

Curriculum Vitae

Gregory D. Erhardt, PhD, PE

Associate Professor
Department of Civil Engineering, University of Kentucky
261 Oliver H. Raymond Bldg., Lexington, KY 40506
859-323-4856, greg.erhardt@uky.edu

Education

University College London

Ph.D. Centre for Advanced Spatial Analysis, 2016

Thesis: *Fusion of Large Continuously Collected Data Sources: Understanding Travel Demand Trends and Measuring Transport Project Impacts* supervised by Michael Batty and Elsa Arcaute. Examined by Peter Jones and Andrew Daly.

Northwestern University

M.S. Civil Engineering – Transportation Systems Planning and Analysis, 2002

Thesis: *Modeling the Choice to Use Toll and High-Occupancy Vehicle Facilities* supervised by Frank Koppelman.

Cornell University

B.S. Civil and Environmental Engineering, Cum Laude, 2000

Professional Experience

Primary Appointments

2021- Associate Professor of Civil Engineering, University of Kentucky, Lexington, Kentucky

2016-2021 Assistant Professor of Civil Engineering, University of Kentucky, Lexington, Kentucky

2013-2016 Senior Analyst, RAND Europe, Cambridge, United Kingdom

2005-2013 Senior Transportation Modeler, Parsons Brinckerhoff, San Francisco, California

2002-2005 Transportation Modeler, Denver Regional Council of Governments, Denver, Colorado

2000 Traffic Engineer, S.R.F. & Associates, Rochester, New York

1998-1999 Travel Forecasting Intern, Parsons Brinckerhoff, Herndon, Virginia

Other Professional Appointments

2021-2022 Visiting Professor, School of Rural, Surveying and Geoinformatics Engineering, National Technical University of Athens, Greece.

2020- Associate Director, T-SCORE Center – A Tier 1 University Transportation Center

Professional Licenses

2017- Registered Professional Engineer, Kentucky License 32652

2005-2021 Registered Professional Engineer, Colorado License 39312

Publications

Peer Reviewed Journal Articles

Published or In-Press

1. **Erhardt, G.D., Hoque, J.M., Goyal, V.,** Berrebi, S., Brakewood, C., Watkins, K. (in-press) “Why has public transit ridership declined in the United States?” accepted for publication in *Transportation Research Part A: Policy and Practice*.
2. **Mucci, R.A., Erhardt, G.D.** (in-press) “Ride-Hail Data Suppression Strategies Can Lead to Biased Outcomes”, accepted for publication in *Transport Findings*.
3. Berrebi, S.J., Lind, E., Brakewood, C., **Erhardt, G.**, Watkins, K. (2022) “Investigating the Ridership Impact of New LRT and Arterial BRT Lines in the Twin Cities”, *Transportation Research Record*.

4. Sana, B., Zhang, X., Castiglione, J., Chen, M., **Erhardt, G.D.**, (2022) “Using Probe-Based Speed Data and Interactive Maps for Long-term and COVID-era Congestion Monitoring in San Francisco”, *Transportation Research Record*.
5. Ziedan, A., Darling, W., Brakewood, C., **Erhardt, G.**, Watkins, K. (2021) “The Impacts of Shared E-Scooters on Bus Ridership”, *Transportation Research Part A: Policy and Practice*, Vol 153.
6. Hoque, J.M., **Erhardt, G.D.**, Schmitt, D., Chen, M., Wachs, M., (2021) “Estimating the Uncertainty of Traffic Forecasts from Their Historical Accuracy”, *Transportation Research Part A: Policy and Practice*, Vol. 147.
7. Hoque, J.M., **Erhardt, G.D.**, Schmitt, D., Chen, M., Chaudhary, A., Wachs, M., Souleyrette, R. (2021) “The Changing Accuracy of Traffic Forecasts”, *Transportation*.
8. **Erhardt, G.D.**, Mucci, R.A., Cooper, D., Sana, B., Chen, M., Castiglione, J. (2021) “Do transportation network companies increase or decrease transit ridership? Empirical evidence from San Francisco”, *Transportation*.
9. Roy, S., Cooper, D., Mucci, R.A., Sana, B., Chen, M., Castiglione, J., **Erhardt, G.D.** (2020) “Why is Traffic Congestion Getting Worse? A Decomposition of the Contributors to Growing Congestion in San Francisco and Determining the Role of TNCs”, *Case Studies on Transport Policy*, Vol 8, No. 4.
10. **Erhardt, G.D.**, Roy, S., Cooper, D., Sana, B., Chen, M., Castiglione, J. (2019) “Do Transportation Network Companies Decrease or Increase Congestion?”, *Science Advances*, Vol 5, No. 5.
11. Francis, D., Tsang, F., **Erhardt, G.D.** (2019) “Estimating the Cost and Utility of Statewide Travel Models Using Scenario-Based Interviews”, *Transportation Research Record*, No. 2673.
12. Mucci, A. and **Erhardt, G.D.** (2018) “Evaluating the ability of transit direct ridership models to forecast medium-term ridership changes: Evidence from San Francisco”, *Transportation Research Record*, No. 2672.
13. **Erhardt, G.D.** (2017) “Conceptual Models of the Effect of Information and Communications Technology on Long-Distance Travel Demand”, *Transportation Research Record*, No. 2658.
14. **Erhardt, G.D.** (2016) “How Smart is Your Smart Card? Evaluating Transit Smart Card Data with Privacy Restrictions and Limited Penetration Rates”, *Transportation Research Record*, No. 2544.
15. **Erhardt, G.D.**, (2016) Patil, S., Light, T., Tsang, F., Burge, P., Sorenson, P, Zmud, M. “Understanding the Potential of Variable Tolling to Smooth Congestion on Downstream Facilities: Applications of a Joint Time-of-Day and Route Choice Model”, *Transportation Research Record*, No. 2563.
16. Hood, J., **Erhardt, G.**, Frazier, C., Schenk, A. (2014) “Estimating Emissions Benefits of Bicycle Facilities with Stand-Alone Software Tools”, *Transportation Research Record*, No. 2430. Selected from the 14th Transportation Planning Applications Conference Best Paper Presentations in Columbus, Ohio, May 2013.
17. **Erhardt, G.D.**, Freedman, J., Stryker, A., Fujioka, H., Anderson, R. (2007) “The Ohio Long Distance Travel Model”, *Transportation Research Record*, No. 2003.
18. **Erhardt, G.D.**, Kurth, D.L., Sabina, E.E., Myung, S. (2005) “Market-Based Framework for Forecasting Parking Cost in Traditional and Microsimulation Modeling Applications”, *Transportation Research Record*, No. 1921.
19. **Erhardt, G.D.**, Koppelman, F.S., Freedman, J., Davidson, W.A., Mullins, A. (2003) “Modeling the Choice to Use Toll and High-Occupancy Vehicle Facilities”, *Transportation Research Record*, No. 1854.

In-Review

1. Baker, C., Oluwashina, M., Max-Onakpoya, E., DeHart, J., **Erhardt, G.D.**, Grant, C. (in-review) “Strategically Placing Edge Nodes Leads to Tolerable Delay in Low-cost Smart Cities”, in-review by *Computer Communications*.
2. DeHart, J., Ajisegiri, O., Baker, C., **Erhardt, G.**, Cleveland, J., Grant, C. (in-review) “Who wants to be a Smart City? A Text Analysis of the Smart City Challenge Finalists”, in-review by the *International Journal on Advances in Intelligent Systems*.

