

Curriculum Vitae

Gregory D. Erhardt, PhD, PE

Assistant Professor
Department of Civil Engineering
University of Kentucky
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Research Interests

- ♦ Development and application of activity-based travel models.
- ♦ Application of passively collected data sources (“Big Data”) to travel forecasting.
- ♦ Ex-post evaluation of transportation projects.

Education

- 2016 **University College London**
Ph.D. Centre for Advanced Spatial Analysis
Thesis: Fusion of Large Continuously Collected Data Sources: Understanding Travel Demand Trends and Measuring Transport Project Impacts under the supervision of Professor Michael Batty and Dr. Elsa Arcaute. Examined by Professor Peter Jones and Professor Andrew Daly.
- 2002 **Northwestern University**
M.S. Civil Engineering – Transportation Systems Planning and Analysis
Thesis: Modeling the Choice to Use Toll and High-Occupancy Vehicle Facilities under the supervision of Professor Frank Koppelman.
- 2000 **Cornell University**
B.S. Civil and Environmental Engineering, Cum Laude

Honors and Awards

- 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)

Professional Registrations and Affiliations

- 2012- Transportation Research Board of the National Academies
Member of the Transportation Demand Forecasting Committee (ADB40)
- 2009- Transportation Research Board of the National Academies
Member of the Statewide Travel Demand Forecasting Subcommittee (ADA10(2))
- 2007-2012 Transportation Research Board of the National Academies
Young Member of the Transportation Demand Forecasting Committee (ADB40)
- 2005- Registered Professional Engineer, Colorado, License 39312

Professional Experience

- 2016- **Assistant Professor, Department of Civil Engineering, University of Kentucky**
Lexington, Kentucky

Research, teaching and service in transportation engineering, modeling and data science.
- 2013-2016 **Senior Analyst, RAND Europe**
Cambridge, United Kingdom

Conducted research focused on the quantitative evaluation of public policy and infrastructure investments related to transport systems.
- 2005-2013 **Senior Transportation Modeler, Parsons Brinckerhoff**
San Francisco, California

Developed and applied large-scale transportation models in locations throughout the U.S. using a broad range of methods, including traditional trip-based models, activity-based models, statewide models and dynamic traffic assignment models. Performed the first applications of several new models to study policy issues including major transit and highway projects, congestion pricing, express lanes, intercity rail, freight investments and bicycle lanes.
- 2002-2005 **Transportation Modeler, Denver Regional Council of Governments**
Denver, Colorado

Responsible for maintenance and application of travel forecasting model, including support for the regional transportation plan and FasTracks rapid transit build out.
- 2000 **Traffic Engineer, S.R.F. & Associates**
Rochester, New York

Estimated traffic from proposed land-use developments, performed intersection level-of-service analysis, recommended mitigation as warranted and documented findings.
- 1998-1999 **Travel Forecasting Intern, Parsons Brinckerhoff**
Herndon, Virginia

Processed household travel survey data, calculated trip generation rates, coded transportation networks, and applied travel demand models.

Publications and Conference Presentations

Peer Reviewed Journal Articles

- 2016 **Erhardt, G.D.** “How Smart is Your Smart Card? Evaluating Transit Smart Card Data with Privacy Restrictions and Limited Penetration Rates”, *Transportation Research Record*, No. 2544.
- 2016 **Erhardt, G.D.**, 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.
- 2014 Hood, J.*, **Erhardt, G.**, Frazier, C., Schenk, A. “Estimating Emissions Benefits of Bicycle Facilities with Stand-Alone Software Tools”, *Transportation Research Record*, No. 2430. ***mentee publication**
- 2007 **Erhardt, G.D.**, Freedman, J., Stryker, A., Fujioka, H., Anderson, R. “The Ohio Long Distance Travel Model”, *Transportation Research Record*, No. 2003.
- 2005 **Erhardt, G.D.**, Kurth, D.L., Sabina, E.E., Myung, S. “Market-Based Framework for Forecasting Parking Cost in Traditional and Microsimulation Modeling Applications”, *Transportation Research Record*, No. 1921.
- 2003 **Erhardt, G.D.**, Koppelman, F.S., Freedman, J., Davidson, W.A., Mullins, A. “Modeling the Choice to Use Toll and High-Occupancy Vehicle Facilities”, *Transportation Research Record*, No. 1854.

