

Geoff Boeing

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EDUCATION

- Ph.D. City and Regional Planning, University of California, Berkeley, 2017
Dissertation: *Methods and Measures for Analyzing Complex Street Networks and Urban Form*
Committee: Paul Waddell (chair), Robert Cervero, Elizabeth Macdonald, David O'Sullivan
- M.S. Information Management, Arizona State University, 2006
- B.S. Computer Information Systems *summa cum laude*, Arizona State University, 2004

ACADEMIC APPOINTMENTS

- 2018– Assistant Professor, School of Public Policy and Urban Affairs
Affiliate Faculty, Network Science Institute
Northeastern University (starting Fall 2018)
- 2017–18 Postdoctoral Scholar, Department of City and Regional Planning
University of California, Berkeley

RESEARCH AND TEACHING INTERESTS

Urban planning and informatics

Urban form, including history and theories of form, design, and street networks

Urban data science: computational statistics, machine learning, big data, visualization, spatial analysis

Complex systems: complexity theories of cities, systems thinking, network science

PUBLICATIONS

Peer-Reviewed Journal Articles

- 2018 Boeing, G. "A Multi-Scale Analysis of 27,000 Urban Street Networks." *Environment and Planning B: Urban Analytics and City Science*, in press.
- 2018 Boeing, G. "Pynamical: Model and Visualize Discrete Nonlinear Dynamical Systems, Chaos, and Fractals." *Journal of Open Source Education*, in press.
- 2017 Boeing, G. "OSMnx: New Methods for Acquiring, Constructing, Analyzing, and Visualizing Complex Street Networks." *Computers, Environment and Urban Systems* 65, 126–139.

- 2017 Boeing, G. and P. Waddell. "New Insights into Rental Housing Markets across the United States: Web Scraping and Analyzing Craigslist Rental Listings." *Journal of Planning Education and Research* 37 (4), 457–476.
- 2017 Boeing, G. "OSMnx: A Python Package to Work with Graph-Theoretic OpenStreetMap Street Networks." *Journal of Open Source Software* 2 (12), 1.
- 2016 Boeing, G. "Honolulu Rail Transit: International Lessons from Barcelona in Linking Urban Form, Design, and Transportation." *Planext* 2, 28–47.
- 2016 Boeing, G. "Visual Analysis of Nonlinear Dynamical Systems: Chaos, Fractals, Self-Similarity, and the Limits of Prediction." *Systems* 4 (4), 37.
- 2014 Boeing, G., D. Church, H. Hubbard, J. Mickens, and L. Rudis. "LEED-ND and Livability Revisited." *Berkeley Planning Journal* 27 (1), 31–55.

Journal Article Manuscripts Under Review

- 2018 Boeing, G. "Planarity and Street Network Representation in Urban Form Analysis." Revise and resubmit at *Environment and Planning B: Urban Analytics and City Science*.
- 2018 Boeing, G. "Methods for Measuring the Complexity of Urban Form and Design." Revise and resubmit at *Urban Design International*.
- 2018 Boeing, G. "Online Rental Housing Market Representation and the Digital Reproduction of Urban Inequality." Under review at *Urban Studies*.
- 2018 Boeing, G. "The Effects of Inequality, Density, and Heterogeneous Residential Preferences on Urban Displacement and Metropolitan Structure: An Agent-Based Model." Under review at *Urban Science*.

Peer-Reviewed Book Chapters

- 2018 Boeing, G. "The Morphology and Circuity of Walkable and Drivable Street Networks." Under review, submitted for inclusion in the forthcoming *Mathematics of Urban Morphology*, edited by L. D'Acci. Berlin, Germany: Birkhäuser.
- 2017 Barajas, J. M., G. Boeing, and J. Wartell. "Neighborhood Change, One Pint at a Time: The Impact of Local Characteristics on Craft Breweries." In: *Untapped: Exploring the Cultural Dimensions of Craft Beer* (pp. 155–176), edited by N. G. Chapman, J. S. Lellock, and C. D. Lippard. Morgantown, WV: West Virginia University Press.