Book Chapters

Refereed Full Chapter (Minimum of 2 Reviewers)

1. **Erhardt, G.D.**, Batty, M., Arcaute, E. (2018) “Recommendations for Big Data Archival Programs at Transportation Agencies”. In *Big Data for Urban and Regional Science*, edited by L.A. Schintler and Z. Chen, 292-303, Routledge.
2. **Erhardt, G.D.**, Lock, O., Arcaute, E., Batty, M. (2017) “A Big Data Mashing Tool for Measuring Transit System Performance”. In *Seeing Cities Through Big Data - Research, Methods and Applications in Urban Informatics*,

edited by V. Thakuria, N. Tilahun, and M. Zellner, 257–78. Springer Geography. Springer International Publishing.

Conference Proceedings

With Full Paper Review (Minimum of 2 Reviewers)

1. Lewis, D., Onar, O., **Erhardt, G.**, Zeng, R., Galigekere, V., Ozpineci, B., Gong, H., Ionel, D. (2022) “Sizing Considerations for Dynamic Wireless Charging Systems with Integrated Energy Storage”, accepted for presentation at the 2022 IEEE/AIAA Transportation Electrification Conference and Electric Aircraft Technologies Symposium (ITEC+EATS), Anaheim, California, June 2022.
2. Goyal, S.V., **Erhardt, G.D.**, Kressner, J., Berrebi, S., Brakewood, C., Watkins, K. (2022) “Simulating the Effect of Strategies to Increase Transit Ridership by Reallocating Bus Service”, poster presentation at the Transportation Research Board Annual Meeting, Washington, DC.
3. Ziedan, A., Darling, W., Brakewood, C., **Erhardt, G.**, Berrebi, S., Watkins, K. (2022) “The Impact of Fare Free Promotions on Bus Ridership in Topeka, Kansas” poster presentation at the Transportation Research Board Annual Meeting, Washington, DC.
4. Berrebi, S.J., **Erhardt, G.D.**, Watkins, K.E. (2022) “Is Bus Ridership Peaking? An Analysis of Pre-COVID Ridership and Service Frequency Trends by Time-Period” accepted for presentation at 15th International Conference on Advanced Systems in Public Transport (CASPT2021), Tel Aviv, Israel.
5. Madamori, O., Max-Onakpoya, E., **Erhardt, G.**, Baker, C.E. (2021) “A Latency-Defined Edge Node Placement Scheme for Opportunistic Smart Cities” Sixth IEEE International Workshop on Pervasive Context-Aware Smart Cities and Intelligent Transportation Systems (PerAwareCity), Kassel, Germany.
6. Madamori, O., Max-Onakpoya, E., **Erhardt, G.**, Baker, C.E. (2021) “Enabling Opportunistic Low-cost Smart Cities By Using Tactical Edge Node Placement” 16th IEEE/IFIP Wireless On-demand Network systems and Services Conference (WONS 2021), Online Conference, February 2021. Selected as a top paper at the conference.
7. Graehler, M., Mucci, R.A., **Erhardt, G.D.** (2019) “Understanding the Recent Transit Ridership Decline in Major US Cities: Service Cuts or Emerging Modes?” Proceedings of the 98th Transportation Research Board Annual Meeting, Washington, D.C.
8. Mucci, R.A., Sagar, S., **Erhardt, G.D.**, Stamatiadis, N. (2019) “Understanding Factors Influencing Small to Mid-City Bike Share Ridership: A Direct Ridership Analysis” Proceedings of the 98th Transportation Research Board Annual Meeting, Washington, D.C.
9. Castiglione, J., Roy, S., Cooper, D., Sana, B., Chen, M., **Erhardt, G.D.** (2019) “The Effect of Transportation Network Companies (TNCs) on Congestion in San Francisco”, Proceedings of the 98th Transportation Research Board Annual Meeting, Washington, D.C.
10. **Erhardt, G.D.**, Rizzo, L. (2018) “Evaluating the Biases and Sample Size Implications of Multi-Day GPS-Enabled Household Travel Surveys”, *Transportation Research Procedia*, No 32.
11. **Erhardt, G.D.**, Dennett, A. (2018) “Understanding the Role and Relevance of the Census in a Changing Transportation Data Landscape”, *Transportation Research Circular E-C233*, Transportation Research Board. Commissioned paper on Keeping the Census Data Relevant for the 2017 Transportation Research Board Conference on Applying Census Data for Transportation, Kansas City, Missouri.
12. **Erhardt, G.D.** (2012) “Evaluating Travel Markets in a Statewide Model”, Proceedings of the 91st Transportation Research Board Annual Meeting, Washington, D.C.
13. Sall, E., Bent, E., Koehler, J., Charlton, B., **Erhardt, G.** (2010) “Evaluating Regional Pricing Strategies in San Francisco: Application of the SFCTA Activity-Based Regional Pricing Model”, Proceedings of the 89th Transportation Research Board Annual Meeting, Washington, D.C. Selected from the 12th Transportation Planning Applications Conference Best Paper Presentations in Houston, Texas, May 2009.

With Abstract Review (Minimum of 2 Reviewers)

1. Lock, O., **Erhardt, G.D.**, (2015) “Keeping Track—The Fusion of Large, Automatically Collected Transport Data in Capturing Long-Term System Change”, Proceedings of the Australian Institute of Traffic Planning and Management (AITPM) National Traffic and Transport Conference, Brisbane, Australia.
2. **Erhardt, G.D.**, Sall, E.A., Zorn, L., Tischler, D., Alsup, R., Nassir, N. (2013) “Development and Application of a Dynamic Traffic Assignment Model for San Francisco”, presented at the 41st European Transport Conference, Frankfurt, Germany.

- Sabina, E.E., **Erhardt, G.D.**, Rossi, T.F., Coil, J. (2006) “Processing the Denver Travel Survey to Support Tour-Based Modeling: Methods, Data and Lessons Learned”, Proceedings of the Transportation Research Board Innovations in Travel Modeling Conference, Austin, Texas.

Research Reports

With Panel Review or External Peer Review

- Watkins, K.E., Berrebi, S., **Erhardt, G.**, Hoque, J., Goyal, V., Brakewood, C., Ziedan, A., Hemily, B., Kressner, J., (2022) *Recent Decline in Public Transportation Ridership: Analysis, Causes, Responses*, Transit Cooperative Research Program Research Report 231, Transportation Research Board, Washington, D.C.
- Erhardt, G.D.**, Schmitt, D., Hoque, J., Chaudhary, A., Rapolu, S., Kim, K., Weller, S., Sall, E., Chen, M., Souleyrette, R., Wachs, M. (2020), *Traffic Forecasting Accuracy Assessment Research*, National Cooperative Highway Research Program Report 934, Transportation Research Board, Washington, D.C.
- Zhang, X., Van Dyke, C., **Erhardt, G.**, Chen, M. (2019) *Practices on Acquiring Proprietary Data for Transportation Applications*, National Cooperative Highway Research Program Synthesis 541, Transportation Research Board, Washington, D.C.
- Erhardt, G.D.**, Tsang, F., Francis, D., (2018) *Assessing the Utility and Costs of Statewide Travel Demand Models*, National Cooperative Highway Research Program Project 8-36C, Task 137, Transportation Research Board, Washington, D.C.
- Rizzo, L., **Erhardt, G.D.**, (2016) *Sample Size Implications of Multi-Day GPS-Enabled Household Travel Surveys*, Research Results Digest 400, National Cooperative Highway Research Program, Transportation Research Board, Washington, D.C.
- Donnelly, R., **Erhardt, G.D.**, Moeckel, R., Davidson, W.A. (2010) “Advanced Practices in Travel Forecasting”, *NCHRP Synthesis 406*, National Cooperative Highway Research Program, Transportation Research Board, Washington, D.C.

