GERALD R. FORD SCHOOL OF PUBLIC POLICY
UNIVERSITY OF MICHIGAN

Smart Cities and the Future of Mobility

PUBPOL 750.306

WINTER TERM 2019

Instructor Contact Information
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Course Information
Tuesday & Thursday, 2:30- 3:50PM, Weill Hall Room 1110

Instructor Office Hours
Wednesday 4-5 PM and by appointment

Course Objectives
What are smart cities? What makes them smart? Are they equitable and accessible? The aim of this hands-on applied policy course is to introduce students to smart cities and the rapidly evolving mobility ecosystem. The transportation/mobility system is a major component of a smart city. Hence, this course will focus on the rise of the new mobility ecosystem which includes micro-transit, autonomous vehicles, ride-hailing, bike-sharing, car-sharing, electric scooters, smart parking, etc.

- **The key objective of the course is for students to learn a systems approach to policy analysis and public management of smart cities and emerging mobility technologies.**
- **To achieve this learning objective**
  - **We will revisit the 2016 U.S. DOT Smart Cities Challenge and the applications submitted by the 7 finalists throughout the course.**
  - **Participate in class discussions (10 percent of grade)**
  - **Complete weekly reflections on the readings (60 percent of grade)**
  - **Conduct a group final project memo and presentation (30 percent of grade)**

The course will take a people centered approach to the technology, management and policy analysis for smart cities and the mobility ecosystem. We will take a critical approach that is concerned with ethics, values, human development and equity. The course features guest lectures from experts in smart cities and the new mobility space.

Course Assignments/Due Dates

Assignment	Individual/Team	Assigned	Due Date	% of Final Grade
Weekly Journal reflection on readings/Case-studies	Individual	1 week prior to due date		60
Final Project Report	Team	March 21	April 23	20
Final Presentation			April 23	10
Class participation	Individual			10

Weekly Journal reflection on readings/guest lecture/Case-studies: short 1 page reflection of the readings and application of the reading concepts to 1 of the applications of the Smart Cities Challenge Finalists. Reading questions will be provided.

Final Project: Each student will be assigned to a team of approximately 3. The team will act as a judging panel for the Smart Cities Challenge. The team must select a winner among the 7 finalists applications. The team must submit a memo (5 page max) justifying their selection based on concepts, readings and insights from the guess speakers. The memo must also make recommendations to improve the implementation plan of the winner. The project report will be based on 1) instructor assessment (10%), 2) peer evaluations (5%), and 3) self assessment (5%).

Class participation: Students are expected to be active participants in class discussions, guest lectures and help to foster an inclusive classroom environment.

Materials

- There are no required textbooks for this class.
- (optional) Meadows, D. H. (2008). *Thinking in systems: A primer*. chelsea green publishing. On reserve at the Shapiro Undergraduate library.

FORD SCHOOL OF PUBLIC POLICY INCLUSIVITY STATEMENT

Members of the Ford School community represent a rich variety of backgrounds and perspectives. We are committed to providing an atmosphere for learning that respects diversity. While working together to build this community we ask all members to:

- share their unique experiences, values and beliefs
- be open to the views of others
- honor the uniqueness of their colleagues
- appreciate the opportunity that we have to learn from each other in this community
- value one another's opinions and communicate in a respectful manner
- keep confidential discussions that the community has of a personal (or professional) nature
- use this opportunity together to discuss ways in which we can create an inclusive environment in Ford classes and across the UM community

Accommodations for Students with Disabilities: If you believe you need an accommodation for a disability, please let your instructor know at your earliest convenience. Some aspects of courses may

be modified to facilitate your participation and progress. As soon as you make your instructor aware of your needs, they can work with the Services for Students with Disabilities (SSD) office to help determine appropriate academic accommodations. Any information you provide will be treated as private and confidential.

