

Introduction to Smart Cities

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Introduction to Smart Cities

PUAD 6600 / ENGR 5218 / URPL 6800

University of Colorado Denver

Fall 2019

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Office Hours: By appointment

Class Dates: August 19 - December 9, 2019

Class Format:

Online: <https://ucdenver.instructure.com>

Classroom: Mondays (in person as noted below) 6:30-9:15 PM, North Building 1405

COURSE DESCRIPTION

A smart city is the introduction at-scale of connectivity and technological innovation that can address everything from infrastructure management and efficiency to service delivery and our overall empowerment as urban citizens. A true smart city is defined by good governance; the seamless integration of analog and digital technologies; balanced and equitable outcomes for all members of the community; and a fundamental rethinking of how to create the city of the future. Cities have a challenge, however: they are built and maintained for decades while technology is changing daily. How will policies adapt to these new technologies and address concerns about privacy, security, and equity? How do policy makers and the private sector work together to define a shared vision and work together to meet these desired outcomes when the tools and model are evolving faster than government? What does it mean for government to become a platform for innovation when its reputation is anything but innovative?

This course will explore some of the most change-making technological innovations in the 21st century and their impact on public policy in cities through a survey of best practices, model policies, and lessons learned from cities across the United States and globe.

This class is a hybrid format, which means that the work will be done in a combination of online and face-to-face formats. Days we will meet in person and weeks we will collaborate online are noted in the calendar below. The online portion is conducted via the electronic course site, Canvas.

COURSE OBJECTIVES

The primary objective of this class is for students to develop a framework for considering the role of technology and innovation in urban development and governance. Specifically, students will:

1. Define basic concepts of smart cities, IoT (Internet of Things), and other technological innovations.
2. Understand how public policy has responded to technological change and identify best practices.
3. Identify case studies that illustrate how technology and cities can work together for more sustainable, equitable and resilient development and growth.

COURSE REQUIREMENTS AND PREREQUISITES

There are no prerequisites for this class, though students must have reliable access to their university email account and to Canvas, to and from which files can be transmitted and online portions of the class can be conducted. Course information will be communicated via Canvas exclusively. To access, click on www.cudenver.edu, then CUOnline (or go directly to www.cuonline.edu (<http://www.cuonline.edu>)). Once you login to Canvas using your UCD credentials, click on PUAD 6600 Section H01 Fall 2019.

COURSE MATERIALS

All required readings/viewings are online, listed below, and will be provided on Canvas. Additional and/or supplemental reading/viewing will likely be added as the course progresses. It is your responsibility to check Canvas multiple times per week. There are no hard copy texts required.

GENERAL ENGAGEMENT IN CLASS COMMUNITY

Participation is expected and evaluated by the following criteria:

- *Contributions*: frequent and consistent; high-quality ideas; succinct, cogent examples and arguments; integrate course readings and personal experiences.
- *Listening*: process and reflect on comments of students and instructor.
- *Integrity*: respectful; inclusive; welcoming; sincere commitment to learning.

ASSIGNMENTS AND EVALUATION

In addition to being prepared for class discussions by completing the reading/watching assignments in advance of each session, there are four primary assignments for this class:

Presentation: There will be one “pecha kucha” style presentation on a specific technology and we explore its impact through a short case study. More details on the presentation style format can be found here: <http://www.pechakucha.org/faq>.

Paper: An approximately 7-page paper on a specific policy recommendation for the City and County of Denver around a transformational technology of your choice. (Other municipalities can certainly be considered. Please contact me to discuss.)

Design Project: There will be a design project which we will workshop in class, the final presentation of which will occur after time spent working on it individually or in groups.

Final Paper: The final, longer paper will conclude the assignments for this course. Topics to be discussed.

Course Grading:

Class Participation: 20%

Short Presentation: 10%

Short Paper: 20%

Design Project: 25%

Final Paper: 25%

COURSE FORMAT

Class periods will be divided into reading discussions, in-class assignments, student-led presentations, site visits, and workshops. As the course develops, I may find it necessary to adjust or revise the material. I will inform you of changes as the semester proceeds.

