering | CE 259: Public Transportation Systems
Led 1-hour weekly discussion section; held office hours; graded all home assignments; created and modified homework assignments, course projects and comprehensive course notes (both published online; see Other Publications) |

ADVISING

POSTDOCTORAL SCHOLARS

- | | |
|-------------|---|
| 2022 – | Lissa Melis (PhD, University of Antwerp)
- Faculty member at Hasselt University (Belgium)
- Partnerships for Faculty Diversity Postdoctoral Fellowship Program
- Best presentation award, 2022 Annual Postdoctoral Research Symposium at Penn State
- Best poster award, 2022 Annual Postdoctoral Research Symposium at Penn State |
| 2021 – 2022 | Numan Ahmad (PhD, University of Tennessee)
- Faculty member at National University of Science and Technology (Pakistan) |
| 2021 – | Hao Liu (PhD, UT Austin) |
| 2019 – 2021 | Xuting Wang (PhD, UC Irvine)
- Faculty member at Southwest Jiaotong University (China) |

STUDENT ADVISEES

Graduate

in progress

Jakob Wiegand (PhD)

- Graduate Scholarship for Excellence in Engineering, Penn State College of Engineering (2022)

in progress

Xin Dong (PhD)

in progress

Tanveer Ahmed (PhD)

- College Student Scholarship, Mid-Atlantic Section of the Institute of Transportation Engineers (2023)
- James E. Marley Graduate Fellowship in Engineering, Penn State College of Engineering (2023)
- Leopard Family Eclipse Award for student leadership and service (2023)
- Penn State University Graduate Fellowship (2021)

in progress

Lin Lyu (PhD)

in progress

Pengxiang Zhang (PhD)

in progress

Dongqin Zhou (PhD)

- C. Norwood Wherry Memorial Graduate Fellowship in Engineering, College of Engineering (2023)
- Glenn E. Singley Memorial Graduate Fellowship in Engineering, Penn State College of Engineering (2022)
- Mark E. Alpert Fellowship, Department of Civil and Environmental Engineering at Penn State (2021)
- Leo Russell Fellowship for Outstanding Transportation Engineering Graduate Student at Penn State (2021)
- Penn State University Graduate Fellowship (2019)

2023

Tanveer Ahmed (PhD)

- 1st place presentation (Smart Systems Simulation and AI), College of Engineering Research Symposium (2023)
- 3rd place poster presentation, College of Engineering Research Symposium (2023)
- Penn State University Student Leadership Scholarship (2022)

2023

Asif Mahmud (PhD)

- Lifesavers Traffic Safety Scholar (2023)
- Clifford Speigelman Student Paper Award (Honorable Mention) - Transportation Statistics Interest Group of the American Statistical Association (2023)
- 2nd place presentation, College of Engineering Research Symposium (2022)
- Best presentation award, College of Engineering Research Symposium (2021)
- 3rd place presentation, Graduate Exhibition Award at Penn State University (2021)

2022

Zecheng Xiong (MS)

2022

Guanhao Xu (PhD)

- Leo Russell Fellowship for Outstanding Transportation Engineering Graduate Student at Penn State (2022)
- Best student presentation award, Transportation Engineering and Safety Conference (2019)

2022

Rebeka Yocum (PhD)

- **Faculty member at Oregon Institute of Technology**
- Graduate Scholarship for Excellence in Engineering, Penn State College of Engineering