Peer Reviewed Book Chapters

- In-review **Erhardt, G.D.**, Batty, M., Arcaute, E. “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, Routledge, forthcoming.
- In-press **Erhardt, G.D.**, Lock, O., Arcaute, E., Batty, M. “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. Thakuriah, N. Tilahun, and M. Zellner, Springer, forthcoming.

Peer Reviewed Research Reports

- In-press Rizzo, L., **Erhardt, G.** “Sample Size Implications of Multi-Day GPS-Enabled Household Travel Surveys”, *NCHRP 8-36C Task 123*, National Cooperative Highway Research Program, Transportation Research Board of the National Academies, Washington, D.C.
- 2015 Light, T., Patil, S., **Erhardt, G.D.**, Tsang, F., Burge, P., Sorensen, P., Zmud, M. “The Impact of Adopting Time-of-Day Tolling: Case Study of 183A in Austin, Texas”, RAND Corporation, RR-969-CTRMA, Santa Monica, CA.
- 2010 Donnelly, R., **Erhardt, G.D.**, Moeckel, R., Davidson, W.A. “Advanced Practices in Travel Forecasting”, *NCHRP Synthesis 406*, National Cooperative Highway Research Program, Transportation Research Board of the National Academies, Washington, D.C.

Peer Reviewed Conference Papers

- 2014 Hood, J.*, **Erhardt, G.**, Frazier, C., Schenk, A. “Developing a Stand-Alone Bicycle Facility Emission Reduction Benefit Estimator: Incremental Nested Logit Analysis of Bicycle Trips in California’s Monterey Bay Area”, paper presented at the 93rd Transportation Research Board Annual Meeting, Washington, D.C. Selected from the 14th Transportation Planning Applications Conference Best Paper Presentations in Columbus, Ohio, May 2013. ***mentee publication**
- 2012 **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. Originally presented at and winner of Best Presentation award at Futura 2011: Citilabs Annual International Users Conference, Palm Springs, California.
- 2012 **Erhardt, G.D.** “Evaluating Travel Markets in a Statewide Model”, paper presented at the 91st Transportation Research Board Annual Meeting, Washington, D.C.
- 2010 **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.
- 2010 Sall, E., Bent, E., Koehler, J., Charlton, B., **Erhardt, G.** “Evaluating Regional Pricing Strategies in San Francisco: Application of the SFCTA Activity-Based Regional Pricing Model”, paper presented at 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.
- 2008 **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.
- 2006 Sabina, E.E., **Erhardt, G.D.**, Rossi, T.F., Coil, J. “Processing the Denver Travel Survey to Support Tour-Based Modeling: Methods, Data and Lessons Learned”, paper presented at the Transportation Research Board Innovations in Travel Modeling Conference, Austin, Texas.

Papers from Conferences with Abstract Review

- In-review Sall, E., Ory, D., **Erhardt, G.**, Charlton, B., Walker, J. “Zephyr’s First Year”, submitted as a workshop proposal to the 16th TRB National Transportation Planning Applications Conference, Raleigh, North Carolina.
- In-review Sall, E., Ory, D., **Erhardt, G.**, Charlton, B., Walker, J. "From Ad-hoc to Organized: Writing the Roadmap for Improving Travel Analysis Methods", submitted as a workshop proposal to the 96th Transportation Research Board Annual Meeting, Washington, D.C.
- In-review **Erhardt, G.D.**, "Fusion of Large Continuously Collected Data Sources: Understanding Travel Demand Trends and Measuring Transport Project Impacts", submitted to the workshop on Doctoral Research in Transport Modeling and Traveler Behavior, 96th Transportation Research Board Annual Meeting, Washington, D.C.
- 2015 Lock, O.*, **Erhardt, G.D.**, “Keeping Track—The Fusion of Large, Automatically Collected Transport Data in Capturing Long-Term System Change”, presented at the 2015 Australian Institute of Traffic Planning and Management (AITPM) National Traffic and Transport Conference, Brisbane, Australia. ***student publication**