CLASS SCHEDULE

| Date | Topics | Notes |
|-------------------------------------|--|--|
| Week 1 August 19 | A History of Urban Futures and the "Smart" City | |
| Week 2 August 26 - ONLINE | Civic + Community + Crowdsourced Engagement | Short presentation topics selected. |
| <i>Sept. 2 - NO CLASS</i> | | |
| Week 3 Sept 9 | Big Data, Open Data, and the Perils of "Democracy by Spreadsheet" | Presentations delivered in-class. |
| Week 4 Sept 16 - ONLINE | Instrumented Infrastructure + The Internet of Things | Short paper topics selected. |
| Week 5 Sept 23 | FIELD TRIP: The Networks of Denver | Wear walking shoes and bring an umbrella if needed. We will meet at 1250 14th Street (CU CityCenter). |
| Week 6 Sept 30 - ONLINE | The Rise of Urban Science, Simulation, and Gaming | |
| Week 7 Oct 7 | Design Project Workshop | Short papers due. |
| Week 8 Oct 14 - ONLINE | Governance, Equity, and Privacy in the Digital Age | |
| Week 9 Oct 21 | Autonomous, Connected, Electric, and Micro Mobility | |
| Week 10 Oct 28 - ONLINE | The Economics of the Smart City: Civic Tech, Innovation Districts, and Public-Private Partnerships | |
| Week 11 Nov 4 | Energy, Sustainability, and Resiliency | |
| Week 12 Nov 11 - ONLINE | Public Health and Safety in a Hyper-Connected World | |
| Week 13 | Design Project Presentations | |

Nov 18

Nov 25 - NO CLASS

Week 14 A (Non-Exhaustive) Overview of The Ways Smart Cities Fail

Dec 2 - ONLINE

Week 15 Technology, Design, and Policy Trajectories **Final Papers Due**

Dec 9

CLASS READINGS

Week 1: A History of Urban Futures and the “Smart” City

- [The City Is Not a Computer](https://placesjournal.org/article/a-city-is-not-a-computer/) [\(https://placesjournal.org/article/a-city-is-not-a-computer/\)](https://placesjournal.org/article/a-city-is-not-a-computer/), Shannon Mattern
- [An Idiot’s Guide to futuristic smart cities under development](https://www.curbed.com/2017/11/17/16670378/smart-city-sidewalk-labs-bill-gates-elon-musk/) [\(https://www.curbed.com/2017/11/17/16670378/smart-city-sidewalk-labs-bill-gates-elon-musk/\)](https://www.curbed.com/2017/11/17/16670378/smart-city-sidewalk-labs-bill-gates-elon-musk/), Patrick Sisson
- [\(https://monum.github.io/playbook/\)](https://monum.github.io/playbook/) [Boston Smart City Playbook](https://monum.github.io/playbook/) [\(https://monum.github.io/playbook/\)](https://monum.github.io/playbook/), *City of Boston*
- [City of Chicago Technology Plan](https://techplan.cityofchicago.org/) [\(https://techplan.cityofchicago.org/\)](https://techplan.cityofchicago.org/), *City of Chicago*
- [\(https://techplan.cityofchicago.org/\)](https://techplan.cityofchicago.org/) [Barcelona: The most wired city in the world](http://fortune.com/2015/07/29/barcelona-wired-city/) [\(http://fortune.com/2015/07/29/barcelona-wired-city/\)](http://fortune.com/2015/07/29/barcelona-wired-city/), Vivienne Walt
- [Hudson Yards Is Manhattan’s Biggest, Newest, Slickest Gated Community. Is This the Neighborhood New York Deserves?](https://www.nytimes.com/interactive/2019/03/14/arts/design/hudson-yards-nyc.html) [\(https://www.nytimes.com/interactive/2019/03/14/arts/design/hudson-yards-nyc.html\)](https://www.nytimes.com/interactive/2019/03/14/arts/design/hudson-yards-nyc.html), Michael Kimmelman
- [\(http://fortune.com/2015/07/29/barcelona-wired-city/\)](http://fortune.com/2015/07/29/barcelona-wired-city/) [Stop Saying ‘Smart Cities’](https://www.theatlantic.com/technology/archive/2018/02/stupid-cities/553052/) [\(https://www.theatlantic.com/technology/archive/2018/02/stupid-cities/553052/\)](https://www.theatlantic.com/technology/archive/2018/02/stupid-cities/553052/), Bruce Sterling
- [I’m an Engineer, and I’m Not Buying Into ‘Smart’ Cities](https://www.nytimes.com/2019/07/16/opinion/smart-cities.html) [\(https://www.nytimes.com/2019/07/16/opinion/smart-cities.html\)](https://www.nytimes.com/2019/07/16/opinion/smart-cities.html), Shoshanna Saxe
- OPTIONAL: [Code and Clay, Data and Dirt: Five Thousand Years of Urban Media](https://www.amazon.com/Code-Clay-Data-Dirt-Thousand/dp/1517902444/ref=sr_1_1?s=books&ie=UTF8&qid=1536458114&sr=1-1&keywords=code+and+clay) [\(https://www.amazon.com/Code-Clay-Data-Dirt-Thousand/dp/1517902444/ref=sr_1_1?s=books&ie=UTF8&qid=1536458114&sr=1-1&keywords=code+and+clay\)](https://www.amazon.com/Code-Clay-Data-Dirt-Thousand/dp/1517902444/ref=sr_1_1?s=books&ie=UTF8&qid=1536458114&sr=1-1&keywords=code+and+clay), Shannon Mattern
- OPTIONAL: [Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia](https://www.amazon.com/Smart-Cities-Civic-Hackers-Utopia/dp/0393349780/ref=sr_1_1?ie=UTF8&qid=1536444380&sr=8-1&keywords=smart+cities+townsend) [\(https://www.amazon.com/Smart-Cities-Civic-Hackers-Utopia/dp/0393349780/ref=sr_1_1?ie=UTF8&qid=1536444380&sr=8-1&keywords=smart+cities+townsend\)](https://www.amazon.com/Smart-Cities-Civic-Hackers-Utopia/dp/0393349780/ref=sr_1_1?ie=UTF8&qid=1536444380&sr=8-1&keywords=smart+cities+townsend), Anthony Townsend