Student Mental Health and Well-Being Resources: The University of Michigan is committed to advancing the mental health and wellbeing of its students. We acknowledge that a variety of issues, such as strained relationships, increased anxiety, alcohol/drug problems, and depression, directly impacts students' academic performance. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) and/or University Health Service (UHS). For a listing of other mental health resources available on and off campus, visit: http://umich.edu/~mhealth/

Please review additional information and policies regarding academic expectations and resources at the Ford School of Public Policy at this link:

http://fordschool.umich.edu/academics/expectations

Course Schedule

Module 1 Smart Cities: An ecosystems and interaction perspective
Module 2 Mobility: Connecting People

Module 3 Mobility: Technology and Innovation

Module 4 Mobility Public Management: A systems approach

Module 5 Mobility Policy Frameworks

Module 1 Smart Cities: An ecosystem and interaction perspective

Jan 10 Introduction to Smart Cities

Learning Objectives: Overview, history and definition of smart cities
Pre-assignment: None
Required Reading and Activities:

- Mattern, S. (2017). A city is not a computer. *Places Journal*. https://placesjournal.org/article/a-city-is-not-a-computer/#0
- Y COMBINATOR'S PLAN TO BUILD A NEW CITY? NOT ACTUALLY CRAZY, WIRED MAGAZINE, 7/16, HTTPS://WWW.WIRED.COM/2016/07/Y-COMBINATORS-PLAN-BUILD-NEW-CITY-NOT-ACTUALLY-CRAZY/

Optional Reading and Activities:

- The city is not a massive machine, Luis Bettencourt, Livemint, https://www.livemint.com/Politics/k1CagCp3wad3ousVlX3cAP/The-city-is-not-a-massive-machine-says-Luis-Bettencourt.html
- The magic of cities, Knowledge Applied, https://news.uchicago.edu/story/podcast-science-combines-data-reveal-complexity-cities
- The city as a system, https://youtu.be/Y_zgFnytZqI and https://youtu.be/0xyfc6kDof4 and https://www.youtube.com/watch?v=Y_zgFnytZqI
- Mattern, S. (2013). Methodolatry and the Art of Measure. *Places Journal*. https://placesjournal.org/article/methodolatry-and-the-art-of-measure/
- Mattern, S. (2016). Interfacing urban intelligence. *Code and the City*, 49-60. https://placesjournal.org/article/interfacing-urban-intelligence/
- Algorithmic Life, Massimo Mazzotti. LA review of Books, Jan 2017, https://lareviewofbooks.org/article/algorithmic-life/#!
- Foth, M. (Ed.). (2008). *Handbook of research on urban informatics: the practice and promise of the real-time city: the practice and promise of the real-time city*. IGI Global.
- Mumford, L. (1961). *The city in history: Its origins, its transformations, and its prospects* (Vol. 67). Houghton Mifflin Harcourt.

Jan 15 (no class)

Jan 17 Smart Cities: A Critical View

Learning Objectives: Understand and synthesize the Mechanistic and Non-Mechanistic view of Smart Cities.

Pre-assignment: Does the applicant use a Mechanistic and Non-Mechanistic view of smart cities?
Required Reading and Activities:

- Smart City Challenge website, https://www.transportation.gov/smartcity/7-finalists-cities
- A Driving Factor in Moving to Opportunity,http://www.accessmagazine.org/spring-2016/a-driving-factor-in-moving-to-opportunity/

Optional Reading and Activities:

- Evelyn Blumenberg and Gregory Pierce. 2014. "A Driving Factor in Mobility? Transportation's Role in Connecting Subsidized Housing and Employment Outcomes in the Moving to Opportunity (MTO) Program," *Journal of the American Planning Association,* 80(1): 52–66.
- Judith Feins and Mark Shroder. 2005. "Moving to Opportunity: The Demonstration's Design and its Effects on Mobility," *Urban Studies,* 42(8): 1275–1299.

