

Emerging Scholars Transportation Research Symposium

Friday, March 29, 2019

Doheny Memorial Library, Room 240

University of Southern California



Emerging Scholars Transportation Research Symposium

9.00 am Registration + Breakfast

9.30 am Welcome: Genevieve Giuliano, University of Southern California

Opening Address: Evelyn Blumenberg, University of California, Los Angeles

Successfully Navigating an Academic Career: Experiences and Lessons Learned

10 am Session 1: Transportation & Technology

Moderator: John Lower, Iteris

Analysis and Control of Traffic Flow on Signalized Arterial Networks

Pouyan Hosseini, Sonny Astani Department of Civil and Environmental Engineering, Viterbi School of Engineering, University of Southern California

Security Analysis for Current and Emerging Traffic Control Systems

Anthony Lopez, Department of Electrical Engineering and Computer Science, Samueli School of Engineering, University of California, Irvine

Traffic Implications of Deploying Self-driving Drayage Trucks: A Simulation Analysis of the I-710 in Southern California

Monica Ramirez Ibarra, Department of Civil and Environmental Engineering, Samueli School of Engineering, University of California, Irvine

Ghost Cars and Fake Obstacles: Automated Security Analysis of Emerging Smart Transportation Systems

Qi Alfred Chen, Department of Computer Science, Donald Bren School of Information and Computer Sciences, University of California, Irvine

Noon Lunch

Keynote Address: Martin Wachs, University of California, Los Angeles

Linking Research and Practice: Lessons Learned Over Five Decades

1 pm Session 2: Mobility & Transit

Moderator: Lisa Schweitzer, University of Southern California

Shifts in the rental housing landscape: Implications for Transit Access in Los Angeles, California

Tam J. Guy, Department of Urban Planning, Luskin School of Public Affairs, University of California, Los Angeles

Perceived Space of Urban Mobility: A Case Study in Ho Chi Minh City (Vietnam) using Travel Survey Data

Hue-Tam Webb Jamme, Department of Urban Planning and Spatial Analysis, Sol Price School of Public Policy, University of Southern California

The Homeless Bicyclist: Informal Mobility in California Cities

Cory Parker, Department of Human Ecology, Geography Graduate Group, University of California, Davis

Hidden Migrant Urbanism: Evidence from Shanghai

Julia Harten, Department of Urban Planning and Spatial Analysis, Sol Price School of Public Policy, University of Southern California

3 pm

Break

3:30 pm

Session 3: Transportation and Cities

Moderator: Jean-Daniel Saphores, UCI

In-depth Interviews with Heavy-duty Vehicle Fleet Operators: Building a Theory of Alternative Fuel Adoption Behavior in California

Youngeun Bae, Department of Civil and Environmental Engineering, Samueli School of Engineering, University of California, Irvine

Early-Life Exposures to Traffic-Related Air Pollutants Contribution to Childhood Obesity and Type 2 Diabetes

Zhanghua Chen, Department of Preventive Medicine, Keck School of Medicine, University of Southern California

Correcting Heterogeneous Externalities: Evidence from Local Fuel Price Controls

Cody Nehiba, Department of Economics, School of Social Sciences, University of California, Irvine

An Extension to Hybrid Proportional Online Cost Sharing Mechanism

Shichun Hu, Epstein Department of Industrial and Systems Engineering, Viterbi School of Engineering, University of Southern California

5:30 pm

Closing Address: Justine Johnson, Ford Smart Mobility

Closing Remarks: Genevieve Giuliano, University of Southern California

This event is brought to you by

Keynote Speakers



**Evelyn Blumenberg, Professor of Urban Planning
Department of Urban Planning, Luskin School of Public Affairs
University of California, Los Angeles**

Evelyn Blumenberg’s research examines the effects of urban structure—the spatial location of residents, employment, and services—on economic outcomes for low-wage workers, and on the role of planning and policy in shaping the spatial structure of cities. Her recent projects include analyses of trends in transit ridership, residential location and travel behavior of young adults, the relationship between automobile ownership and employment outcomes among the poor, and predatory auto lending. She was honored in 2014 as a White House Champion of Change for her research on the links between transportation access, employment, and poverty. She holds a bachelor’s degree in political science from UC Berkeley, and a master’s degree and Ph.D. in urban planning from the UCLA. She is currently a professor of Urban Planning in UCLA’s Luskin School of Public Affairs and directs the Lewis Center for Regional Policy Studies.