Week 2: Civic + Community + Crowdsourced Engagement

- [A definition for civic innovation](http://gov20.govfresh.com/defining-civic-innovation-definition-open-government/) [\(http://gov20.govfresh.com/defining-civic-innovation-definition-open-government/\)](http://gov20.govfresh.com/defining-civic-innovation-definition-open-government/), Alex Howard
- [On the smart city; Or, a ‘manifesto’ for smart citizens instead](https://medium.com/butwhatwasthequestion/on-the-smart-city-or-a-manifesto-for-smart-citizens-instead-7e0c6425f909) [\(https://medium.com/butwhatwasthequestion/on-the-smart-city-or-a-manifesto-for-smart-citizens-instead-7e0c6425f909\)](https://medium.com/butwhatwasthequestion/on-the-smart-city-or-a-manifesto-for-smart-citizens-instead-7e0c6425f909), Dan Hill
- [There’s an App for That: “Civic hacking” and the transformation of local government](https://www.politico.com/magazine/story/2014/06/boston-theres-an-app-for-that-107661) [\(https://www.politico.com/magazine/story/2014/06/boston-theres-an-app-for-that-107661\)](https://www.politico.com/magazine/story/2014/06/boston-theres-an-app-for-that-107661), Ben Schreckinger
- [The Emergence of Civic Tech: Investments in a Growing Field](http://www.knightfoundation.org/media/uploads/publication_pdfs/knight-civic-tech.pdf) [\(http://www.knightfoundation.org/media/uploads/publication_pdfs/knight-civic-tech.pdf\)](http://www.knightfoundation.org/media/uploads/publication_pdfs/knight-civic-tech.pdf), *Knight Foundation*
- [How Citizens See It: Kansas City’s Citizen Survey Adds Citizen’s Perceptions to the Equation](http://www.knightfoundation.org/media/uploads/publication_pdfs/knight-civic-tech.pdf) [\(http://datasmart.ash.harvard.edu/news/article/how-citizens-see-it-677\)](http://datasmart.ash.harvard.edu/news/article/how-citizens-see-it-677), Laura Adler
- [How Geocities Suburbanized the Internet](https://www.citylab.com/life/2019/01/geocities-archive-netscape-browser-first-web-suburbs-aol/580285/) [\(https://www.citylab.com/life/2019/01/geocities-archive-netscape-browser-first-web-suburbs-aol/580285/\)](https://www.citylab.com/life/2019/01/geocities-archive-netscape-browser-first-web-suburbs-aol/580285/), Tanner Howard
- [What Determines Your Social Network? In New York, Your Subway Line](https://slate.com/business/2019/07/facebook-subway-social-network-trains-new-york.html) [\(https://slate.com/business/2019/07/facebook-subway-social-network-trains-new-york.html\)](https://slate.com/business/2019/07/facebook-subway-social-network-trains-new-york.html), Henry Grabar
- [We Live In The Safest Big City, But Citizen Is Scaring The Hell Out Of People](https://www.buzzfeednews.com/article/justinbrannan/nyc-brooklyn-safe-citizen-app-freakout) [\(https://www.buzzfeednews.com/article/justinbrannan/nyc-brooklyn-safe-citizen-app-freakout\)](https://www.buzzfeednews.com/article/justinbrannan/nyc-brooklyn-safe-citizen-app-freakout), Justin Brannan
- OPTIONAL: [The Responsive City: Engaging Communities Through Data-Smart Governance](https://www.amazon.com/Responsive-City-Communities-Data-Smart-Governance/dp/1118910907/ref=sr_1_1?s=books&ie=UTF8&qid=1536444652&sr=1-1&keywords=The+Responsive+City%3A+Engaging+Communities+Through+Data+Smart+Governance) [\(https://www.amazon.com/Responsive-City-Communities-Data-Smart-Governance/dp/1118910907/ref=sr_1_1?s=books&ie=UTF8&qid=1536444652&sr=1-1&keywords=The+Responsive+City%3A+Engaging+Communities+Through+Data+Smart+Governance\)](https://www.amazon.com/Responsive-City-Communities-Data-Smart-Governance/dp/1118910907/ref=sr_1_1?s=books&ie=UTF8&qid=1536444652&sr=1-1&keywords=The+Responsive+City%3A+Engaging+Communities+Through+Data+Smart+Governance), Stephen Goldsmith and Susan Crawford