Module 2 Mobility: Connecting People

Jan 22 Economic mobility
Learning Objectives: Overview of the role of transportation in economic mobility
Pre-assignment: How does the applicant connect transportation to economic mobility?
Required Reading and Activities:

- What the Equality of Opportunity Project Actually Says About Commuting, https://usa.streetsblog.org/2016/10/10/what-the-equality-of-opportunity-project-actually-says-about-commuting/
- https://opportunityinsights.org/
- Where Sprawl Makes It Tougher to Rise Up the Social Ranks, https://www.citylab.com/transportation/2016/01/sprawl-social-mobility-ewing-chetty-krugman/431535/
- Stranded by Sprawl, Paul Krugman - NY Times, July 28, 2013 https://www.nytimes.com/2013/07/29/opinion/krugman-stranded-by-sprawl.html?_r=0

Optional Reading and Activities:

- Ewing, R., Hamidi, S., Grace, J. B., & Wei, Y. D. (2016). Does urban sprawl hold down upward mobility?. *Landscape and Urban Planning*, *148*, 80-88.
- Chetty, R., & Hendren, N. (2018). The impacts of neighborhoods on intergenerational mobility I: Childhood exposure effects. *The Quarterly Journal of Economics*, *133*(3), 1107-1162.
- Chetty, R., & Hendren, N. (2018). The impacts of neighborhoods on intergenerational mobility II: County-level estimates. *The Quarterly Journal of Economics*, *133*(3), 1163-1228.

Jan 24 Economic mobility
Learning Objectives: Overview of the role of transportation in economic mobility
Pre-assignment:
Required Reading and Activities:

- Can New Transportation Technologies Improve Equity and Access to Opportunity?, https://www.americanprogress.org/issues/economy/reports/2016/04/27/135425/can-new-transportation-technologies-improve-equity-and-access-to-opportunity/
- Public transportation can be a ride out of poverty, *Rosabeth Moss Kanter, https://www.bostonglobe.com/opinion/2015/05/25/public-transportation-can-ride-out-*

poverty/KtzBMWFo1Xpsqks7NfbYxL/story.html

Optional Reading and Activities:

- Kain, J. F. (1968). Housing segregation, negro employment, and metropolitan decentralization. *The quarterly journal of economics*, *82*(2), 175-197.
- How railroads, highways and other man-made lines racially divide America's cities, https://www.washingtonpost.com/news/wonk/wp/2015/07/16/how-railroads-highways-and-other-man-made-lines-racially-divide-americas-cities/?utm_term=.deaacc99f60e

Jan 29 Accessibility and Equity

Learning Objectives: Introduction to the planning and political economy of transportation justice

Pre-assignment: How does your applicant address equity? Accessibility? Is public transit part of the plan?

Required Reading and Activities:

- The Longest Distance between two points, This American Life, https://www.thisamericanlife.org/629/expect-delays/act-three-0
- https://www.civilrightsteaching.org/desegregation/transportation-protests/
- Why highways have become the center of civil rights protest, https://www.washingtonpost.com/news/wonk/wp/2016/07/13/why-highways-have-become-the-center-of-civil-rights-protest/?utm_term=.e14408be979e

Optional Reading and Activities:

- Title VI is Broken, NextCity, https://nextcity.org/daily/entry/title-vi-is-broken-heres-how-transit-leaders-can-fix-it
- Executive Order 12898, https://www.transportation.gov/sites/dot.gov/files/docs/eo12898.pdf
- Ann Arbor Area Transportation Authority – 2018 Title VI report , http://www.theride.org/Portals/0/Documents/6CustomerService/_AAATA%202018%20Title%20VI%20Program%20Update_optimized.pdf?ver=2018-09-26-125210-907

Jan 31 Accessibility and Equity

Learning Objectives: Introduction to the planning and political economy of transportation justice

Pre-assignment:

Required Reading and Activities:

- Wang, Q., Phillips, N. E., Small, M. L., & Sampson, R. J. (2018). Urban mobility and neighborhood isolation in America's 50 largest cities. *Proceedings of the National Academy of Sciences*, *115*(30), 7735-7740.
- Di Clemente, R., Luengo-Oroz, M., Travizano, M., Xu, S., Vaitla, B., & González, M. C. (2018). Sequences of purchases in credit card data reveal lifestyles in urban populations. *Nature communications*, *9*.