Reviews and Other Articles

- 2018 Boeing, G. "Estimating Local Daytime Population Density from Census and Payroll Data." *Regional Studies, Regional Science*, 5 (1), 179–182.
- 2018 Boeing, G. "Automated Street Network Analysis for Urban Planners with OSMnx." *Planning and Technology Today* 117 (Spring), 10–11.
- 2017 Boeing, G. "A Review of the Structure and Dynamics of Cities: Urban Data Analysis and Theoretical Modeling." *Journal of the American Planning Association* 83 (4), 418.
- 2017 Boeing, G. "Understanding Cities through Networks and Flows." *Berkeley Planning Journal* 28 (1), 118–123.

- 2016 Boeing, G. “How Our Neighborhoods Lost Food, and How They Can Get It Back.” *Progressive Planning* 206 (Winter), 35–37.

Proceedings, Reports, and Working Papers

- 2018 Waddell, P., G. Boeing, M. Gardner, and E. Porter. “An Integrated Pipeline Architecture for Modeling Urban Land Use, Travel Demand, and Traffic Assignment.” US Department of Energy SMART Mobility Urban Science Pillar: Coupling Land Use Models and Network Flow Models. Technical report.
- 2018 Boeing, G. “The Relative Circuity of Walkable and Drivable Urban Street Networks.” Transportation Research Board 97th Annual Meeting Compendium. Washington, DC.

Patents

- 2014 Beck, A. E., G. Boeing, and D. Shannon. *Systems and Methods for Analyzing Requirements*. United States patent US8650186B2, European patent EP2413256, Australian patent AU2011204935, Canadian patent CA2747481, Chinese patent CN102346763.

Manuscripts in Preparation and Development

- 2018 Boeing, G. “Topological Inconsistencies in Planar and Nonplanar Graphs of Urban Street Networks.” Target: *Computers, Environment and Urban Systems*.
- 2018 Boeing, G. “Street Networks and Measures for Every US City, County, Urbanized Area, Census Tract, and Zillow Neighborhood.” Target: *Scientific Data*.
- 2018 Boeing, G., J. Wegmann, and J. Jiao. “Regional Rental Housing Information Disparities: Rent Control, Housing Subsidies, and the Craigslist Rental Market.” Target: *Journal of Planning Education and Research*.
- 2018 Boeing, G., R. Goodspeed, and W. Zhang. “The Landscape of Urban Informatics.” Target: *Journal of the American Planning Association*.
- 2018 Boeing, G. “Comparative Visualization of Urban Form and Street Networks: Planning and Communication Tools for Urban Designers.” Target: *Journal of Urban Design*.

INVITED TALKS

- 2018 “The Study of Street Networks in Urban Data Science.” NYU Center for Data Science. New York, New York. Apr 18.
- 2018 “Computational Street Network Analysis in Urban Form Studies.” Columbia University Graduate School of Architecture, Planning, and Preservation. New York, New York. Apr 17.
- 2018 “Scalable Methods for Acquiring, Analyzing, and Visualizing Urban Street Networks.” NYU Center for Urban Science and Progress, Applied Urban Science Group. Brooklyn, New York. Apr 16.
- 2018 “Studying Urban Form and Resilience through Large-Scale Street Network Analysis.” University of California, Santa Barbara, Department of Geography. Santa Barbara, California. Jan 30.