**Martin Wachs
Distinguished Professor Emeritus of Urban Planning
Department of Urban Planning, Luskin School of Public Affairs
University of California, Los Angeles**

Martin Wachs is a distinguished professor emeritus of urban planning at the UCLA Luskin School of Public Affairs and an expert on transportation policy and planning. He was a professor of civil and environmental engineering and professor of city and regional planning at UC Berkeley, where he also served as director of the Institute of Transportation Studies. Prior to this, he spent 25 years at UCLA, where he served three terms as chairman of the Department of Urban Planning. He retired as senior principal researcher and director of the Transportation, Space and Technology Program at the RAND Corporation. He is the author of 160 articles and four books on transportation, land use, and air quality; transportation systems; and the use of performance measurement in transportation planning. His research addresses issues of equity in transportation policy, problems of crime in public transit systems, and the response of transportation systems to natural disasters. His most recent work focuses on transportation finance in relation to planning and policy. His other areas of interest include professional ethics, transportation and aging, transportation and land use, transportation and the environment, transportation finance, and urban transportation planning.



Justine Johnson, Mobility Strategist, Ford Smart Mobility

Justine Johnson is mobility strategist at Ford Smart Mobility. She is working with municipalities and communities on mobility solutions that help move people and goods more efficiently and effectively throughout the region. This builds on the Ford unit’s goal of developing commercially-ready mobility services. For the past eight years, Johnson resided in New York City working on transportation initiatives under the Bloomberg and deBlasio Administrations. While at the New York City Taxi and Limousine Commission (TLC), she worked on the Green Taxi program, which created a new for-hire vehicle and driver classification. She moved from there to the New York City Economic Development Corporation, managing government and community relations for Mayor de Blasio’s new commuter ferry system, NYC Ferry. She is a graduate of the USC Price School, earning a dual Master of Planning/Master of Public Administration degree in 2010.

Moderators

John Lower
Associate Vice President
Iteris, Inc.



John Lower joined Iteris as Associate Vice President to contribute to both transportation systems and traffic sensors activities through business development and project execution. He leads Iteris activities in sustainable transportation activities and GHG reduction strategies in transportation. His previous 20 years were committed to the City of Anaheim, CA as Traffic and Transportation Manager. John elevated the City's ITS position to national prominence with completion of the first ITS Master Plan, and the conduct of a nationally significant Field Operational Test of Video Detection and Adaptive Traffic Signal Control. Such innovative transportation improvements and mobility enhancement served to benefit both neighborhood livability and major activity centers including the Disney Resort and major sports teams.

Lisa Schweitzer, Associate Professor
Department of Urban Planning and Spatial Analysis
Sol Price School of Public Policy
University of Southern California



Lisa Schweitzer is a Professor at the USC Sol Price School of Public Policy. She specializes in urban studies, and, in particular, analyses of social justice, environment, and transport. Her work has appeared in multiple popular and scholarly outlets, and her research has been funded by the National Science Foundation and the National Institute of Health. She received the Margarita McCoy Award from the Association of Collegiate Schools of Planning in 2016 for her contributions to advancing women in urban planning. She maintains a blog about sustainable urbanism at www.lisaschweitzer.com

Jean Daniel Saphores, Professor
Department of Civil and Environmental Engineering
Samueli School of Engineering
University of California, Irvine



Dr. Jean Daniel Saphores is a Professor in the Department of Civil and Environmental Engineering at the Samueli School of Engineering, University of California, Irvine. His research and teaching focus on transportation and environmental systems, which he analyzes using statistical and economic methods, combined with simulation and optimization tools. His active research interests include transportation and the environment (especially as it relates to air pollution and energy use), travel behavior analysis, alternative fuel vehicles, automated vehicles, transit use, sustainable infrastructure management, as well as decision making under uncertainty using real options.

Presenters



Youngeun Bae
PhD Candidate

**Department of Civil and Environmental Engineering
Samueli School of Engineering
University of California, Irvine**

Youngeun Bae is a PhD candidate majoring in transportation systems engineering at the University of California, Irvine. Her current research interests lie in sustainable freight systems, alternative fueled vehicles, advanced transit systems, and application of information technologies.