Optional Reading and Activities:

- Gonzalez, M. C., Hidalgo, C. A., & Barabasi, A. L. (2008). Understanding individual human mobility patterns. *nature*, *453*(7196), 779.
- Jiang, S., Ferreira, J., & González, M. C. (2017). Activity-based human mobility patterns inferred from mobile phone data: A case study of Singapore. *IEEE Transactions on Big Data*, *3*(2),
- Schneider, C. M., Belik, V., Couronné, T., Smoreda, Z., & González, M. C. (2013). Unravelling daily human mobility motifs. *Journal of The Royal Society Interface*, *10*(84), 20130246.
- Eagle, N., Pentland, A. S., & Lazer, D. (2009). Inferring friendship network structure by using mobile phone data. *Proceedings of the national academy of sciences*, *106*(36), 15274-15278.
- Lazer, D., Pentland, A. S., Adamic, L., Aral, S., Barabasi, A. L., Brewer, D., ... & Jebara, T. (2009). Life in the network: the coming age of computational social science. *Science (New York, NY)*, *323*(5915), 721.

Feb 5: Mobility: Interaction and Social Isolation

Required Reading and Activities:

- Bliss, Laura. (2017). Older People will need much better transit, City Lab. https://www.citylab.com/transportation/2017/08/older-people-will-need-much-better-transit/535806/

Optional Reading and Activities:

- Big Data and the Well-Being of Women and Girls: Applications on the Social Science Frontier, April 2017, data2x, https://eprints.soton.ac.uk/407908/1/Big_Data_and_the_Well_Being_of_Women_and_Girls.pdf
- Steptoe, A., Shankar, A., Demakakos, P., & Wardle, J. (2013). Social isolation, loneliness, and all-cause mortality in older men and women. *Proceedings of the National Academy of Sciences*, *110*(15), 5797-5801.
- The benefits of Public Transportation: Mobility for the Aging Population, APTA, https://www.apta.com/resources/reportsandpublications/Documents/seniors.pdf

Feb 7: Mobility: Interaction and Social Isolation -> Aging

Required Reading and Activities:

- Shaheen, S., Chan, N., & Rayle, L. (2017). Ridesourcing's impact and role in urban transportation. http://www.accessmagazine.org/spring-2017/ridesourcings-impact-and-role-in-urban-transportation/
- Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States, http://usa.streetsblog.org/wp-content/uploads/sites/5/2017/10/2017_UCD-ITS-RR-17-07.pdf

Optional Reading and Activities:

- Dewey, O. F and L. Rayle. (2016). How Ridesourcing Went from 'Rogue' to Mainstream in San Francisco, Harvard University Graduate School of Design, 41 pages. Available at http://research.gsd.harvard.edu/tut/files/2016/06/San-Francisco-Case-2016.pdf

- Rayle, L., Dai, D., Chan, N., Cervero, R., and Shaheen, S. (2016). Just a Better Taxi? A Survey-Based Comparison of Taxis, Transit, and Ridesourcing Services in San Francisco. *Transport Policy*, Vol. 45, pp. 168-178.

Module 3 Mobility: Technology and Innovation

Feb 12 Shared and On-Demand Mobility
Learning Objectives: Learn the taxonomy of new mobility services
Pre-assignment: Does the applicant connect shared or on-demand mobility to outcomes for people? If so, how? Is it accessible? Is the plan equitable?
Required Reading and Activities:

- The Shared-Use City: Managing the Curb - https://www.itf-oecd.org/sites/default/files/docs/shared-use-city-managing-curb_3.pdf

Feb 14 Shared and On-Demand Mobility –> Speaker: Scoot Mullen, Lime Bikes and Scooters
Learning Objectives:
Pre-assignment:
Required Reading and Activities:

- Pierce, G., & Shoup, D. (2013). Sfpark: Pricing parking by demand. http://www.accessmagazine.org/fall-2013/sfpark-pricing-parking-demand/

Optional Reading and Activities:

- Gregory Pierce and Donald Shoup. 2013. “Getting the Prices Right: An Evaluation of Pricing Parking by Demand,” Journal of the American Planning Association, 79(1): 67–81. San Francisco Municipal Transportation Authority. 2011. SFpark: Putting Theory into Practice.