- 2018 “Seeing Cities through New Technologies and Big Data.” University of Oregon, School of Planning, Public Policy, and Management. Eugene, Oregon. Jan 25.
- 2018 “Understanding Urban Form and Circulation through Large-Scale Street Network Analysis.” Dartmouth College, Department of Geography. Hanover, New Hampshire. Jan 15.
- 2017 “Street Network Analyses of Urban Form Resilience and Equity.” University of Chicago, Mansueto Institute for Urban Innovation. Chicago, Illinois. Nov 2.
- 2017 “Measuring Urban Form Sustainability with Topological and Geometric Street Network Analysis.” Stanford University, Sustainable Urban Systems Initiative. Stanford, California. Oct 26.
- 2017 “Graph-Theoretic Representation and Analysis of Urban Street Networks.” Montana State University, Department of Computer Science. Bozeman, Montana. Oct 16.
- 2017 “Urban Street Network Analysis with OSMnx.” Geospatial Innovation Facility, College of Natural Resources, University of California, Berkeley. Berkeley, California. Oct 5.
- 2017 “OpenStreetMap Network Data for Transportation Planning.” Remix Transit Planning. San Francisco, California. Aug 16.
- 2017 “Street Networks: Urban Form and Resilience.” University of Florida, Department of Urban and Regional Planning. Gainesville, Florida. May 8.
- 2017 “Scalable Methods for Acquiring, Analyzing, and Visualizing Urban Street Networks.” The Santa Fe Institute. Santa Fe, New Mexico. Feb 2.
- 2016 “Urban Data Science for Studying Housing Affordability and Urban Form.” NYU Center for Urban Science and Progress. Brooklyn, New York. Dec 14.
- 2016 “New Insights into Rental Housing Markets: Web Scraping and Analyzing Craigslist Rental Listings.” City of Oakland. Oakland, California. May 12.
- 2016 “New Insights into Rental Housing Markets: Web Scraping and Analyzing Craigslist Rental Listings.” City of San Francisco, Citywide Planning Division. San Francisco, California. Apr 19.
- 2016 “Smart Cities, Technology, and Representation: Prospects and Challenges.” Adobe Systems Sustainability Speaker Series. San Jose, California. Jan 28.

CONFERENCE ACTIVITY

Conference Sessions Organized

- 2017 “Emerging Computational Methods in Urban Design.” American Collegiate Schools of Planning Annual Conference (ACSP). Denver, Colorado. Oct 12–15.

Conference Panels

- 2018 “Who Benefits from ‘Smart City’ Technologies? How Can They Be a Piece of the Puzzle Toward Social and Environmental Justice?” Panel member with Lisa Schweitzer, Clint Andrews, Tom Sanchez, and Ceasar McDowell; chaired by Mehdi Heris. American Collegiate Schools of Planning Annual Conference (ACSP). Buffalo, New York. Oct 25–28.

- 2017 “Public Communication Strategies for Planning Academics.” Panel member with Jennifer Dill, Yingling Fan, and Justin Hollander; chaired by Carissa Slotterback. American Collegiate Schools of Planning Annual Conference (ACSP). Denver, Colorado. Oct 12–15.

Conference Presentations

Presenting author *italicized*, if other.