In-Depth Interviews with Heavy-duty Vehicle Fleet Operators: Building a Theory of Alt. Fuel Adoption in California
Revealing heavy-duty fleet operators' attitudes, preferences, and behavior towards alternative fuel vehicles (AFVs) is essential to understand the demand-side aspects of the heavy-duty AFV fleet sector. Such understanding can contribute to more facilitated diffusion of heavy-duty AFVs which can lead to the mitigation of climate change and improved local air quality. This study aims to build a theory of heavy-duty AFV fleet adoption behavior in California. First, an initial theoretical framework was developed based upon existing frameworks centering on organizational innovation adoption behavior and literature reviews. Next, a qualitative research approach is employed as an inductive strategy of building a theory informed by data. A stratified sample of heavy-duty AFV adopters and non-adopters in California came from the applicants of the Natural Gas Vehicle Incentive Project which is administered by the Institute of Transportation Studies at the University of California, Irvine. In-depth qualitative interviews are being conducted and the interview data analysis is in progress. As the outcome of this study, the finalized theoretical framework will contribute to a deeper understanding of heavy-duty AFV adoption behavior and help elicit demand-side policy measures to foster the transition towards zero-emission transportation.



**Zhanghua Chen, Assistant Professor, Dept. of Preventive Medicine
Keck School of Medicine, University of Southern California**

Zhanghua Chen is an Assistant Professor in the Environmental Health Division at the University of Southern California. She received her Bachelor in Clinical Medicine from Fudan University, China and PhD in Biostatistics from the USC. Chen is a biostatistician and environmental epidemiologist, whose research interests include the deleterious effects of air pollution and other early-life risk factors on metabolic, bone and respiratory diseases in children and adults; novel methods for molecular mechanisms including metabolomics and genomics; and global health. She is the PI of the NIEHS-supported K99/R00 Pathway to Independence Award: "Metabolomic Signatures Linking Air Pollution, Obesity and Diabetes". She has also published many papers in well-received medical journals and received wide media interest from Reuters and Xinhua News Agency.

Early-Life Exposures to Traffic-Related Air Pollutants Contribute to Childhood Obesity and Type 2 Diabetes
Evidence is mounting that air pollution exposures contribute to the rapidly growing obesity and type 2 diabetes epidemic by increasing risk across the lifespan. Long-term exposures to air pollutants, especially traffic-related air pollutants, increase the risk of childhood obesity and adversely affect glucose metabolism and insulin resistance in children and adults. Recent findings further suggest that another possible mechanism of air pollution exposure is through changes in food consumption patterns. Built upon longitudinal cohorts of children in the Children's Health Study (CHS), we found that increased early-life exposures to traffic-related air pollutants were associated with higher growth of body mass index (BMI). Moreover, our findings suggest that childhood exposures to traffic-related air pollutants are associated with increased consumption by adolescents of *trans* fat and fast foods. Recent metabolomics research further revealed the evidence that traffic-related air pollution exposures are associated with dysregulated fatty acid metabolism among CHS adolescents. In conclusion, exposures to traffic-related air pollutants, especially during early-life of childhood, could contribute to obesity and metabolic disorders in later life



Qi Alfred Chen, Assistant Professor
Department of Computer Science
Donald Bren School of Information and Computer Sciences
University of California, Irvine

Qi Alfred Chen is an Assistant Professor in the Department of Computer Science at the University of California, Irvine. His research interest is network and systems security, and the major research theme is addressing security challenges through systematic problem analysis and mitigation. His research has discovered and mitigated security problems in systems such as next-generation transportation systems, smartphone OSes, network protocols, DNS, GUI systems and access control systems. Currently, his focus has been in smart systems and IoT, including transportation and autonomous vehicle systems. His work has high impact in both academic and industry with over 10 top-tier conference papers, a DHS US-CERT alert, multiple CVEs, and over 50 news articles by major news media such as Fortune and BBC News. Chen received his Ph.D. from the University of Michigan in 2018.

Ghost Cars and Fake Obstacles: Automated Security Analysis of Emerging Smart Transportation System

Transportation systems today will soon be profoundly transformed due to two recent technology advances: Connected Vehicle (CV) and Autonomous Vehicle (AV). These transformation lead to the creation of a series of next-generation transportation systems such as smart traffic lights and self-driving cars, which can substantially improve the quality of our everyday life. However, they also bring new features and operation modes into the transportation ecosystem, e.g., network connectivity and machine learning based sensing, which may introduce new security problem and challenges. I performed the first security analysis of LiDAR-based object detection in AV systems. Many security problems were discovered, and strategies for defense were developed. The research leads to future directions in securing emerging CAV systems.