- Millard-Ball, A., Weinberger, R., & Hampshire, R. (2018). Cruising for Parking: Lessons from San Francisco. In *Parking and the City* (pp. 361-369). Routledge. https://www.accessmagazine.org/fall-2016/cruising-for-parking-lessons-from-san-francisco/

- Gregory Pierce and Donald Shoup. 2013. “Getting the Prices Right: An Evaluation of Pricing Parking by Demand,” Journal of the American Planning Association, 79(1): 67–81. San Francisco Municipal Transportation Authority. 2011. SFpark: Putting Theory into Practice.

Feb 19 Smart Parking
Learning Objectives: Learn about the innovations in the parking industry and how they are related to congestion and pollution reduction.
Pre-assignment: How is the applicant’s proposal connected to parking? What are the implications on congestion and pollution?
Required Reading and Activities:

Feb 21 Smart Parking -> Speaker: Stephanie Nelson, San Francisco Metropolitan Transportation Authority

Required Reading and Activities:

- Blueprint for Autonomous Urbanism, National Association of City Transportation Officials (NAACTO), https://nacto.org/publication/bau/blueprint-for-autonomous-urbanism/

Optional Reading and Activities:

- How San Jose Launched its Autonomous Vision: https://datasmart.ash.harvard.edu/news/article/how-san-jose-launched-its-autonomous-vehicle-vision

Feb 26 Connected and Automated Vehicles

Learning Objectives: Learn the taxonomy connected and automate vehicles. Principles of Autonomous Urbanism
Pre-assignment:
Required Reading and Activities:
Optional Reading and Activities:

Feb 28 Connected and Automated Vehicles -> Speaker: Richard Ezekiel, Union of Concerned Scientists

Learning Objectives:
Pre-assignment: What is the relationship between public transit and autonomous urbanism? How's does the applicant address equity to autonomous vehicles??
Required Reading and Activities:

- Case: Collaboration Drives Mobility - https://datasmart.ash.harvard.edu/news/article/collaboration-drives-mobility-innovation-louisville

Optional Reading and Activities:

Mar 5 - Mar 7: Spring Break

Module 4 Public Management: An ecosystems approach

Mar 12 Managing Mobility Innovations
Learning Objectives: The need for collaboration between varied stakeholders to manage innovation.
Pre-assignment: Does the applicant have a plan and the capacity to management to various pieces of the proposed innovations?
Required Reading and Activities:

- Institutionalizing Analytic Excellence - https://datasmart.ash.harvard.edu/news/article/institutionalizing-analytic-excellence

- Analytics in City Government –https://datasmart.ash.harvard.edu/news/article/analytics-city-government

Optional Reading and Activities:

Mar 14 Building Capacity
Learning Objectives: A survey of programs and strategies around the country to build capacity and expertise in mobility.
Pre-assignment:
Required Reading and Activities:

- Visnjic, I., Neely, A., Cennamo, C., & Visnjic, N. (2016). Governing the city: Unleashing value from the business ecosystem. *California Management Review*, *59*(1), 109-140.

Optional Reading and Activities:

- Meijer, A., & Bolívar, M. P. R. (2016). Governing the smart city: a review of the literature on smart urban governance. *International Review of Administrative Sciences*, *82*(2), 392-408.

Mar 19 Ecosystem Management -> Speaker: Rik Williams, Policy and Economics, Uber

Learning Objectives:
Pre-assignment: Map the stakeholder ecosystem of the applicant's proposal. Apply the platform approach described in "Governing in the City" to taxi's and ride-hailing.
Required Reading and Activities:

- (HBS Case) Uber and the Taxi Industry

Optional Reading and Activities:

- Cannon, S., & Summers, L. H. (2014). How Uber and the sharing economy can win over regulators. *Harvard business review*, *13*(10), 24-28.