Editorials

Without Formal Review

- Erhardt, G.D.** (2020) “A Perspective on Our Role as Transportation Modelers”. *The Right Path Newsletter*, International Professional Association for Transport & Health, March 2020.
- Akar, G. **Erhardt, G.D.**, (2018) “User Response to Autonomous Vehicles and Emerging Mobility Systems”. *Transportation*, No. 45, 1603.

Project Funding

Since joining UK, Dr. Erhardt has secured a total of \$3,341,000 in project funding as Principal Investigator or co-Principal Investigator. Dr. Erhardt had direct budgetary responsibility for \$1,234,000 of that total, with \$1,762,000 of the total contract value flowing to the University of Kentucky. Prior to joining UK, Dr. Erhardt secured an additional \$1,608,000 in project funding as Principal Investigator or Project Manager, with direct budgetary responsibility for \$1,468,000 of that amount.

ActivitySim Long-Distance Travel Model, <i>Ohio Department of Transportation</i> . PI with \$72,930 to UK.	\$252,149
ActivitySim Vehicle Type Model, <i>Association of Metropolitan Planning Organizations</i> . PI with \$7,741 to UK (2021).	\$79,541
Strategic Highway Investment for Tomorrow Uncertainty Analysis (SPR 22-622 Portion), <i>Kentucky Transportation Cabinet</i> . Co-PI responsible for \$15,352 with Souleyrette, Wang, Chen, Stromberg (2021).	\$209,988
Strategic Highway Investment for Tomorrow Project Scoring Improvement Tasks, <i>Kentucky Transportation Cabinet</i> . Co-PI responsible for \$158,673 (2021).	\$474,974
Performance Monitoring and Analysis Services, <i>San Francisco County Transportation Authority</i> . PI with \$29,000 to UK (2021)	\$80,000
Transit - Serving Communities Optimally, Responsively, and Efficiently (T-SCORE) Center, A Tier 1 University Transportation Center, <i>US Department of Transportation</i> . UK PI responsible for \$172,575 (2020).	\$1,000,000
Low-cost Smart Cities: Designing Affordable Smart Cities for All Communities, <i>National Science Foundation: Smart and Connected Communities Program</i> . Co-PI responsible for \$31,500 (2020).	\$150,000

Multi-day weighting methods research, Task Order 1 for California Metropolitan Planning Organization (MPO) Cooperative Household Travel Survey. UK PI responsible for \$5,600 (2019)	\$5,600
Performance Monitoring and Analysis Services, <i>San Francisco County Transportation Authority</i> . PI with \$49,908 to UK. (2019)	\$99,968
TCRP Project A-43: Recent Decline in Public Transportation Ridership: Analysis, Causes, Responses, <i>Transit Cooperative Research Program, Transportation Research Board</i> . UK PI responsible for \$91,576 (2018).	\$400,000
NCHRP Synthesis 20-05 Topic 49-14 Best Practices on Acquiring Non-Traditional Data for Transportation Applications, <i>National Cooperative Highway Research Program, Transportation Research Board</i> . Co-I responsible for \$5,000 (2017).	\$45,000
Understanding the Effects of TNCs in San Francisco, <i>San Francisco County Transportation Authority (SFCTA)</i> . PI (2017).	\$57,099
Understanding the Role and Relevance of the Census in a Changing Data Landscape, commissioned paper on the topic of “Keeping the ‘Census Data’ Relevant” for the 2017 Transportation Research Board Conference on Applying Census Data for Transportation, <i>American Association of State Highway and Transportation Officials</i> . Consulting (2017).	\$8,000
Ohio Statewide Model Validation, Task Order 1 of VAR-STW-Travel Demand Modeling 2017-1, <i>Ohio Department of Transportation</i> . UK PI (2017).	\$4,240
NCHRP Project 08-110: Traffic Forecasting Accuracy Assessment Research <i>National Cooperative Highway Research Program (NCHRP), Transportation Research Board</i> . PI (2016).	\$350,000
NCHRP Project 08-36C, Task 137: Assessing the Utility and Costs of Statewide Travel Demand Models, <i>National Cooperative Highway Research Program (NCHRP), Transportation Research Board</i> . PI (2016)	\$125,000
NCHRP Project 08-36C, Task 123: Survey Sample Size and Weighting, <i>National Cooperative Highway Research Program (NCHRP), Transportation Research Board</i> . Co-PI responsible for \$30,000 (2015).	\$100,000
NCHRP Project 08-36C, Task 135: Addressing Margins of Error in Small Areas of Data Delivered through the American Fact Finder or the Census Transportation Planning Products Program, <i>National Cooperative Highway Research Program (NCHRP), Transportation Research Board</i> . Co-I responsible for \$5,000 (2015).	\$75,000
Data Fusion Research Services”, <i>San Francisco County Transportation Authority</i> . PI (2013).	\$50,000
Monterey Bay Area Bicycle Travel Demand Modeling Project, Phase 2, <i>Association of Monterey Bay Area Governments</i> . Project Manager (2013).	\$125,000
On-Call Modeling and Technology Services, <i>San Francisco County Transportation Authority</i> . Project Manager for three task orders funded for \$46,624 (2013).	\$46,624
Maintain and Enhance Statewide Travel Demand Forecasting Model, <i>Ohio Department of Transportation</i> . Project Manager for two task orders funded for \$295,134 (2012).	\$295,134
On-Call Consulting Services for Transportation Model Re-Calibration, <i>Maricopa Association of Governments</i> . Project Manager for five task orders funded for \$220,110 (2011).	\$220,110
Monterey Bay Area Bicycle Travel Demand Modeling Project, <i>Association of Monterey Bay Area Governments</i> , Project Manager (2011).	\$90,000
Maintain and Enhance Statewide Travel Demand Forecasting Model, <i>Ohio Department of Transportation</i> . Project Manager for one task order funded for \$60,112 (2011).	\$60,112
On-Call Modeling and Technology Services,” <i>San Francisco County Transportation Authority</i> . Project Manager for six task orders funded for \$546,067 (2009).	\$546,067

Students Supervised

Ph.D. Students Advised

1. Goyal, Vedant. PhD Candidate. Dissertation Topic: “Implications of TNC Services on Road Safety Outcomes,” Expected Completion: December 2022.
2. Mucci, Alex. PhD Candidate. Dissertation Topic: “Transferrable Models of Ride-Hail Demand,” Expected completion: May 2023.
3. Hoque, Jawad. PhD Candidate. Dissertation Topic: “Accuracy and Uncertainty in Traffic and Transit Ridership Forecasts,” March 2022.
4. Roy, Sneha. Dissertation: “Quantifying the Impact of Transportation Network Companies (TNCs) on Traffic Congestion in San Francisco,” May 2019.