- (2021)
 - Best presentation award, College of Engineering Research Symposium (2021)
 - Harold F. Martin Graduate Assistant Outstanding Teaching Award (2021)
 - FHWA Dwight D. Eisenhower Graduate Fellowship (2020)
 - Paul H. Schweitzer Memorial Graduate Fellowship, Penn State College of Engineering (2020)
 - Louis S. and Sara S. Michael Endowed Graduate Fellowship in Engineering, Penn State College of Engineering (2020)
 - Best student presentation award runner-up, Transportation Engineering and Safety Conference (2019)
 - Penn State University Graduate Fellowship (2018)
- 2022 **David Taglieri (MS/PSU Honors BS)**
 - Erickson Discovery Grant recipient, Penn State University (2021)
- 2022 **Ferdousy Runa (MS)**
- 2020 **Hang Jia (co-advisor, MS)**
- 2019 **Xiao Liang (co-advisor, PhD)**
 - Best student presentation award, Transportation Engineering and Safety Conference (2018)
 - Penn State Graduate Excellence Fellowship (2016)
- 2019 **Zhengyao Yu (PhD)**
 - Best student presentation award, Transportation Engineering and Safety Conference (2017)
 - Student Fellowship to attend the 22nd International Symposium of Transportation and Traffic Theory
 - Barnes Graduate Travel Scholarship (2017)
 - Leo Russell Fellowship for Outstanding Transportation Engineering Graduate Student at Penn State (2016)
 - Best presentation award, College of Engineering Research Symposium (2016)
- 2019 **Yinghai Yu (MS)**
- 2018 **Owen Hitchcock (MS)**
 - Leo Russell Fellowship for Outstanding Transportation Engineering Graduate Student at Penn State (2018)
 - Excellence student article competition winner, Urban Engineers (2018)
 - Best student presentation award, Transportation Engineering and Safety Conference (2016)
 - FHWA Dwight D. Eisenhower Graduate Fellowship (2016)
 - Civil Engineering Top in Class in Transportation Engineering (2016)
- 2016 **Anthony DePrator (MS)**
 - Civil Engineering Top in Class in Transportation Engineering (2015)
- 2016 **Xavier Harmony (MS)**
 - American Public Transportation Association (APTA) National Fellowship (2015)
- 2015 **Zhengyao Yu (MS)**
 - American Public Transportation Association (APTA) National Fellowship (2015)
 - Penn State Graduate Recruitment Fellowship (2014)
- 2015 **Chenxi Li (thesis reader/co-advisor, MS IE PSU)**
- 2015 **Xueyu (Shirley) Gao (PhD)**
- 2015 **Jan-Torben Girault (co-advisor, MS ETH Zurich)**
- 2015 **Jeffrey Gooch (co-advisor, MS)**
 - Leo Russell Fellowship for Outstanding Transportation Engineering Graduate Student at

- Penn State (2015)
- 2014 **Nicolas Muhlich (co-advisor, MS ETH Zurich)**
 - Culmann Fonds Award for Outstanding MS Thesis at ETH Zurich (2014)
- 2014 **Krae Stieffenhofer (MS)**
- 2014 **Andrew Nagle (MS)**
 - Mid- Atlantic Universities Transportation Center (MAUTC) Student of the Year Award (2015)
 - Leo Russell Fellowship for Outstanding Transportation Engineering Graduate Student at Penn State (2014)
 - FHWA Dwight D. Eisenhower Graduate Fellowship (2013)
- 2013 **William Roll (MEng)**

Undergraduate

- 2023 **Colin Rooney (Unfunded research)**
- 2023 **Kara Bailen (COE MC REU)**
- 2022 **Adam Evans (Unfunded research)**
- 2021 **Kaleb Knowles (COE MC REU)**
- 2020 **Sean Whiteman (COE Equity REU)**
- 2019 **Joshua Killian (Honors BS)**
 - Civil Engineering Top in Class in Transportation Engineering (2019)
- 2019 **Ikeoluwa Ogunranti (COE Equity REU)**
- 2019 **Sarah Adsit (COE REU)**
 - FHWA Dwight D. Eisenhower Graduate Fellowship (2020)
 - Dr. and Mrs. David and Shirley Wormley REU Scholarship recipient (2019)
- 2018 **Zacharia Sao (MC REU)**
- 2018 **Michael Willis (COE REU)**
- 2017 **Eric Siu (Unfunded research)**
- 2016 **David Rue (Unfunded research)**
- 2016 **Matthew Patterson (COE REU)**
- 2015 **Owen Hitchcock (COE REU)**
- 2015 **Ryan Anthony (Honors BS)**
- 2015 **Anthony DePrator (Unfunded research)**
- 2015 **Michael Barton (Unfunded research)**
 - American Public Transportation Association (APTA) National Fellowship (2014)
- 2013 **Jikun Lian (Unfunded research)**