- 2014 **Erhardt, G.D.**, Lock, O., Arcaute, E., Batty, M. “A Big Data Mashing Tool for Measuring Transit System Performance”, presented at the Workshop on Big Data and Urban Informatics, University of Illinois at Chicago, Chicago, Illinois.
- 2013 **Erhardt, G.D.**, Sall, E.A., Zorn, L., Tischler, D., Alsup, R., Nassir, N. “Development and Application of a Dynamic Traffic Assignment Model for San Francisco”, presented at the 41st European Transport Conference, Frankfurt, Germany.
- 2013 **Erhardt, G.**, Weidner, T., Geraghty, F., Ship, B., Wood, H., Sawers, A., Deghani, Y. “Traffic and Revenue Forecasting for the Ohio Turnpike Asset Evaluation”, paper presented at the 14th Transportation Research Board National Transportation Planning Applications Conference, Columbus, Ohio. Winner of a Best Paper Presentation Award.
- 2013 Moeckel, R., Giaimo, G., Jiang, Z., **Erhardt, G.**, Wood, H. “Analyzing Long-Distance Truck Travel for Statewide Freight Planning”, paper presented at the 14th Transportation Research Board National Transportation Planning Applications Conference, Columbus, Ohio.
- 2013 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”, paper presented at the 14th Transportation Research Board National Transportation Planning Applications Conference, Columbus, Ohio.
- 2013 Zorn, L., Sall, E.A., Tischler, D., Alsup, R., **Erhardt, G.D.** “The Codebase IS the Deliverable: Collaborative Software Development for Modelers”, paper presented at the 14th Transportation Research Board National Transportation Planning Applications Conference, Columbus, Ohio.
- 2009 Yennamani, R.*, Granato, S., Giaimo, G., **Erhardt, G.** “Semi-Automated Approach to Develop Focus Area Forecasts from a Statewide Model”, presented at the 12th Transportation Research Board National Transportation Planning Applications Conference, Houston, Texas.
***mentee publication**
- 2007 **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.
- 2007 Picado, R., Freedman, J., Stryker, A., **Erhardt, G.D.**, Cohen, O. “The Ohio Short Distance Travel Model”, presented at the 11th Transportation Research Board National Transportation Planning Applications Conference, Daytona Beach, Florida.

Invited Presentations

- 2016 **Erhardt, G.D.** “Using Continuously Collected Data for Travel Demand Trend Analysis”, presented at the Ohio Travel Demand Model Users Group”, Columbus, Ohio.
- 2015 **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.
- 2015 **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.
- 2015 **Erhardt, G.D.** “Looking Forward and Looking Back: Activity-Based Models and Data Fusion for Improved Travel Forecasts”, presented at the Department of Civil Engineering, University of Kentucky, Lexington, Kentucky.

- 2015 **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.
- 2014 **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.
- 2013 **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.
- 2013 **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.
- 2012 Clymer, C.*, **Erhardt, G.D.** “Implementing Statewide Land Use and Freight Models in Cube Script”, presented at Futura 2012, Citilabs Annual International Users Conference, Palm Springs, California. Winner of Best Presentation award. ***mentee publication**
- 2011 **Erhardt, G.D.**, Moeckel, R. “Arizona Statewide Travel Demand Model”, webinar presented at the Arizona Model Users Group, Phoenix, Arizona.
- 2008 **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.
- 2004 **Erhardt, G.D.**, “An Overview of the Denver Region’s Ozone Early Action Compact”, presented at Metropolitan State University of Denver, Denver, Colorado.