M.S. Thesis Students Advised

1. Imarah, Michelle. Lyman T. Johnson Fellow. Thesis Topic: “Effectiveness of Incentives and Policies on the Adoption of Electric Vehicles,” expected completion May 2023.
2. Ivanchak, Brandon. Thesis Topic: “Induced Travel Demand: Measuring the Contribution of Additional Lane Miles on the Increase in US Vehicle Miles Traveled from 1980 to 2019,” February 2022.
3. Hoque, Jawad. Thesis Topic: “Measuring and Improving the Accuracy of Project-Level Traffic Forecasts,” May 2019.
4. Mucci, Alex. Thesis: “TNCs and Transit Ridership: Influence of Transit Ridership Trends,” Co-supervised with Dr. Mei Chen, December 2017.
5. Lock, Oliver. Thesis: “The use of automatically-collected transport data in the spatiotemporal analysis and visualization of policy change: a case study of the San Francisco Municipal Railway,” University College London, M.Res. Advanced Spatial Analysis & Visualisation, August 2014.

M.S. Non-Thesis Students Advised

1. Francis, Danny. Independent Study Topic: “Estimating the Cost and Utility of Statewide Travel Models Using Scenario-Based Interviews,” December 2018.
2. Edmiston, Joseph. Advised Spring-Fall 2020.

Undergraduate Student Research Advised

1. Weber, Dean. Research evaluating rural public transportation needs, 2021-2022.
2. Williams, Eric. Research measuring project-level induced traffic demand, 2021-2022.
3. Greenway, Emily. Summer research evaluating the potential effect of climate migration on urban growth. Summer 2020.
4. Graehler, Michael. Summer research on the causes of recent transit ridership declines. Summer 2018.

High School Student Research Advised

1. Zhang, Ian. Research internship for the Math, Science and Technology Center at Dunbar High School on evaluating the uncertainty of transit ridership forecasts. 2020-2021.

PhD Committees

Abubakr Ziedan, 2023, University of Tennessee, Knoxville. Clarissa Livingston, 2023, ETH-Zurich. Shraddha Sagar, 2020, UK. Kiriakos Amiridis, 2018, UK.

MS Committees

Nathan Lant, 2021, Brigham Young University. Oluwashina Madamori, 2019 (Computer Science), UK. Fahmida Rahman, 2019, UK. Austin Obenauf, 2019, UK. Aaron Cambron, 2018, UK. Jacob Brashear, 2018, UK. Shraddha Sagar, 2017, UK. Kiriakos Amiridis, 2016, UK.

Teaching

Teaching Responsibilities

CE 331: Introduction to Transportation Engineering

2016-2021 (F)

An introduction to transportation engineering. Development of transportation systems in the United States. Route geometrics and design. Traffic flow characteristics and control. Planning, financing and economic analysis of transport facilities.

- CE 599: Data Science for Transportation 2017-2021 (S)
Introduces the practical skills needed to pursue data science both in the workplace and as a research student, taking applications from the transportation realm. Fundamentals of programming and data wrangling in Python, data visualization, applied statistical modelling and interpretation, identifying and perpetuating intellectually honest analysis.
- CE 699: The Science of Cities 2019-2021 (F)
This course covers contemporary research topics about cities, focusing largely on the transportation systems that form their backbone. In doing so, students will examine what it means to be an engineer, a scientist and a researcher, and practice the skills necessary to do so successfully.
- CE 699: Advanced Transportation Modeling 2018 (F)
Advanced methods and current research in transportation modeling, including activity-based modeling, dynamic traffic assignment, and Big Data analysis.
- National Highway Institute, Course 152054: Introduction to Urban Travel Demand Forecasting. 2008-2013
Parsons Brinckerhoff, Instructor for 3-day course on scripting in Cube software. 2012
Ohio Department of Transportation, Instructor for 5-day course in the Java programming. 2012
Ohio Department of Transportation, Instructor for 5-day course on travel model theory. 2007
Cornell Outdoor Education, Teambuilding and Wilderness Survival Instructor. 1997-2000

Service

Internal Committees

1. Department of Civil Engineering Diversity and Inclusion Committee (2020-), Chair (2021-)
2. Department of Civil Engineering Research Committee (2018-2019)
3. Joint College Committee Exploring Supply Chain Degree Development, College of Engineering and Gatton College (2018-2019)
4. Department of Civil Engineering Service Committee (2016-2018, 2019-2020)
5. Department of Civil Engineering Graduate Student Recruiting Team (2017)

External Committees

1. Transportation Planning Policy and Processes Committee (AEP10), Transportation Research Board of the National Academies (Member 2020-present)
2. Transportation Planning Applications Committee (ADB50), Transportation Research Board of the National Academies (Member 2019-2020)
3. Transportation Demand Forecasting Committee (ADB40, AEP50), Transportation Research Board of the National Academies (Member 2012-2021, Young Member 2006-2012)
4. Chair, Project Management Group for Open Science, Zephyr Foundation for Advancing Travel Analysis Methods (2018-2019)
5. Chan Wui & Yunyin Rising Star Workshop for Early Career Professionals in Transportation, Steering Committee (2017-2019)
6. Transportation Research Board Innovations in Travel Modeling Conference Planning Committee (ITM2020)
7. mobil.TUM 2018 - International Scientific Conference on Mobility and Transport, June 13th - 14th, 2018 in Munich, Germany, International Scientific Committee
8. Southern Data Science Conference (SDSC), Program Committee, Research Track (2017)

Editing

1. *Transportation*. Editorial Advisory Board (2019-present).
2. *Networks and Spatial Economics*. Guest Editor with Ke Han for Special Issue on “Intersections between Mobility and Communications” in conjunction with the Chan Wui & Yunyin Rising Star Workshop (expected publication Fall 2020).

3. *Transportation*. Guest Editor with Gulsah Akar for Special Issue on “User response to autonomous vehicles and emerging mobility systems” in partnership with the Transportation Research Board Committees on Travel Behavior and Values (ADB10) and Transportation Demand Forecasting (ADB40) (2018).

Anonymous Reviewer

Hong Kong Research Grants Council, Nature Communications, Proceedings of the National Academy of Sciences, International Journal of Sustainable Transportation, Journal of Public Transportation, Transportation Research Part A: Policy and Practice, Transportation Science, Transportation, Transportation Research Part C: Emerging Technologies, Journal of Transport Geography, Transport Policy, Journal of Urban Planning and Development, Transportation Research Record, Transportation Research Board Annual Meeting, Sustainable Cities and Society, Big Data for Urban and Regional Science, Innovations in Travel Modeling (ITM) Conference, European Transport Conference, University of California Los Angeles (UCLA) Institute of Transportation Studies, National Center for Sustainable Transportation (NCST), Council of University Transportation Centers (CUTC) Student Awards

Review Panels

1. Peer Review Panel for the San Francisco/Seattle Federal Highway Administration (FHWA) Strategic Highway Research Program 2 (SHRP2) C10 Fast-Trips Dynamic Transit Assignment Project (2017)
2. Tennessee Activity-Based Model Guideline Development Committee (2016)
3. Travel Model Improvement Program Peer Review Panelist for the Anchorage Metropolitan Area Transportation Study (2004)

Leadership

1. Co-lead, Travel Modeling as a Science Special Initiative, Transportation Demand Forecasting Committee (ADB40), Transportation Research Board of the National Academies (2016-2017).
2. Zephyr Foundation for Advancing Travel Analysis Methods, Instigator and Founding Stakeholder (2016-present)