GRADUATE COMMITTEE MEMBERSHIP

in progress	Abhishek Prajapati (PhD, CEE PSU)
in progress	Agnimitra Sengupta (PhD, CEE PSU)
in progress	Wushuang Bai (PhD, ME PSU)
in progress	Evan Pelletier (PhD, ME PSU)
in progress	Bachir Hamadeh (PhD, CEE PSU)
in progress	Qing Tang (PhD, CEE PSU)
in progress	Chris Yang Song (PhD, CEE PSU)
in progress	Shashank Vyas (PhD, ME PSU)
2023	Hongyu Guo (PhD, University of Canterbury)
2023	Mohammadhadi Mansourianfar (PhD, UNSW)
2023	Agnimitra Sengupta (MS, CEE PSU)
2023	Francios-Xavier Devailly (PhD, Data Science HEC Montreal)
2022	Muyang Lu (PhD, CEE PSU)
2022	Kareem Metwaly (PhD, EE PSU)
2022	Ayse Akyildiz (MS, RPTM PSU)
2022	Luis Delgado (MS, CEE PSU)
2021	Jean Doig (PhD, CEE UC Berkeley)
2021	Kasra Mokhtari (PhD, ME PSU)
2020	Manuel Jakob (PhD, ETH Zurich)
2020	Hua Wei (PhD, IST PSU)
2020	Dana Tobin (PhD, MAS PSU)
2020	Wenjing Song (PhD, IME PSU)
2020	Murat Bayrak (PhD, CEE PSU)
2020	Renato Guadamuz (MS, CEE PSU)
2019	Houjun Tang (PhD, CEE PSU)
2019	Susana Garcia-Gonzalez (PhD, CEE PSU)
2019	Kristin Kersavage (PhD, CEE PSU)
2019	Kan Wu (PhD, CEE PSU)
2018	Lingyu Li (PhD, CEE PSU)
2018	Xu Lin (MS, CEE PSU)
2017	Shakir Mahmud (MS, CEE Pitt)
2017	Xinyu Zhou (MS, CEE PSU)
2015	Mehmet Unal (PhD, CEE PSU)
2015	Shuaiqi Huang (MS, CEE PSU)
2015	Jon Crisafi (MS, CEE PSU)
2014	Kshitij Jerath (PhD, MNE PSU)
2014	Andrew Butsick (MS, CEE PSU)
2014	Philip Kulis (MS, CEE PSU)
2012	Seunghwan Shin (MS, CEE PSU)

SERVICE AND OUTREACH ACTIVITIES

UNIVERSITY SERVICE

2023—2025	Member, CEE Promotion and Tenure Committee
2022	Member, LTI Proposal and Grants Coordinator Search Committee
2022	Member, LTI Project Manager Search Committee

2022	Member , COE AC-14 Review
2021—	Member , CEE Diversity, Equity and Inclusion Committee
2021	Member , LTI Proposal Coordinator Search Committee
2020—2023	Member , Leonhard Center Faculty Advisory Board (College of Engineering)
2020—2021	Chair , College of Engineering Graduate Student Awards and Funding Committee
2020—2021	Chair , CEE Faculty Search Committee (Transportation Engineering)
2020—	Chair , CEE Faculty Mentoring Committee
2020—2024	Member , University Faculty Senate Intercollegiate Athletics Committee (2021-2022) Outreach Committee (2020-2021) COE Unit Communication Liaison (2021—present)
2019—2020	Member , CEE Faculty Workload Committee
2019, 2020	Coordinator , Mock CAREER panel review for College of Engineering
2018	Member , College of Engineering Capital Construction Plan Research Focus Group
2018—2022	Member , CEE Promotion and Tenure Committee
2018—	Area Coordinator , CEE Transportation Area
2018—2019	Member , CEE Advisory Committee
2018—2020	Member , CEE Faculty Mentoring Committee
2017—2018	Member , CEE Teaching Excellence Committee
2017—	Member , College of Engineering Activity Insights Users Committee
2017—2018	Member , CEE Department Seminar Committee
2016—2017	Member , College of Engineering Graduate Student Awards and Funding Committee
2015—2018	Organizer , annual Expanding Youth Horizons workshop for 6-8 grade females titled <i>Traffic Control Center Chaos</i>
2014—	Faculty advisor , ITE Student Chapter at Penn State
2014	Reviewer , College of Engineering REU proposals
2014—2015	Member , CEE Department Head Search Committee
2013—2018	Member , CEE Graduate Committee
2013, 2014, 2015, 2017, 2018	Reviewer/Poster Judge , College of Engineering Graduate Research Forum
2013	Participant , College of Engineering Strategic Planning Retreat
2013	Participant , STEM Fall Open House Dinner
2013	Poster Judge , University Graduate Exhibition
2012—2013	Member , CEE Undergraduate Committee

PROFESSIONAL SERVICE

2022—2023	Member , <i>9th International Conference on Vehicle Technology and Intelligent Transport Systems</i> International Program Committee
2022—	Paper Review Coordinator , Transportation Research Board <i>Safety Performance and Analysis</i> Committee (ACS50)
2022	Member , <i>2022 Traffic and Granular Flow</i> Conference International Scientific Committee
2022	Associate Editor , <i>IEEE Intelligent Vehicles Symposium</i>
2022	Session Chair , <i>101st Annual Meeting of the Transportation Research Board</i>
2021	Program Committee Member , International Workshop on Computational Transportation Science
2021—	Member , Transportation Research Board, <i>Access Management Committee (ACP60)</i>
2021—	Executive Committee Member , <i>Transportation Statistics Interest Section of the American</i> <i>Statistical Association</i>