Tam J. Guy, PhD Candidate, Department of Urban Planning
Luskin School of Public Affairs
University of California, Los Angeles

Tam J. Guy is a doctoral student in Urban Planning at UCLA's Luskin School of Public Affairs. Tam explores how planners can and should create sustainable places for everyone by researching equity impacts at the intersection of transportation, housing, and green infrastructure. Tam earned his BSBA in management and leadership from Portland State University while working as an analyst at a securities litigation firm. He then completed dual masters degrees at the University of Utah in Business Administration (with emphases in strategy and innovation) and City + Metropolitan Planning (focused on smart growth, transportation, and urban design).

Shifts in the Rental Housing Landscape: Implications for Transit Access in Los Angeles, CA

Location matters to households for both housing and transportation decisions. For households who need or prefer to use transit, proximity to a robust transit network is a high priority. In this research, I identified shifts across and within the six-county region overseen by the Southern California Association of Governments in the locations of rental housing units for three cost brackets, then identified the associated shifts in transit accessibility for low-cost rental housing units. I conclude that housing and transportation policies need to be revisited based on the finding that low-cost housing units shifted to areas with lower transit accessibility to jobs.



Julia Gabriele Harten, PhD Candidate
Department of Urban Planning and Spatial Analysis
Sol Price School of Public Policy, University of Southern California

Before taking up doctoral studies, Julia Gabriele Harten studied at the University of Münster, Goethe University Frankfurt, and Free University Berlin, earning degrees in business administration, economics, and China studies. She has working experiences inside and outside academia in Germany, China, Taiwan, Mexico, and the United States. Her research employs a trans-disciplinary approach that synergizes ethnography with the opportunities of critical digital data analysis. She is interested in leveraging new methods and data sources to study the hidden urbanism of those for whom cities did not plan and often refuse to plan: migrants.

Crowded with Potential: Bed Space Rentals in Urban China

China's planned mega-cities house hidden, informal residential markets. To hide in the formal built environment means crowding. This presentation documents Shanghai's group rentals market, in which commercial and residential units have been illegally converted into extremely crowded dormitories and rent is charged by the bed. To analyze this market in terms of target population, pricing of crowding levels, gender, and amenities, we collected more than 33,000 online classified ads.

When we ground-truthed this data with fieldwork, we found systematic misrepresentation and collected a second set of "real" market data for comparative analysis. We find that Shanghai's group rental market targets young, educated migrants who trade-off crowded, informal living conditions for short commutes to employment opportunities in the central city. While many imagine migrants as laborers, contemporary urbanization has widened the bounds of marginalization: many renters are recent college graduates. We also analyze the limits and potential of web-scraped data. Comparing hedonic regression results across data sets, we find that both reveal the importance of location, the rational pricing of crowding, and differences in gender-based crowding. We also find that actual rents are on average 24% higher and locations are generally farther away from the city center than advertised. This paper highlights how little is known about the variety of (Chinese) migrant housing needs in relation to their livelihoods. It also evidences the need for greater critical thinking when working with new data streams and is a call to interrogate what this data actually can and cannot represent, as well as what and who is missing.



Pouyan Hosseini, PhD Candidate
Department of Civil and Environmental Engineering
Viterbi School of Engineering, University of Southern California

Hosseini's research is on analysis and control of traffic flow on urban traffic systems, and on developing optimization tools to improve the performance of signalized arterial networks. He has been developing distributed algorithms for adaptive traffic signal control inspired by scheduling algorithms from data networks. His work also includes evaluating performance of adaptive controllers through extensive microscopic traffic simulations. Pouyan obtained his Master's degree from Ming Hsieh Department of Electrical Engineering at USC, his Bachelor's from the University of Tehran. He received the CTF Heckerorth Scholarship. He has served as technical reviewer for TRR Journal, Automatica Journal, American Control Conference and IFAC Symposium on Control in Transportation Systems.

Analysis and Control of Traffic Flow on Signalized Arterial Networks

A novel signal performance measure (SPM) is proposed for urban traffic networks, where the performance of a given traffic signal timing plan is evaluated using a *plug-and-play* macroscopic model. We consider traffic flow dynamics for a network of signalized intersections; outflow from every link is constrained to be equal to a given capacity function if the queue length is positive, and equal to the minimum of cumulative inflow and capacity function otherwise. We provide a framework to obtain queue length trajectories, and the proposed iterative algorithm converges uniformly monotonically to the desired periodic orbit. We evaluate the fidelity of proposed model by comparing it with the output of a microscopic traffic simulator. In the second part of this study, we propose control techniques for signalized arterial networks inspired by scheduling algorithms from data networks. We study the throughput of arterial network under specific type of adaptive controllers and traditional fixed-time controllers. This comparison is done both in terms of theoretical upper bounds and the empirical values obtained from microscopic traffic simulations.