Honors and Awards

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| 2018 | Certificate of Appreciation in recognition of leadership in advancing the science of travel demand modeling, Committee on Transportation Demand Forecasting (ADB40), Transportation Research Board |
| 2016 | Fellow, Chan Wui & Yunyin Rising Star Workshop for Early Career Professionals in Transportation |
| 2014 | Graduate Research Scholarship, University College London (~£40,000) |
| 2014 | Overseas Research Scholarship, University College London (~£24,000) |
| 2013 | Best Paper Presentation at the 14th Transportation Planning Applications Conference (Erhardt, et al. 2013) |
| 2013 | Best Paper Presentation at the 14th Transportation Planning Applications Conference (Hood, et al. 2014) |
| 2012 | Best Presentation at Futura 2012 (Clymer and Erhardt 2012) |
| 2011 | Best Presentation at Futura 2011 (Erhardt, et al. 2012) |
| 2009 | Best Paper Presentation at the 12th Transportation Planning Applications Conference (Sall, et al. 2010) |
| 2008 | Professional Associate, Parsons Brinckerhoff |
| 2000 | Walter P. Murphy Engineering Fellowship, Northwestern University (~\$37,000) |

For Students Supervised

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| 2022 | <u>Michelle Imarah</u> , Lyman T. Johnson Fellowship (~\$33,000 per year for stipend and tuition) |
| 2021 | <u>Jawad Hoque</u> , USEC Inc. Graduate Fellowship (\$5,000) |
| 2020 | <u>Jawad Hoque</u> , William (Bill) Seymour Transportation Engineering Scholarship (\$2,500) |
| 2019 | <u>Jawad Hoque</u> , 1 st Place Team, Southern District of the Institute of Transportation Engineers (SDITE) William H. Temple Traffic Bowl (\$3,000); 2 nd Place Team, Institute of Transportation Engineers National Traffic Bowl |
| 2018 | <u>Jawad Hoque</u> , 2 nd Place Team, Southern District of the Institute of Transportation Engineers (SDITE) William H. Temple Traffic Bowl |
| 2018 | <u>Sneha Roy</u> , 3 rd Place Student Poster Competition, Commonwealth Computational Summit |

- 2018 Sneha Roy, Kentucky Section of the Institute of Transportation Engineers (KYSITE) Scholarship (\$2,500)
- 2018 Sneha Roy, Lifesavers Traffic Safety Scholar (\$1,000)
- 2017 Alex Mucci, Dwight David Eisenhower Transportation Fellowship (\$5,000)
- 2017 Alex Mucci, 2nd Place, Three-Minute Thesis Competition, Southeast Transportation Center Student Spotlight

Presentations and Conference Participation

Excludes the presentation of papers listed in the publications or conference proceedings section.

Plenary Sessions

1. **Erhardt, G.D.**, “National, International and Independent Outlooks on Modelling (the new world)”, presentation at the opening plenary session of Modelling World International, online conference targeting Sydney, Auckland, Dubai, Delhi and London, April 2021.
2. **Erhardt, G.D.**, “Perspectives on Uncertainty”, presentation at closing plenary session of Modelling World, Birmingham, United Kingdom (online due to COVID-19), October 2020.
3. Schmitt, D., Hoque, J., Sall, E., **Erhardt, G.D.**, “Forecasting Accuracy: Implementing New Practices”, presented by David Schmitt, Jawad Hoque and Elizabeth Sall at the closing plenary session of the Transportation Research Board National Transportation Planning Applications Conference, Portland, Oregon, June 2019.
4. **Erhardt, G.** “Data and Methods Fusion in a New TDM Landscape”, interactive plenary panelist with J. Kressner and D. Ory, moderated by R. Donnelly, 7th International Conference on Innovations in Travel Modeling (ITM2018), Atlanta, Georgia, June 2018.

Conference Presentations: Lectern and Poster Sessions

1. Macfarlane, G., Atchley, H., Day, C., **Erhardt, G.**, Needell, Z. “Simulating and prioritizing service areas for regionally exclusive microtransit operations”, presented by Greg Macfarlane at mobil.TUM 2022 -- 12th International Conference on Mobility and Transport, Singapore (online due to COVID), April 2022.
2. Berrebi, S., Lind, E., Brakewood, C., **Erhardt, G.**, Watkins, K., (2021) “Investigating the ridership impact of new LRT and arterial BRT lines in the Twin Cities”, presented by Simon Berrebi at the World Symposium on Transport and Land Use Research (WSTLUR 2021), Portland, Oregon, August 2021.
3. Ziedan, A., Darling, W., Brakewood, C., **Erhardt, G.**, Watkins, K. “The impacts of shared e-scooters on bus ridership”, presented by Abubakr Ziedan at the 3rd Bridging Transportation Researchers Conference, online, August 2021.
4. Hoque, J.M., **Erhardt, G.D.**, Schmitt, D., Chen, M., Wachs, M. “A retrospective approach to quantifying uncertainty in traffic forecasts”, presented by Jawad Hoque at the 18th TRB Conference on Transportation Planning Applications, virtual event, June 2021.
5. Roy, S., **Erhardt, G.D.**, “Exploring the relationship between the emergence of Transportation Network Companies (TNCs) and growing congestion in San Francisco”, presented by Sneha Roy at the Workshop on Doctoral Research in Transportation Modeling, 98th Transportation Research Board Annual Meeting, Washington, D.C., January 2019.
6. Tsang, F., **Erhardt, G.D.** Francis, D. “Final Results from NCHRP Project 08-36 Task 137: Assessing the Utility and Costs of Statewide Travel Demand Models”, presented by Flavia Tsang at the annual meeting of the Critical Issues in Transportation Planning Subcommittee (ADA10(3)), 98th Transportation Research Board Annual Meeting, Washington, D.C., January 2019.
7. Hoque, J.M., **Erhardt, G.** “Quantifying the Inherent Uncertainty in Traffic Forecasts Using Quantile Regression Methods,” poster presented by Jawad Hoque at the Commonwealth Computational Summit, Lexington, Kentucky, October 2019.
8. Roy, S., Mucci, A., Brashear, J., Cooper, D., Sana, B., Tischler, D., Castiglione, J., **Erhardt, G.**, “Exploring the Relationship between the Emergence of Transportation Network Companies (TNCs) and Growing Congestion in San Francisco,” presented by Sneha Roy at the 7th International Conference on Innovations in Travel Modeling (ITM2018), Atlanta, Georgia, June 2018.
9. **Erhardt, G.**, Ory, D., Axhausen, K., Circella, G., Gao, S., Hess, S., Kressner, J., Mahmassani, H., Miller, E., Moeckel, R., Pozdnukov, A., Waddell, P., “Advancing TDM: Advancing Knowledge in a Generalizable and