Students Supervised

- 2014 Oliver Lock
University College London, M.Res. Advanced Spatial Analysis & Visualisation
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*

Teaching

- 2016 Guest Speaker for WRD 204.003: Technical Writing
- 2016 CE 331: Introduction to Transportation Engineering
- 2008-2013 National Highway Institute, Instructor for Course 152054: Introduction to Urban Travel Demand Forecasting.
- 2012 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.
- 2007 Ohio Department of Transportation, Instructor for 5-day course on travel model theory.
- 1997-2000 Cornell Outdoor Education, Instructor for teambuilding and wilderness survival courses.

Service

- 2016- Founding Stakeholder of the Zephyr Foundation for Advancing Travel Analysis Methods

- 2016 Tennessee Activity-Based Model Guideline Development Committee
- 2015- European Transport Conference Transport Modelling Committee
10-20 abstract reviews per year.
- 2010- Transportation Research Board Innovations in Travel Modeling Conference
1-3 paper reviews per conference.
- 2010 Presiding Officer for Session 591 “You Have a Choice: Choice Model Estimation” at the 89th
Annual Meeting of the Transportation Research Board
- 2006- *Transportation Research Record* and Transportation Research Board Annual Meeting
6-10 paper reviews per year.
- 2004 Travel Model Improvement Program Peer Review Panelist for the Anchorage Metropolitan
Area Transportation Study

Project Funding Secured

- 2016 NCHRP Project 08-36C, Task 137: Assessing the Utility and Costs of Statewide Travel
Demand Models
Funding Agency: National Cooperative Highway Research Program (NCHRP),
Transportation Research Board
Role: Principal Investigator
Value: \$125,000
- 2015 SHRP2 Implementation Assistance and Technical Guidance and Support
Funding Agency: Federal Highway Administration via Metropolitan Transportation
Commission
Grant Program: Second Strategic Highway Research Program (SHRP2)
Implementation Assistance Program
Role: Consultant Project Manager and Key Staff
Value: up to \$50,000
- 2015 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
Funding Agency: National Cooperative Highway Research Program (NCHRP),
Transportation Research Board
Role: Consultant Project Manager and Key Staff
Value: \$75,000
- 2015 NCHRP Project 08-36C, Task 123: Survey Sample Size and Weighting
Funding Agency: National Cooperative Highway Research Program (NCHRP),
Transportation Research Board
Role: Co-Principal Investigator
Value: \$100,000
- 2013 Data Fusion Research Services
Funding Agency: San Francisco County Transportation Authority
Role: Principal Investigator
Value: \$50,000
- 2013 Monterey Bay Area Bicycle Travel Demand Modeling Project, Phase 2
Funding Agency: Association of Monterey Bay Area Governments
Role: Project Manager
Value: \$125,000

- 2012 On-Call Modeling and Technology Services
 Funding Agency: San Francisco County Transportation Authority
 Role: Project Manager
 Value: \$400,000
- 2012 Maintain and Enhance Statewide Travel Demand Forecasting Model
 Funding Agency: Ohio Department of Transportation
 Role: Project Manager
 Value: \$300,000
- 2011 On-Call Consulting Services for Transportation Model Re-Calibration
 Funding Agency: Maricopa Association of Governments
 Role: Project Manager
 Value: \$250,000
- 2011 Monterey Bay Area Bicycle Travel Demand Modeling Project
 Funding Agency: Association of Monterey Bay Area Governments
 Role: Project Manager
 Value: \$90,000
- 2010 Using Dynamic Traffic Assignment to Analyze Transit and Pricing Alternatives in a Dense, Urban Network
 Funding Agency: Federal Highway Administration
 Grant Program: Broad Agency Announcement for Transformational Changes and Revolutionary Advances for Transportation Planning
 Role: Consultant Project Manager
 Value: \$175,000
- 2010 Maintain and Enhance Statewide Travel Demand Forecasting Model
 Funding Agency: Ohio Department of Transportation
 Role: Project Manager
 Value: \$250,000
- 2009 On-Call Modeling and Technology Services
 Funding Agency: San Francisco County Transportation Authority
 Role: Project Manager
 Value: \$400,000