Mar 21 Ecosystem Management -> Speaker: Matthew Daus, Former Taxi cab commissioner, NYC
Learning Objectives:
Pre-assignment:
Required Reading and Activities:

- Subways, Strikes, and Slowdowns, http://www.accessmagazine.org/spring-2017/subways-strikes-and-slowdowns/

Optional Reading and Activities:

- Subways, Strikes, and Slowdowns: The Impacts of Public Transit on Traffic Congestion," American Economic Review (2014)104: 2763-2796.
- Campbell, K. B., & Brakewood, C. (2017). Sharing riders: How bikesharing impacts bus ridership in New York City. *Transportation Research Part A: Policy and Practice*, *100*, 264-282.

Mar 26 Ecosystem Management -> Speaker: Jon Coleman, City Solutions, Ford Motor Company

Mar 28 Multi-modal Integration
Learning Objectives:
Pre-assignment: What is the applicant's multi-modal integration plan?
Required Reading and Activities:

- How cities are integrating rideshare and public transportation: https://datasmart.ash.harvard.edu/news/article/how-cities-are-integrating-rideshare-and-public-transportation-978

Optional Reading and Activities:
- Public Transit and Bike Sharing, TCRP SB-27, http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4217

Apr 2 Multi-modal Integration
Learning Objectives: Integrating traditional and emerging mobility modes. What does the evidence say?
Pre-assignment:
Required Reading and Activities:

- David Zipper, Private Mobility Services Need To Share Their Data. Here's How https://www.citylab.com/transportation/2017/07/private-mobility-services-need-to-share-their-data-heres-how/532482/

Optional Reading and Activities:
- Streamlining the London Tube with Data - https://datasmart.ash.harvard.edu/news/article/oyster-cards-clarify-tube-congestion-202
- San Jose improves Traffic Safety - https://datasmart.ash.harvard.edu/news/article/san-jose-tackles-traffic-with-data-802
- Data Supply Chains https://youtu.be/d_cNHntGfg0?list=PLgaCb650Cm5ffP2m2e3bzqXoTSV-hS_w9
- Algorithmic Fairness - https://datasmart.ash.harvard.edu/news/article/algorithmic-fairness-tackling-bias-city-algorithms

Apr 9 Data Management and Transparency -> Speaker: David Zipper, The German Marshall Fund
Learning Objectives:
Pre-assignment:
Required Reading and Activities:

- May, A. D. (2015). Encouraging good practice in the development of Sustainable Urban Mobility Plans. *Case studies on transport policy*, *3*(1), 3-11.
- Akyelken, N., Banister, D., & Givoni, M. (2018). The sustainability of shared mobility in London: The dilemma for governance. *Sustainability*, *10*(2), 420.

Optional Reading and Activities:

Module 5 Mobility Policy Frameworks

Apr 11 European Union – Sustainable Urban Mobility Plans
Learning Objectives: UN Sustainable Development goals and Transportation
Pre-assignment:
Required Reading and Activities:

- *Preparing for the Future of Transportation: Automated Vehicles 3.0*, https://www.transportation.gov/av/3/preparing-future-transportation-automated-vehicles-3

Optional Reading and Activities:

Apr 16. U.S. Automated Vehicle Policy
Learning Objectives: Introduction to voluntary industry self-regulation regimes.
Pre-assignment:
Required Reading and Activities:
Optional Reading and Activities:

Apr 18. State Level Mobility Policy -> John Peracchio, Director of Michigan Council of Future Mobility.
Learning Objectives:
Pre-assignment:
Required Reading and Activities:
Optional Reading and Activities:

Apr 23 Final Project Presentations
Learning Objectives:
Pre-assignment: Written Final project due
Required Reading and Activities:
Optional Reading and Activities:

No Exam