- 2020— **Editorial Advisory Board Member**, *Accident Analysis and Prevention*
- 2020—2021 **Scientific Review Committee Member**, *International Road Safety and Simulation Conference*
- 2020—2021 **Review Editor**, *Frontiers in Future Transportation (Transportation Systems Modeling)*
- 2020 **Session Chair**, *99th Annual Meeting of the Transportation Research Board*
- 2020 **Associate Editor**, *IEEE Forum on Integrated and Sustainable Transportation System*
- 2019—2020 **Panel Member**, NCHRP Synthesis Project 51-06: State DOT Use of Vehicle Probe and Cellular GPS Data for Monitoring and Planning
- 2019— **Handling Editor**, *Transportation Research Record*
- 2019— **Committee Research Coordinator**, Transportation Research Board, *Traffic Flow Theory and Characteristics Committee (ACP50)*
- 2019 **Member**, *2019 Road Safety and Simulation Conference Scientific Review Committee*
- 2019— **Editorial Board Editor**, *Transportation Research Part B: Methodological*
- 2018— **Associate Editor**, *IEEE Intelligent Transportation Systems Conference*
- 2018— **Member**, *WCTRS Special Interest Group on Intelligent Transport Systems (C3)*
- 2017—2019 **Member**, *23rd International Symposium on Transportation and Traffic Theory Local Organizing Committee*
- 2017—2018 **Member**, *9th International Conference on Ambient Systems, Networks and Technologies Program Committee*
- 2017 **Session Chair**, *2017 Transportation Engineering Safety Conference*
- 2017 **Organizer**, Two Special Calls for Papers at *97th Annual Meeting of the Transportation Research Board*
- 2017 **Member**, *2017 Traffic and Granular Flow Conference International Scientific Committee*
- 2016 **Session Chair**, *2016 Transportation Engineering Safety Conference*
- 2016 **Organizer**, Two Special Call for Papers at *96th Annual Meeting of the Transportation Research Board*
- 2016— **Editorial Advisory Board Member**, *Transportation Research Part C: Emerging Technologies*
- 2016— **Associate Editor**, *IEEE Intelligent Transportation Systems Magazine (peer-reviewed journal)*
- 2016 **Session Chair**, *95th Annual Meeting of the Transportation Research Board*
- 2015— **Member**, *Transportation Engineering and Safety Conference Steering Committee*
- 2015—2017 **Member**, *22nd International Symposium on Transportation and Traffic Theory Local Organizing Committee*
- 2015—2016 **Member**, *19th EURO Working Group on Transport Scientific Review Committee*
- 2015 **Session Chair**, *2015 Road Safety and Simulation Conference*
- 2015— **Paper Review Coordinator**, Transportation Research Board *Traffic Flow Theory and Characteristics Committee (AHB 45)*
- 2015 **Member**, *2015 Traffic and Granular Flow Conference International Scientific Committee*
- 2015 **Organizer**, Special Call for Papers at *95th Annual Meeting of the Transportation Research Board*
- 2015 **Co-Organizer**, *Monitoring and Controlling Urban Transportation Networks: Theory and Application* workshop, Arlington, Virginia
- 2015 **Session Chair**, *94th Annual Meeting of the Transportation Research Board*
- 2014 **Member**, *Symposium Celebrating 50 Years of Traffic Flow Theory, Organizing Committee*
- 2014 **Session Chair**, *Symposium Celebrating 50 Years of Traffic Flow Theory*
- 2014—2019 **Editorial Advisory Board Member**, *Transportation Research Part B: Methodological*
- 2014 **Member**, *Centre Regional Bicycle Advisory Council*
- 2014 **Organizer**, Special Call for Papers at *94th Annual Meeting of the Transportation Research Board*
- 2013— **Member**, Transportation Research Board, *Traffic Flow Theory and Characteristics Committee (ACP50)*
- 2013—2014 **Member**, Institute of Transportation Engineers, *Transit Council Executive Committee*
- 2013 **Organizer**, Special Call for Papers at *93rd Annual Meeting of the Transportation Research Board*

- 2013 **Session Chair**, *Kuhmo NECTAR Conference on Transportation Economics*
 2013 **Session Chair**, *92nd Annual Meeting of the Transportation Research Board*
 2012, 2013 **Panelist**, *National Science Foundation*
 2012 **Session Chair**, *LATSIS—1st European Symposium on Quantitative Methods in Transportation Systems*
 2012—2018 **Member**, *Transportation Research Board Traffic Flow Theory and Characteristics Outreach and Diversity Subcommittee*