Week 3: Big Data, Open Data, and the Perils of “Democracy by Spreadsheet”

- [A Contract for Public Good: Urban Data in the Digital Age](https://newcities.org/perspective-a-contract-for-public-good-urban-data-in-the-digital-age/) [\(https://newcities.org/perspective-a-contract-for-public-good-urban-data-in-the-digital-age/\)](https://newcities.org/perspective-a-contract-for-public-good-urban-data-in-the-digital-age/), Ashley Hand
- [Big Data, Big Questions: Who Owns Our Data in Smart Cities?](https://www.metropolismag.com/cities/big-data-big-questions-data-smart-cities/) [\(https://www.metropolismag.com/cities/big-data-big-questions-data-smart-cities/\)](https://www.metropolismag.com/cities/big-data-big-questions-data-smart-cities/), Alex Marshall

- <https://www.metropolismag.com/cities/big-data-big-questions-data-smart-cities/> **Big Data and Urban Informatics: Innovations and Challenges to Urban Planning and Knowledge Discovery** <https://urbanbigdata.uic.edu/files/2015/11/Background.pdf>), Thakuria, P., N. Tilahun and M. Zellner
- **Mission Control: A History of the Urban Dashboard** <https://placesjournal.org/article/mission-control-a-history-of-the-urban-dashboard/>), Shannon Mattern
- **Los Angeles' mobility data specification unlocks potential for data management** <https://www.smartcitiesdive.com/news/los-angeles-mobility-data-specification-dockless-rideshare/546692/>), Katie Pyzyk
- **Is urban theory changing big data?** <https://medium.com/global-infrastructures/is-urban-theory-changing-big-data-dc2120e5e263>), Alan Wiig