- 2018 Boeing, G. “Sociodemographic Representation of Online Rental Housing Listings: Information Surpluses and Deficits.” American Collegiate Schools of Planning Annual Conference (ACSP). Buffalo, New York. Oct 25–28.
- 2018 *Waddell, P.*, I. Garcia-Dorado, S. Maurer, G. Boeing, M. Gardner, E. Porter, D. Aliaga. “Urban Modeling Without Zones: A Metropolitan Graph-Based Microsimulation of Real Estate Markets and Transportation.” American Collegiate Schools of Planning Annual Conference (ACSP). Buffalo, New York. Oct 25–28.
- 2018 Boeing, G. “Free Data for Free Spaces: Democratizing and Disseminating Spatial Network Data and Models for Better Urban Planning”. Venice Biennale of Architecture. Venice, Italy. Oct 24.
- 2018 Boeing, G. “Street Network Models and Planarity in Urban Form Studies.” SIAM Workshop on Network Science. Portland, Oregon. Jul 12–13.
- 2018 *Waddell, P.*, I. Garcia-Dorado, S. Maurer, G. Boeing, M. Gardner, E. Porter, D. Aliaga. “Architecture for Modular Microsimulation of Real Estate Markets and Transportation.” Symposium on Applied Urban Modelling (AUM). Cambridge, England. Jun 27–29.
- 2017 Boeing, G. “New Methods for Acquiring and Analyzing Worldwide Street Network Data: A Multiscale Analysis of 27,000 Urban Street Networks.” American Collegiate Schools of Planning Annual Conference (ACSP). Denver, Colorado. Oct 12–15.
- 2016 Boeing, G. “Craigslist and U.S. Rental Housing Markets.” American Planning Association Annual Conference (APA). Phoenix, Arizona. Apr 2–5.
- 2016 Boeing, G. “Understanding Informal Rental Housing Markets through Public Data.” Association of American Geographers Annual Meeting (AAG). San Francisco, California. Mar 29–Apr 2.
- 2016 Barajas, J. M., G. Boeing, and *J. Wartell*. “Neighborhood Change, One Pint at a Time: The Impact of Local Characteristics on Craft Breweries.” Urban Affairs Association Annual Conference (UAA). San Diego, California. Mar 16–19.
- 2015 Boeing, G. “Methods for Measuring the Aggregate Complexity Outcomes of Urban Design.” International Conference on Complex Systems. Tempe, Arizona. Sep 28–Oct 2.
- 2015 Boeing, G. “Pedagogy of Urban Informatics.” Environmental Design Circus. Berkeley, California. Mar 6.
- 2014 Boeing, G. and *P. Waddell*. “Web Scraping Urban Data: Lessons from the Lab and the Classroom.” American Collegiate Schools of Planning Annual Conference (ACSP). Philadelphia, Pennsylvania. Oct 30–Nov 2.

- 2014 Boeing, G., D. Church, H. Hubbard, J. Mickens, and L. Rudis. "LEED-ND and Perceptions of Livability." Environmental Design Circus. Berkeley, California. Mar 13.

Conference Discussant

- 2018 Big Ideas session keynote by Marta González. American Collegiate Schools of Planning Annual Conference (ACSP). Buffalo, New York. Oct 25–28.

FELLOWSHIPS, GRANTS, AND AWARDS

- 2017 Doctoral Completion Fellowship, University of California (\$36,655)
2016 Travel Grant, UC Berkeley DCRP (\$500)
2016 Travel Grant, University of California Graduate Division (\$900)
2015 Travel Grant, UC Berkeley DCRP (\$500)
2014 Kaye Bock Award for Best Journal Article (\$250)
2012 Regents' Fellowship, University of California (\$158,025)
2010 Accenture Inventor Innovation Award (\$2,500)

TEACHING EXPERIENCE

Northeastern University

- 2018– Urban Theory and Science (Fall 2018)

University of California, Berkeley

- 2013–16 Urban Informatics and Visualization (co-lead instructor; previously grad student instructor)

Planetizen

- 2017 Python for Planners; Data Analysis and Visualization for Planners; Geospatial Data Analysis; Street Network Analysis

RESEARCH EXPERIENCE

- 2017 Researcher, Turner Center for Housing Innovation. Principal Investigator: Carolina Reid.
2017 Researcher, Center for Community Innovation at the Institute of Urban and Regional Development. Principal Investigator: Karen Chapple.
2013–16 Graduate Student Researcher, UC Berkeley Urban Analytics Lab. Principal Investigator: Paul Waddell.

SERVICE

Reviewer, *Journal of the American Planning Association*
Reviewer, *Environment and Planning B: Urban Analytics and City Science*
Reviewer, *Journal of Transport and Land Use*
Reviewer, *International Journal of Geographical Information Science*
Reviewer, *Urban Design International*
Reviewer, *International Planning Studies*
Reviewer, *International Regional Science Review*
Reviewer, *The European Physical Journal: Data Science*
Reviewer, *ISPRS International Journal of Geoinformation*
Reviewer, *Nonlinear Dynamics*
Ph.D. program faculty representative, UC Berkeley DCRP, 2015–16
Ph.D. program admissions committee, UC Berkeley DCRP, 2015–16
Book review editor, *Berkeley Planning Journal*, 2013–14