- Testable Manner”, presented at a session on Advancing the Science of Transportation Demand Modeling, 97th Transportation Research Board Annual Meeting, Washington, D.C. , January 2018.
10. Daniels, C., Miller, E., Chatman, D., Circella, G., **Erhardt, G.**, Harb, M., Moeckel, R., Picado, R., Sall, E., Sivakumar, A., Weeks, J., “Advancing TDM: Strengthening Linkages with Policy and Planning”, presented by C. Daniels and E. Miller at a session on Advancing the Science of Transportation Demand Modeling, 97th Transportation Research Board Annual Meeting, Washington, D.C., January 2018.
 11. Roy, S., Cooper, D., Sana, B., Chen, M., Castiglione, J., **Erhardt, G.D.** “Quantifying the Impact of Transportation Network Companies on Traffic Congestion in San Francisco using Big Data”, poster presented by Sneha Roy at the Commonwealth Computational Summit, Lexington, Kentucky, June 2018. 3rd Place in Student Poster Competition.
 12. **Erhardt, G.D.**, “Subjecting Travel Forecasting to Rigorous, Scientific Testing”, oral presentation and panelist on Model Evaluation at the National Science Foundation Workshop on Advancing the Science of Transportation Demand Forecasting, Berkeley, California., April 2017.
 13. **Erhardt, G.D.**, Rizzo, L. “Sample Size Implications of Multi-Day GPS-Enabled Household Travel Surveys: An Overview of Research Results Digest 400”, oral presentation at the annual meeting of the Standing Committee on Travel Survey Methods (ABJ40), Transportation Research Board, Washington, D.C., January 2017.
 14. **Erhardt, G.D.** “Update on NCHRP Project 08-36 Task 137: Assessing the Utility and Costs of Statewide Travel Demand Models”, presented at the annual meeting of the Subcommittee on Statewide Modeling (Joint Subcommittee of ADA10 and ABD40), Transportation Research Board, Washington, D.C., January 2017.
 15. **Erhardt, G.D.**, "Fusion of Large Continuously Collected Data Sources: Understanding Travel Demand Trends and Measuring Transport Project Impacts", presented at the workshop on Doctoral Research in Transport Modeling and Traveler Behavior, 96th Transportation Research Board Annual Meeting, Washington, D.C., January 2017.
 16. **Erhardt, G.D.** “Using Continuously Collected Data for Travel Demand Trend Analysis”, presented at the Ohio Travel Demand Model Users Group”, Columbus, Ohio, June 2016.
 17. **Erhardt, G.D.** “Using Stated Preference Data and Choice Models to Measure the Impact of Time-of-Day Tolling”, presented at the Transport Modellers’ Forum, London, United Kingdom, January 2015.
 18. **Erhardt, G.D.** “Microsimulation in Activity-Based Travel Models: Motivation, Stochastic Variation and Opportunities”, presented at the Activity-Based Modelling and Appraisal Workshop, University of Hertfordshire, United Kingdom, April 2014.
 19. **Erhardt, G.**, Hood, J., Frazier, C., Schenk, A. “Using Smartphone Location Data to Estimate the Air Quality Benefits of Bicycle Infrastructure”, presented at the Seminars on Land Use, Transport Models and Big Data, The Martin Centre, University of Cambridge, Cambridge, United Kingdom, November 2013.
 20. **Erhardt, G.**, Weidner, T., Geraghty, F., Ship, B., Wood, H., Sawers, A., Deghani, Y. “Traffic and Revenue Forecasting for the Ohio Turnpike Asset Evaluation”, presented at the 14th Transportation Research Board National Transportation Planning Applications Conference, Columbus, Ohio, May 2013. Winner of a Best Paper Presentation Award.
 21. Moeckel, R., Giaimo, G., Jiang, Z., **Erhardt, G.**, Wood, H. “Analyzing Long-Distance Truck Travel for Freight Planning”, presented at the 14th Transportation Research Board National Transportation Planning Applications Conference, Columbus, Ohio, May 2013.
 22. Sall, E.A., **Erhardt, G.D.**, Zorn, L., Alsup, R., Tischler, D. “Modeling Every Hill, Bus, Traffic Signal and Car – How San Francisco Collaboratively Built a Citywide Dynamic Traffic Assignment Model”, presented by Ms. Sall at the 14th Transportation Research Board National Transportation Planning Applications Conference, Columbus, Ohio, May 2013.
 23. Zorn, L., Sall, E.A., Tischler, D., Alsup, R., **Erhardt, G.D.** “The Codebase IS the Deliverable: Collaborative Software Development for Modelers”, presented by Ms. Zorn at the 14th Transportation Research Board National Transportation Planning Applications Conference, Columbus, Ohio, May 2013.
 24. **Erhardt, G.D.**, Moeckel, R., Clymer C. “Ohio’s Stand-Alone Freight and Land Use Models”, presented at the Ohio Travel Demand Model Users Group”, Columbus, Ohio, March 2013.
 25. Clymer, C., **Erhardt, G.D.** “Implementing Statewide Land Use and Freight Models in Cube Script”, presented by C. Clymer at Futura 2012, Citilabs Annual International Users Conference, Palm Springs, California, November 2012. Winner of Best Presentation award.

26. **Erhardt, G.D.**, Moeckel, R. “Arizona Statewide Travel Demand Model”, webinar presented at the Arizona Model Users Group, Phoenix, Arizona, 2012.
27. **Erhardt, G.D.**, Ory, D., Sarvepalli, A., Freedman, J., Hood, J., Stabler, B. “MTC’s Travel Model One: Applications of an Activity-Based Model in its First Year”, paper presented at the 5th Transportation Research Board Innovations in Travel Modeling Conference, Tampa, Florida, May 2012. Originally presented at and winner of Best Presentation award at Futura 2011: Citilabs Annual International Users Conference, Palm Springs, California, November 2011.
28. **Erhardt, G.D.**, Moeckel, R., Williams, J. “Moving Travel Models to the Next Level”, paper presented at the 3rd Transportation Research Board Innovations in Travel Modeling Conference, Tempe, Arizona, May 2010.
29. Yennamani, R., Granato, S., Giaimo, G., **Erhardt, G.** “Semi-Automated Approach to Develop Focus Area Forecasts from a Statewide Model”, presented by Mr. Yennamani at the 12th Transportation Research Board National Transportation Planning Applications Conference, Houston, Texas, May 2009.
30. **Erhardt, G.D.**, Charlton, B., Freedman, J., Castiglione, J., Bradley, M., Linesch, N. “Modeling Congestion Pricing in San Francisco”, presented at the Ohio Travel Demand Model Users Group”, Columbus, Ohio, September 2008.
31. **Erhardt, G.D.**, Charlton, B., Castiglione, J., Freedman, J., Bradley, M. “Enhancement and Application of an Activity-Based Travel Model for Congestion Pricing”, paper presented at the Transportation Research Board Innovations in Travel Modeling Conference, Portland, Oregon, June 2008.
32. **Erhardt, G.D.**, Freedman, J. “Calibration and Application of the Ohio Long Distance Travel Model”, presented at the 11th Transportation Research Board National Transportation Planning Applications Conference, Daytona Beach, Florida, May 2007.
33. Picado, R., Freedman, J., Stryker, A., **Erhardt, G.D.**, Cohen, O. “The Ohio Short Distance Travel Model”, presented by Dr. Picado at the 11th Transportation Research Board National Transportation Planning Applications Conference, Daytona Beach, Florida, May 2007.

Conference Participation: Invited Speaker and Panelist

1. **Erhardt, G.** “Equity Considerations with Big Data in an Urban and Regional Transportation Planning Context”, discussant for Workshop 1023, Transportation Research Board Annual Meeting, January 2022.
2. Stone, D., Zook, M., **Erhardt, G.**, Talbert, J., “Big Data: Ethics, Resources and Potential Collaboration”, Vice President for Research Lunch and Learn Series, February 2021.
3. **Erhardt, G.**, “Do Revealed Preferences Tell us Much about our Travel Needs”, Problem Definition for Interactive Lectern Session 1125, Transportation Research Board Annual Meeting (online), January 2021.
4. **Erhardt, G.**, “Opportunities Using both Parallel and Fused Data Sources”, Panel on the Intersection of Survey and Passive Data, Zephyr Virtual Learning Sessions (online), September 2020.
5. Invited participant in the Transportation Research Board and Federal Highway Administration Emerging Trends Symposium on “Technology Opportunities for Regional Mobility,” Washington, D.C., November 2019.
6. Schmitt, D., **Erhardt, G.D.** “Interim Findings from NCHRP Project 8-110, Traffic Forecasting Accuracy”, speaker and interactive panelist at Workshop 1061 on “Progress in Improving Travel Forecasting Accuracy”, 98th Transportation Research Board Annual Meeting, Washington, D.C., January 2019.
7. **Erhardt, G.D.**, Castiglione, J. “Empirical Evidence from San Francisco”, speaker and interactive panelist at interactive session on “Do TNCs Increase or Decrease Congestion”, 98th Transportation Research Board Annual Meeting, Washington, D.C., January 2019.
8. **Erhardt, G.D.** “Advances in Surveys and Passive Data – Data Fusion”, speaker and interactive panelist at Workshop 1009 on “Big’ Solutions to ‘little’ Survey Problems: Travel Surveys, Passive Data, Visualization and More”, 98th Transportation Research Board Annual Meeting, Washington, D.C., January 2019.