Week 4: Instrumented Infrastructure + The Internet of Things

- **The Urban Internet of Things** <https://datasmart.ash.harvard.edu/news/article/the-urban-internet-of-things-727>), Laura Adler
- **The Battle for the Infrastructure of Everyday Life** <https://medium.com/butwhatwasthequestion/the-battle-for-the-infrastructure-of-everyday-life-6c9b0572e57f>), Dan Hill
- **The Street as Platform 2050** <https://medium.com/butwhatwasthequestion/the-street-as-platform-2050-98bbb81016f4>), Dan Hill
- <https://medium.com/butwhatwasthequestion/the-street-as-platform-2050-98bbb81016f4> **Instrumental City: The View from Hudson Yards** <https://placesjournal.org/article/instrumental-city-new-york-hudson-yards/>), Shannon Mattern
- <https://placesjournal.org/article/instrumental-city-new-york-hudson-yards/> **Hello Lamp Post and the idea of playful cities** <https://www.theguardian.com/technology/gamesblog/2013/jun/27/hello-lamp-post-playful-cities>), Keith Stuart
- **Chicago's new smart sensor network is a game changer for city data** <https://www.curbed.com/2016/9/7/12840398/chicago-smart-city-urban-planning-array-of-things>), Patrick Sisson
- **Unseen Sensors** <https://designmind.frogdesign.com/2014/05/unseen-sensors-constantly-sensing-rarely-seen/>), Mayo Nissen
- **Colorful Language: Decoding Utility Markings Spray-Painted on City Streets** <https://99percentinvisible.org/article/colorful-language-decoding-utility-markings-spray-painted-on-city-streets/>), Kurt Kohlstedt
- **The Race to Code the Curb** <https://www.citylab.com/transportation/2019/04/smart-cities-maps-curb-data-coord-sidewalk-tech-street-design/586177/>), Laura Bliss
- OPTIONAL: **Networks of New York** <https://www.amazon.com/Networks-New-York-Illustrated-Infrastructure/dp/1612195423>), Ingrid Burrington

Week 6: The Rise of Urban Science, Simulation, and Gaming

- **Life in the City Is Essentially One Giant Math Problem** <https://www.smithsonianmag.com/innovation/life-in-the-city-is-essentially-one-giant-math-problem-37759041/>), Jerry Adler
- **Going Critical** <https://meltingasphalt.com/interactive/going-critical/>), Kevin Simler
- **When civic tech and urban science collide** <https://civichall.org/civicist/when-civic-tech-and-urban-science-collide/>), Anthony Townsend
- **The Age of the Smart City**, Michael Batty [PDF]
- **Cities of Data** <http://www.citiesofdata.org/>) (explore as your interest dictates)
- **Modeling Boston**, Carlos Cerezo Davila, Cristoph Reinhart, Jamie Bemis [PDF]
- **Introduction to Urban Simulation**, Paul Waddell [PDF]
- **From video game to day job: How 'SimCity' inspired a generation of city planners** <https://www.latimes.com/business/technology/la-fi-tn-simcity-inspired-urban-planners-20190305-story.html>), Jessica Roy
- **Capture All: SimCity, Gamespace, and Play** <http://averyreview.com/issues/6/capture-all-i-simcity-i-gamespace-and-play>), McKenzie Wark
- **urban screens: the schematic city in gaming and architectural representation** <http://www.3ammagazine.com/3am/urban-screens/>), Greg J. Smith
- **What I Learned Playing SimCity** <http://cityobservatory.org/what-i-learned-playing-simcity/>), Daniel Hertz

Week 8: Governance, Equity, and Privacy in the Digital Age

- **Customer-Driven Government** <http://datasmart.ash.harvard.edu/news/article/customer-driven-government-721>), Jane Wiseman
- **Our data is valuable. Here's how we can take that value back** <https://www.theguardian.com/commentisfree/2018/apr/05/data-valuable-citizens-silicon-valley-barcelona>), Francesca Bria
- **Smart cities and the plight of cultural authenticity** <http://globalurbanist.com/2015/03/24/smart-cities-cultural-authenticity>), Kris Hartley
- **Twelve Days in Xinjiang: How China's Surveillance State Overwhelms Daily Life** <https://www.wsj.com/articles/twelve-days-in-xinjiang-how-chinas-surveillance-state-overwhelms-daily-life-1513700355>), Josh Chin and Clément Bûrge
- **Smart Cities - The Cyber Security and Privacy Implications of Ubiquitous Urban Computing** <http://cyberlaw.stanford.edu/blog/2016/02/smart-cities-%E2%80%93-cyber-security-and-privacy-implications-ubiquitous-urban-computing>), Brian Nussbaum
- **Protecting Big Data: Seattle's digital privacy initiative on track with new data safeguards** <https://datasmart.ash.harvard.edu/news/article/protecting-big-data-742>), Stephen Goldsmith
- **Could Denver become the first city in the country to be designed for women?** <https://www.5280.com/2019/02/its-a-mans-world-but-it-doesnt-have-to-be/>), Daliah Singer