PROFESSIONAL AFFILIATIONS

American Planning Association
American Collegiate Schools of Planning
Association of American Geographers
Regional Studies Association
Complex Systems Society
New York Academy of Sciences
Python Software Foundation
Association for Computing Machinery
Project Management Institute

CREDENTIALS

U.S. Department of Defense secret clearance
U.S. Department of Homeland Security public trust
Project Management Professional (PMP)

CONSULTING ENGAGEMENTS

2017– The Public Good Projects

2017– Calthorpe Associates
 2016– UrbanSim Inc.
 2013– Avalon Health Economics
 2013 Raimi & Associates
 2009–13 Accenture

PROFESSIONAL EXPERIENCE

2009–13 Accenture, Consultant/Project Manager. London, England; New York, New York; San Diego, California.
 2007–09 Permission Data, Front-End Systems Product Manager. New York, New York.
 2004–07 Acumen Inc., Web Systems Developer. Mesa, Arizona.

SELECTED RECENT MEDIA COVERAGE

2018 *Fast Company*. “How Crazy Is Your City’s Plan?” Jul 16.
 2018 *The Boston Globe*. “Boston’s Streets Do Go in All Sorts of Directions.” Jul 12.
 2018 *Slate*. “Elegant Graphs Reduce 25 American Cities to Their Design Essence.” Jul 11.
 2018 *Chicago Magazine*. “What Craigslist Can Tell Us About Rents in Chicago.” Jan 24.
 2017 *The San Francisco Chronicle*. “Stunning, Simple Maps Show San Francisco versus Other Global Cities.” Jun 19.
 2017 *The Daily Mail*. “Square Mile Maps Reveal How Different the World’s Cities Really Are.” Jun 9.
 2017 *Forbes*. “Understanding Our Cities, Thanks to Beautiful Maps.” Feb 7.
 2017 *Fast Company*. “Turn Your Local Streets into a Map That Reveals the Character of Your Neighborhood.” Feb 6.
 2017 *Planetizen*. “Comparing a Square Mile of the World’s Famous Cities.” Jan 27.
 2017 *Domus Magazine*. “Do-It-Yourself City Mapping.” Jan 23.
 2017 *NextCity*. “Compare City Grids with This Street Network Tool.” Jan 23.
 2017 *CityLab*. “A Digital Window into Your City’s Urban Form.” Jan 17.
 2017 *Discovery News*. “Compare City Street Grids One Square Mile at a Time.” Jan 9.
 2016 *Builder Magazine*. “The Housing Market According to Craigslist.” Sep 2.
 2016 *The Washington Post*. “What More Than 1 Million Craigslist Rental Listings Tell Us about the Housing Market.” Sep 1.
 2016 *Fast Company*. “11 Million Craigslist Ads Show Which Cities Have the Highest Rents.” Sep 1.
 2016 *CityLab*. “For Quick Housing Data, Hit Craigslist.” Aug 31.
 2016 *Curbed*. “The Typical Craigslist Listing across 58 U.S. Metro Areas.” Aug 29.

- 2016 *NextCity*. “What 11 Million Craigslist Posts Show About Affordable Housing.” Aug 26.
- 2016 *The San Francisco Chronicle*. “The Prices on Craigslist Rental Listings Are Lowest on This Day.” Aug 26.

SKILLS AND METHODS

Statistical and Computational Methods

Multivariate statistics and machine learning, systems analysis, data mining, data wrangling, Python (including numpy, scipy, pandas, matplotlib, statsmodels, networkx, and scikit-learn), R, JavaScript, HTML, web scraping, MySQL, Postgres, and various other databases.

Geospatial Methods

Spatial analysis, network analysis, QGIS, ArcGIS, PostGIS, geopandas, Leaflet, CARTO, agent-based spatial modeling and microsimulation. I created and maintain the popular OSMnx street network analysis package.

International Experience

I have previously worked professionally in the United States, the United Kingdom, Malawi, Mozambique, and Cambodia.

Updated July 2018