Shichun Hu, PhD Candidate
Epstein Department of Industrial and Systems Engineering
Viterbi School of Engineering
University of Southern California

Shichun Hu is a PhD student in Industrial and System Engineering at University of Southern California. She is advised by Professor Maged Dessouky and her research interests are primarily vehicle routing, ride-share and supply chain optimization.

An Extension to Hybrid Proportional Online Cost Sharing Mechanism

The problem we study in this report focuses on routing in real time a fleet of capacity constrained vehicles to satisfy requests submitted by a set of customers while assigning the service cost fairly among the requested customers. During each operation, only a subset of the customers request service; some of the requests are known at the beginning of the operation and the rest arrive dynamically during the day. The exact time points of these dynamic requests are unknown at the beginning of the day. We propose a Hybrid Proportional Online Cost Sharing (HPOCS) mechanism to tackle the cost sharing problem and analyze its performance using simulation instances. Although HPOCS does satisfy the desirable properties, namely online fairness, budget balance, immediate response, individual rationality and ex-post incentive compatibility, it has certain drawbacks when the number of dynamic customers is small, and it does not give sufficient incentive for customers to request early. Therefore, we make two extensions to HPOCS: 1) we extend it to introduce the idea of discounts to encourage customers to submit their request in advance to better facilitate efficient vehicle routing; 2) we extend it to incorporate a dynamic vehicle routing framework that periodically re-optimizes the current vehicle routes. Both extensions include performance analysis and the trade-off between the performance and the loss of certain desirable properties. In general, our proposed mechanism, along with its extensions can generate efficient cost sharing solutions that satisfy desirable properties, and reduce overall operating cost (mainly vehicle miles travelled).



Monica Ramirez Ibarra, PhD Candidate
Department of Civil and Environmental Engineering
Samueli School of Engineering
University of California, Irvine

Monica Ramirez Ibarra is a Transportation Systems Engineering PhD student in the Institute of Transportation Studies at the University of California, Irvine. Her research interests include transportation modeling, transportation planning, and environmental justice.

Traffic Implications of Deploying Self-Driving Drayage Trucks: A Simulation Analysis of the I-710 in Southern California

What are the potential traffic benefits of deploying autonomous heavy-duty trucks (HDTs) in a busy freight corridor? This presentation starts answering this question for drayage trucks that operate on the road network between the ports of Los Angeles/Long Beach and downtown Los Angeles. We evaluate system performance changes associated with the deployment of autonomous HDTs by performing 24-hour microscopic traffic simulations of various scenarios defined by different levels of port operation levels and different levels of autonomous technology adoption. We rely on TransModeler 5.0 because it allows approximating the behavior of autonomous HDTs by implementing Cooperative Adaptive Cruise Control and the Constant Time Gap Car-Following Model. Results suggest that replacing current drayage trucks with autonomous HDTs coupled with the addition of one lane in each direction and selected ramp improvements could help accommodate a 90% increase in drayage trucks traffic in our study area, which is forecasted for the year 2035 traffic control system.



Huê-Tâm Webb Jamme, PhD Candidate
Department of Urban Planning and Spatial Analysis
Sol Price School of Public Policy
University of Southern California

Huê-Tâm Webb Jamme is a doctoral student in Urban Planning and Development at the USC Sol Price School of Public Policy. In her dissertation on "mobility development," she builds on a case study in Ho Chi Minh City to explore the social, political, and spatial implications of urban transportation planning in a rapidly developing context. Huê-Tâm holds a master's degree from Science Po Rennes, France.

**Urban Mobility Practices and Everyday Uses of the City:
A Case Study in Ho Chi Minh City (Vietnam) Using Travel Survey Data**

This presentation brings unique evidence of the extent to which individual mobility practices shape everyday uses of the city in a rapidly developing context. Travel survey data was collected from a representative sample of Ho Chi Minh City's population in 2014. Regression results indicate that the dominant form of mobility today, i.e. motorbike mobility, is most conducive to discretionary activities rich in social interactions and economic transactions. Such findings raise policy issues regarding the broad range of urban, social, and structural transformations to be expected from the on-going mobility transition from motorbikes to cars and/or transit.