STUDENT SERVICE

- 2012 **Organizer**, Institute of Transportation Studies Friday Seminar Series
 2011—2012, **President**, UC Berkeley Transportation Student Organizing Committee
 2008—2010
 2010—2011 **Member**, 17th Annual University of California Transportation Center Conference Organizing Committee
 2009—2010 **Member**, UC Berkeley Civil and Environmental Engineering Department Curriculum Committee
 2007—2008 **Vice President**, UC Berkeley Transportation Student Organizing Committee
 2005—2006 **Member**, UCF President's Leadership Council
 2005—2006 **Secretary**, UCF College of Engineering and Computer Science Dean's Student Advisory Council
 2005—2006 **Vice President**, UCF ASHE Student Chapter
 2005 **Chair**, ASCE/AISC National Student Steel Bridge Competition Organizing Committee
 2004—2006 **Vice President**, UCF ASCE Student Chapter
 2004—2006 **Email Mentor**, UCF CEP HERO Undergraduate Outreach Program
 2001—2003 **Graduate**, UCF LEADS Scholars Program

JOURNAL REFEREE SERVICE

Accident Analysis and Prevention
 Advances in Transportation Studies
 ASCE Journal of Transportation Engineering, Part A: Systems
 Computer-Aided Civil and Infrastructure Engineering
 EURO Journal on Transportation and Logistics
 European Journal of Operations Research
 Frontiers in Future Transportation (Transportation Systems Modeling)
 IEEE Intelligent Transportation Systems Magazine [associate editor]
 IEEE Transactions on Intelligent Transportation Systems
 IET Intelligent Transport Systems
 Journal of Computational Design and Engineering
 Journal of Intelligent Transportation Systems
 Journal of Traffic and Transportation Engineering
 Networks and Spatial Economics
 Physica A: Statistical Mechanics and its Applications
 Public Transport: Planning and Operations
 Transportation
 Transportmetrica A: Transport Science
 Transportmetrica B: Traffic Dynamics
 Transportation Letters: An International Journal of Transportation Research
 Transportation Research Part B: Methodological [Editorial board editor]
 Transportation Research Part C: Emerging Technologies [Editorial board member]

Transportation Research Part E: Logistics and Transportation Review
Transportation Research Record: Journal of the Transportation Research Board

CONFERENCE REFEREE SERVICE

ASCE International Conference on Transportation and Development
European Working Group in Transportation
European Symposium on Quantitative Methods in Transportation
IEEE Conference on Intelligent Transportation Systems
International Symposium on Transportation and Traffic Theory
Road Safety and Simulation Conference
Traffic and Granular Flow Conference
Transportation Research Board
 Traffic Flow Theory and Characteristics Committee (AHB 45)
 Freeway Operations Committee (AHB20)
 Traffic Signal Systems Committee (AHB25)
 Transportation Network Modeling Committee (ADB30)
World Conference on Transportation Research

PROPOSAL AND OTHER REFEREE SERVICE

CUTC PhD Dissertation Award reviewer
CUTC MS Thesis Award reviewer
Mineta National Transit Research Consortium final report reviewer
Mountain Plains Consortium final report reviewer
National Science Foundation panel member
Swiss National Science Foundation proposal reviewer
University of California Transportation Center (UCConnect, formerly UCTC) proposal reviewer
University of Minnesota Roadway Safety Institute final report reviewer

TECHNICAL SKILLS

Computer	MS Office, Corel Word Perfect, LaTeX, Matlab, AutoCAD, CorelDraw, Adobe Creative Suite, PARAMICS, VISSIM, AIMSUN, CORSIM, SYNCHRO, SAS, Limdep, R, HCS+, CUBE, FSUTMS
Programming languages	C++, HTML, JAVA, Visual Basic, Matlab, Python, R

MEMBERSHIPS

Transportation Research Board Committees:

- 2019– Traffic Flow Theory and Characteristics, Committee Research Coordinator
- 2013– Traffic Flow Theory and Characteristics, Member
- 2012– Freeway Operations, Friend
- 2012– Transportation Signal Systems, Friend
- 2012– Transportation Network Modeling, Friend
- 2012– Highway Capacity and Quality of Service, Friend
- 2007– Institute of Transportation Engineers
- 2013– American Society of Civil Engineers
- 2012–2014 American Society of Engineering Education