Invited Seminars

1. **Erhardt, G.**, Buchheit, R., “Headwinds and Headways: Why has transit ridership declined in the US, and what can we do about it?”, presented at the Lexington Rotary Club, February 2021.
2. **Erhardt, G.D.**, Roy, S., Mucci, R.A., Chen, M., Cooper, D., Sana, B., Tischler, D., Castiglione, J., “Using Big Data to Quantify the Effect of TNCs on Transit Ridership and Congestion”, presented at the Alabama Transportation Institute Seminar Series, University of Alabama, November 2019.

3. **Erhardt, G.D., Roy, S., Mucci, R.A.,** Chen, M., Cooper, D., Sana, B., Tischler, D., Castiglione, J., “Do Transportation Network Companies Decrease or Increase Congestion”, presented at the Congestion Management Committee of the Lexington Area Metropolitan Planning Organization, August 2019.
4. **Erhardt, G.D., Roy, S., Mucci, R.A.,** Chen, M., Cooper, D., Sana, B., Tischler, D., Castiglione, J., “Measuring the Effect of Uber and Lyft on Transit Ridership and Traffic Congestion”, presented at the Louisville Metro Mobility Innovation Team Meeting, May 2019.
5. **Erhardt, G.D., Graehler, M. and Mucci, R.A.,** “Ride Hailing’s Impact on Transit Ridership”, presented at the Issues and Opportunities in Micro Transit and Public Transit Series, conference call with representatives of 22 North American transit agencies, February 2019.
6. **Erhardt, G.D.,** “Using Big Data to Quantify the Effect of TNCs on Transit Ridership and Congestion”, presented at the University of Toronto Transportation Research Institute (UTTRI) Seminar Series, Ontario, Canada, October 2018.
7. **Erhardt, G.D.,** “Measuring the effect of Uber and Lyft on traffic congestion and transit ridership”, presented at the Martin School of Public Policy Seminar Series, University of Kentucky, Lexington, Kentucky, September 2018.
8. **Erhardt, G.D.** “Activity-Based Travel Models and Big Data as Tools for Complementing and Extending UK Research Strengths”, presented at the Department of Civil Engineering, University of Kentucky, Lexington, Kentucky, November 2015.
9. **Erhardt, G.D.** “Back to the Data: From Data-Driven Travel Models to Theory-Driven Travel Models and Back”, presented at the Urban Big Data Centre, University of Glasgow, United Kingdom, June 2015.
10. **Erhardt, G.D.,** “An Overview of the Denver Region’s Ozone Early Action Compact”, presented at Metropolitan State University of Denver, Denver, Colorado, 2004.

Webinars

1. **Erhardt, G.D.,** Schmitt, D., **Hoque, J.,** Chen, M. “How Accurate are Traffic Forecasts?”, Transportation Research Board Webinar, October 2020.
2. **Erhardt, G., Hoque, J.,** Engelberg, D., Copperman, R., Weidner, T. “Prospective and Retrospective Views of Uncertainty in Travel Forecasting”, Zephyr Virtual Sessions (online), June 2020.

Workshops Organized and Sessions Chaired

1. Presiding Officer for Travel Demand Forecasting (ADB40) Poster Session, 98th Transportation Research Board Annual Meeting, Washington, D.C., January 2019.
2. Presiding Officer for Parallel Session TS1 “The True Theory of Modeling”, 7th International Conference on Innovations in Travel Modeling (ITM2018), Atlanta, Georgia, June 2018.
3. Sall, E., Ory, D., **Erhardt, G.,** Charlton, B., Walker, J. and Gardner, B. "From Ad-hoc to Organized: Writing the Roadmap for Improving Travel Analysis Methods", Workshop 162 at the 96th Transportation Research Board Annual Meeting, Washington, D.C., January 2017.
4. Presiding Officer for Session 591 “You Have a Choice: Choice Model Estimation” at the 89th Transportation Research Board Annual Meeting, Washington, D.C., January 2010.

Media

1. TCRP Project A-43 and other research covered by:
 - Lynch, Megan. “New Research Shows Ride Sharing Services Are Putting the Brakes on Mass Transit.” St. Louis, MO: *KMOX*, August 30, 2021.
 - Ovide, Shira. “What We Got Wrong About Uber and Lyft.” *The New York Times*, March 29, 2021
 - Watkins, David J. *Lawyers, Guns and Money Podcast*, April 2021.
2. Erhardt, **Mucci** et al 2021 was covered by:
 - Zipper, David. “Can Uber Help Save Public Transit?” *CityLab (Bloomberg)*, January 26, 2021.
3. NCHRP Report 934 (Erhardt et al 2020) was covered by:
 - Harrison, David. “Billions Spent on Roads and Transit Projects Are Often Based on Optimistic Forecasts.” *Wall Street Journal*, September 21, 2021.
 - Ewoldsen, Beth. “Forecasting through COVID-19 Will Be Crucial for the Future of Transportation | National Academies.” *TRB Blog (blog)*, May 26, 2020.
 - “TRB Looks at How Transportation May Change Due to COVID-19.” *AASHTO Journal*, May 29, 2020.