Week 9: Autonomous, Connected, Electric and Micro Mobility

- [Blueprint for Autonomous Urbanism](https://nacto.org/publication/bau/blueprint-for-autonomous-urbanism/) [\(https://nacto.org/publication/bau/blueprint-for-autonomous-urbanism/\)](https://nacto.org/publication/bau/blueprint-for-autonomous-urbanism/), National Association of City Transportation Officials
- [Re-Programming Mobility: The Digital Transformation of Transportation in the United States](https://www.bitsandatoms.net/wp-content/uploads/2019/01/re-programming-mobility-scenario-report.pdf) [_ \(https://www.bitsandatoms.net/wp-content/uploads/2019/01/re-programming-mobility-scenario-report.pdf\)](https://www.bitsandatoms.net/wp-content/uploads/2019/01/re-programming-mobility-scenario-report.pdf), Anthony Townsend
- [General Motors CEO: We call for federal electric and zero-emission vehicle policies](https://www.usatoday.com/story/opinion/2018/10/26/general-motors-zero-emission-vehicle-electric-cars-mary-barra-ceo-column/1760801002/) [_ \(https://www.usatoday.com/story/opinion/2018/10/26/general-motors-zero-emission-vehicle-electric-cars-mary-barra-ceo-column/1760801002/\)](https://www.usatoday.com/story/opinion/2018/10/26/general-motors-zero-emission-vehicle-electric-cars-mary-barra-ceo-column/1760801002/), Mary Barra
- [Electric Utilities Plot Bullish Course for EV Charging Infrastructure](http://www.govtech.com/Electric-Utilities-Plot-Bullish-Course-for-EV-Charging-Infrastructure.html) [_ \(http://www.govtech.com/Electric-Utilities-Plot-Bullish-Course-for-EV-Charging-Infrastructure.html\)](http://www.govtech.com/Electric-Utilities-Plot-Bullish-Course-for-EV-Charging-Infrastructure.html), Skip Descant
- [Automated Vehicles Can't Save Cities](https://www.nytimes.com/interactive/2018/02/27/opinion/automated-vehicles-cant-save-cities.html) [_ \(https://www.nytimes.com/interactive/2018/02/27/opinion/automated-vehicles-cant-save-cities.html\)](https://www.nytimes.com/interactive/2018/02/27/opinion/automated-vehicles-cant-save-cities.html), Allison Arieff
- [Toyota's Vision of Autonomous Cars Is Not Exactly Driverless](https://www.bloomberg.com/news/features/2018-09-19/toyota-s-vision-of-autonomous-cars-is-not-exactly-driverless) [_ \(https://www.bloomberg.com/news/features/2018-09-19/toyota-s-vision-of-autonomous-cars-is-not-exactly-driverless\)](https://www.bloomberg.com/news/features/2018-09-19/toyota-s-vision-of-autonomous-cars-is-not-exactly-driverless), John Lippert, Bryan Gruley, Kae Inoue, and Gabrielle Coppola
- [What if Uber kills off public transport rather than cars?](https://www.theguardian.com/sustainable-business/2017/jan/13/uber-lyft-cars-public-transport-cities-commuting) [_ \(https://www.theguardian.com/sustainable-business/2017/jan/13/uber-lyft-cars-public-transport-cities-commuting\)](https://www.theguardian.com/sustainable-business/2017/jan/13/uber-lyft-cars-public-transport-cities-commuting), Greg Lindsay
- [Wielding Rocks and Knives, Arizonans Attack Self-Driving Cars](https://www.nytimes.com/2018/12/31/us/waymo-self-driving-cars-arizona-attacks.html) [_ \(https://www.nytimes.com/2018/12/31/us/waymo-self-driving-cars-arizona-attacks.html\)](https://www.nytimes.com/2018/12/31/us/waymo-self-driving-cars-arizona-attacks.html), Simon Romero
- [A Study on Driverless-Car Ethics Offers a Troubling Look Into Our Values](https://www.newyorker.com/science/elements/a-study-on-driverless-car-ethics-offers-a-troubling-look-into-our-values) [_ \(https://www.newyorker.com/science/elements/a-study-on-driverless-car-ethics-offers-a-troubling-look-into-our-values\)](https://www.newyorker.com/science/elements/a-study-on-driverless-car-ethics-offers-a-troubling-look-into-our-values), Caroline Lester
- [Denver Plows Ahead with Connected Vehicle Tech Deployments](https://www.govtech.com/products/Denver-Plows-Ahead-with-Connected-Vehicle-Tech-Deployments.html) [_ \(https://www.govtech.com/products/Denver-Plows-Ahead-with-Connected-Vehicle-Tech-Deployments.html\)](https://www.govtech.com/products/Denver-Plows-Ahead-with-Connected-Vehicle-Tech-Deployments.html), Skip Descant
- [Don't ban scooters. Redesign streets.](https://www.curbed.com/word-on-the-street/2018/7/13/17246060/scooters-uber-lyft-bird-lime-streets) [_ \(https://www.curbed.com/word-on-the-street/2018/7/13/17246060/scooters-uber-lyft-bird-lime-streets\)](https://www.curbed.com/word-on-the-street/2018/7/13/17246060/scooters-uber-lyft-bird-lime-streets), Alissa Walker
- [Between Cars And Micromobility Lies 'Minimobility' - A Self-Driving Transportation Revolution](https://www.forbes.com/sites/bradtempleton/2019/08/12/between-cars-and-micromobility-lies-minimobility-a-self-driving-transportation-revolution/#5b350ae43bba) [_ \(https://www.forbes.com/sites/bradtempleton/2019/08/12/between-cars-and-micromobility-lies-minimobility-a-self-driving-transportation-revolution/#5b350ae43bba\)](https://www.forbes.com/sites/bradtempleton/2019/08/12/between-cars-and-micromobility-lies-minimobility-a-self-driving-transportation-revolution/#5b350ae43bba), Brad Templeton