Anthony Lopez, PhD Candidate
Department of Electrical Engineering and Computer Science
Samueli School of Engineering, University of California, Irvine

Anthony Lopez is an Electrical Engineering and Computer Science (EECS) PhD graduate student researcher at the University of California - Irvine. He works under Professor Mohammad Al Faruque in the Advanced Integrated Cyber-Physical Systems (AICPS) lab. His primary research interests involve the analysis and improvement of security of automotive and transportation Cyber-Physical Systems. For his determination and commitment to tackling challenges in research, he has received a number of fellowship awards, including the NSF Bridge to Doctorate Fellowship and the NSF Graduate Student Research Fellowship (GRFP).

Security Analysis for Current and Emerging Traffic Control Systems

Wireless communication is being used as an enabling technology with traditional fixed traffic control systems in this transitional era toward Intelligent Transportation Systems (ITS). Unfortunately, major security concerns have arisen with respect to ever-increasing complexity and interconnectivity, and a noticeable lack of attention for security in these systems. Addressing concerns is a colossal challenge as it requires thorough development and formal analysis of a system model with respect to security. To tackle this challenge, we present a novel formal attack modeling and impact analysis methodology based on the Link Queue Model (LQM) of traffic flow inside a double ring road network, which is equivalent to a grid network with homogeneous links. We develop attack models as functions of tampered traffic control settings (e.g., green time ratios, cycle length, retaining ratios) with outputs equivalent to mobility impacts on the traffic network (e.g., time until system reaches state convergence, asymptotic average network flow). Further, for a given attack model, we define and identify vulnerable states: states that are critical to protect because they lead to negative impacts under the given attack model. Using our methodology we found that for certain vulnerable states, after only a few cycles of tampered control settings an attacker could cause a real impact of 1.5x speed-up in gridlock state convergence or 37%-99% drop in the asymptotic ave. flow rate.



**Cody Nehiba, PhD Candidate, Department of Economics
School of Social Sciences, University of California, Irvine**

Cody Nehiba is a PhD candidate in the Department of Economics at the University of California, Irvine. He specializes in environmental, public, and urban economics focusing on two related topics, regulating negative externalities and fossil fuel taxation. His work combines massive untapped data sets and novel identification strategies to extend our understanding of the regulation and consumption of externality producing goods.

Correcting Heterogeneous Externalities: Evidence from Local Fuel Price Controls

When demand elasticities for or damages from the consumption of externality producing goods vary across agents, firms, or geographies, uniform policy instruments are an inefficient tool for correcting market failures. This paper examines how a policy instrument that reflects this heterogeneity can improve efficiency by comparing the welfare effects of a uniform fuel taxation regime to county fuel taxes set using local information by estimating county-specific travel demand elasticities and congestion damages. Because travel demand elasticities, congestion damages, and pollution damages exhibit significant heterogeneity across regions, county-specific fuel taxes, levied in only a small subset of large metropolitan areas, provide welfare gains valued between \$7.10 and \$25.84 per capita annually relative to a revenue neutral \$0.10 per gallon uniform fuel tax increase. In addition to being more efficient, it is shown that a more targeted fuel tax regime is less regressive than the current uniform regime.



**Cory Parker, PhD Candidate
Department of Human Ecology, Geography Graduate Group
University of California, Davis**

Cory Parker practiced landscape architecture of public infrastructure for 15 years, primarily working on large transportation and park projects. For the U.S. 93 Highway Redesign in Montana, he worked with teams of engineers to design 57 wildlife crossings through the Flathead Indian Reservation. At the University of California, Davis, Cory researches homeless mobility in California cities. His work assesses homeless modes of transportation through an innovative, mobile ethnography. In 2018, he submitted articles based on this research to the *Journal of Transportation Geography* and the *International Journal of Urban and Regional Research*.

The Homeless Bicyclist: Informal Mobility in California Cities

People experiencing homelessness struggle to move through the city, given the expense of owning and operating an automobile. The spatial extent of automobile use and infrastructure contributes to transportation exclusion. In response, the urban poor develop their own means of informal transportation in the public streets and open space of the city. How do homeless people use the bicycle in California cities? Does the bicycle improve (or detract from) accessibility? And what policies affect this accessibility? Using a mobile ethnography in the urban landscape, I observed and interacted with homeless people and their movements in neighborhoods they frequent. Analysis of field notes and mappings shows people experiencing homelessness find an adaptable mode of transportation in the bicycle, more responsive than transit and reaching larger areas than walking. Informal movement patterns run counter to the public policies (even pro-bicycle policies) designed to enhance transportation, make cities safer and boost local economies.

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