4. Erhardt, Roy et al 2019 has been covered in at least 128 news stories in multiple languages, including English, Spanish, French, German, Russian and others. This paper has an Altmetric Attention Score of 1511, putting it in the top 0.02% of all research outputs, #28 of all outputs from *Science Advances* and the top 100 articles of a similar age from any publication. Selected articles include:
 - Ira Flato. “A ‘Shared Ride’ May Be A Public Burden.” *NPR Science Friday*. May 10, 2019.
 - Crespi, Sarah, Meagan Cantwell, David Grimm. “Probing the Secrets of the Feline Mind and How Uber and Lyft May Be Making Traffic Worse.” *Science Podcast | AAAS*. May 9, 2019.
 - Sutherland, Mary Elizabeth. “Lyft and Uber Increase Congestion in San Francisco.” *Nature Human Behaviour*, June 2019.
 - Kenneth Cukier. “Uber Traffic: Are Ride-Hailing Apps Making Congestion Worse?” *Babbage from Economist Radio*, May 8, 2019.
 - Rosen, Julia. “Uber and Lyft Have Made San Francisco’s Traffic Much Worse, Study Says.” *Los Angeles Times*, May 8, 2019.
 - Mary Wisniewski, and Jennifer Smith Richards. “Uber and Lyft Said Ride-Sharing Would Cut Traffic Congestion and Supplement Public Transit. But Has It Worked?” *Chicago Tribune*, June 7, 2019.
 - Singh, Seema, and Olina Banerji. “From Uber in SF to Ola in Bengaluru: Ride-Sharing’s Hidden Secret.” *The Ken*, May 10, 2019.
 - Kennedy, Merrit. “Uber And Lyft Caused Major Traffic Uptick In San Francisco, Study Says.” *NPR*, May 8, 2019.
5. Dr. Erhardt’s research report *TNCs & Congestion* was covered in at least 31 news stories. Selected articles include:
 - Said, Carolyn. “Uber, Lyft Cars Clog SF Streets, Study Says.” *San Francisco Chronicle*, October 16, 2018, Front Page.
 - Fitzgerald Rodriguez, Joe. “Study: Half of SF’s Increase in Traffic Congestion Due to Uber, Lyft.” *The San Francisco Examiner*, Top News, October 16, 2018.
 - Brekke, Dan. “City Analysis: Uber, Lyft Are Biggest Contributors to Slowdown in S.F. Traffic.” *KQED News*, October 16, 2018, Top News.
 - Chronicle Editorial Board. “Editorial: Uber, Lyft Must Work with City to Ease Traffic Congestion.” *San Francisco Chronicle*, October 21, 2018.
 - Baldassari, Erin. “Uber, Lyft Responsible for Half of Growth in SF Traffic, Study Says.” *San Jose Mercury News*, October 16, 2018.
6. Graehler et al 2019 was covered in at least 23 news stories in multiple languages. Selected articles include:
 - Schmitt, Angie. “Study: Uber and Lyft Caused U.S. Transit Decline.” *Streetsblog USA*, January 22, 2019.
 - Bliss, Laura. 2019. “Another Study Blames Uber and Lyft for Public Transit’s Decline.” *CityLab (The Atlantic)*. January 24, 2019.
 - Millman, Zosha. 2019. “Seattle Is the Only City to Not See a Drop in Ridership. Here’s What Researchers Think.” *Seattle Post-Intelligencer*, January 30, 2019.
 - EFE. 2019. “Las Empresas Como Uber, Lyft o Cabify Reducen Hasta Un 1,7% El Uso Del Transporte Público | Expansión.” *Expansión (blog)*. January 26, 2019.
 - Redactie. 2019. “Studie: Uber Haalt Mensen Uit Het Ov | OV-Magazine.” *OV-Magazine (blog)*. February 5, 2019.
7. Dr. Erhardt’s participation in the Chan Wui & Yunyin Rising Star Workshop and organization of a follow-on workshop was covered by:
 - Musa, A., “Transportation ideas aim of UALR’s Italy trip,” *Arkansas Democrat Gazette*, September 18, 2017.
 - Kortum, K., “Exploring the Nexus of Mobility and Communications on an Ocean Crossing: The Chan Wui & Yunyin Rising Star Workshop,” *TR News* 307, Jan-Feb 2017.
8. Beyond the coverage of specific research outputs described above, Dr. Erhardt has been asked to comment to the media more broadly on issues related to ride-hailing, congestion and transit ridership and his research has been referenced in relation to related topics. Selected articles include:
 - Gordon, Aaron. “The Broken Algorithm That Poisoned American Transportation.” *Vice*, August 24, 2020.
 - Krusenklaus, Dave, Radio interview on the American Jobs Plan and the status of infrastructure in Kentucky, *WVTK*, April 13, 2021.
 - Patel, Khyati, “Kentucky gets C-minus on White House infrastructure report card”, *Spectrum News*, April 12, 2021.

- Ovide, Shira. "Tech Executives Aren't Fortune Tellers." *The New York Times*, March 11, 2021, sec. Technology (references to other news articles covering ride-hail research).
- Brown, Eliot. "The Ride-Hail Utopia That Got Stuck in Traffic." *Wall Street Journal*, front page of Technology section. February 15, 2020.
- Dungca, Nicole, Saurabh Datar, Rebecca Ostriker, Adam Vaccaro, and Andrew Ryan. 2019. "Seeing Red Part 3: Tech and Consequences. Companies like Uber, Lyft and Amazon intensify gridlock with little government pushback" *The Boston Globe*, part of the 3-part front-page "Seeing Red" series by *The Boston Globe Spotlight Team* November 21, 2019.
- The Economist*. "British Columbia Gives Uber a Cautious Go-Ahead," August 1, 2019.
- Willson, Miranda. "With Ride-Sharing Affecting Revenue, the RTC Explores New Solutions." *Las Vegas Sun*, January 31, 2020.
- Dobush, Grace. "Uber Has Troves of Data on How People Navigate Cities. Urban Planners Have Begged, Pleaded, and Gone to Court for Access. Will They Ever Get It?" *Marker*, September 9, 2019.
- Fitzgerald Rodriguez, Joe. "Uber and Lyft Traffic Impacts Double SF's Own Estimates." *The San Francisco Examiner*, August 5, 2019.
- Bliss, Laura. "A Post-Pandemic Reality Check for Transit Boosters." CityLab, May 6, 2020.
- Sparling, Hannah K. "COVID-19: Will Greater Cincinnati's Bus Systems Ever Recover from the Coronavirus Pandemic?" *The Cincinnati Enquirer*, June 25, 2020.
- Descant, Skip. "Report Stresses Transit Funding Needs Under Biden WH." *Government Technology Reports*, December 17, 2020.
- Hall, Blake. "Suburban sprawl and development do not help build more affordable housing." Op-Ed in *Lexington Herald-Leader*, December 18, 2020.

Policy

Policy Advice

The following efforts were conducted on a volunteer basis using personal time.

- 2021 Advisor to the San Francisco Municipal Transportation Authority on the development of the Automated Vehicle Local Operational Deployment Agenda (ALODA).
- 2021 Presentation to US Department of Transportation Office of Transportation Policy on traffic forecast accuracy and the implications for evaluating induced demand.
- 2020 Advisor to the California Governor's Office of Planning and Research on assessing induced travel resulting from roadway capacity increases.
- 2019 Technical advisor for the development of the Clean Miles Standard for transportation network companies (TNCs), California Air Resources Board

Policy Impact

The following are selected examples where Dr. Erhardt's research influenced policy decisions.

- 2019 Section 11205 of the Infrastructure Investment and Jobs Act directs the Secretary to compare travel demand forecasts with observed data to 1) evaluate the impacts of transportation investments, and 2) support more accurate forecasts. This section is aligned with the recommendations of NCHRP Report 934 (Erhardt et al 2020).
- 2018 A co-author presented *TNCs & Congestion* (SFCTA 2018) to the San Francisco Board of Supervisors sitting as the Transportation Commissioners. The chair, Supervisor Peskin, cited the report as the impetus to 1) lobby the state legislature for regulatory authority over TNCs, 2) seek voter approval for a TNC congestion mitigation tax, and 3) re-study the possibility of implementing congestion pricing.
- 2012 The Governor used the traffic and revenue analysis later reported in Erhardt et al 2013 (presentation) to select among financing options for the Ohio Turnpike, choosing to request \$1.5 billion in bonding authority against future toll revenue.
- 2011 The California Transportation Commission approves local authority for an additional 290 miles of express (high-occupancy/toll) lanes on the basis of forecasts prepared by Mr. Erhardt (Erhardt et al 2011)

presentation). The full network would be for 570 miles of express lanes constructed over 3 decades with revenue of \$4-6 billion.

2010 The San Francisco County Transportation Authority studies, but does not implement, congestion pricing using Mr. Erhardt's models (Sall et al 2010, Erhardt et al 2008). In 2018, The Authority resurrects the proposal in response to the *TNCs and Congestion* report (SFCTA 2018).

2004 Voters in the Denver region approve the \$4 billion FasTracks rapid transit expansion, with the program evaluation using models develop in part by Mr. Erhardt.