Week 10: The Economics of the Smart City: Civic Tech, Innovation Districts, and Public-Private Partnerships

- [Parks Get Help Navigating Public-Private Partnerships](https://nextcity.org/daily/entry/parks-public-private-partnerships) [_ \(https://nextcity.org/daily/entry/parks-public-private-partnerships\)](https://nextcity.org/daily/entry/parks-public-private-partnerships), Jen Kinney
- [_ \(https://nextcity.org/daily/entry/parks-public-private-partnerships\) You're living in a lab: Microsoft, Accenture, Siemens, UI Labs tinker with a new 'city that works' here](http://www.chicagobusiness.com/article/20150321/ISSUE01/150329963/youre-living-in-a-lab-microsoft-accenture-siemens-ui-labs-tinker) [_ \(http://www.chicagobusiness.com/article/20150321/ISSUE01/150329963/youre-living-in-a-lab-microsoft-accenture-siemens-ui-labs-tinker\)](http://www.chicagobusiness.com/article/20150321/ISSUE01/150329963/youre-living-in-a-lab-microsoft-accenture-siemens-ui-labs-tinker), John Pletz
- [Sidewalk Labs, a Start-Up Created by Google, Has Bold Aims to Improve City Living](https://www.nytimes.com/2015/06/11/technology/sidewalk-labs-a-start-up-created-by-google-has-bold-aims-to-improve-city-living.html) [_ \(https://www.nytimes.com/2015/06/11/technology/sidewalk-labs-a-start-up-created-by-google-has-bold-aims-to-improve-city-living.html\)](https://www.nytimes.com/2015/06/11/technology/sidewalk-labs-a-start-up-created-by-google-has-bold-aims-to-improve-city-living.html), Steve Lohr
- [Does Elon Musk Understand Urban Geometry?](http://humantransit.org/2016/07/elon-musk-doesnt-understand-geometry.html) [_ \(http://humantransit.org/2016/07/elon-musk-doesnt-understand-geometry.html\)](http://humantransit.org/2016/07/elon-musk-doesnt-understand-geometry.html), Jarrett Walker
- [Why the "wrong side of the tracks" is usually the east side of cities](https://www.ted.com/talks/stephen_deberry_why_the_wrong_side_of_the_tracks_is_usually_the_east_side_of_cities#t-38294) [_ \(https://www.ted.com/talks/stephen_deberry_why_the_wrong_side_of_the_tracks_is_usually_the_east_side_of_cities#t-38294\)](https://www.ted.com/talks/stephen_deberry_why_the_wrong_side_of_the_tracks_is_usually_the_east_side_of_cities#t-38294), Stephen DeBerry
- [Our car-free future will be blocked by Comcast tactics](https://medium.com/transit-app/our-car-free-future-will-be-blocked-by-comcast-tactics-926c8ee2ea70) [_ \(https://medium.com/transit-app/our-car-free-future-will-be-blocked-by-comcast-tactics-926c8ee2ea70\)](https://medium.com/transit-app/our-car-free-future-will-be-blocked-by-comcast-tactics-926c8ee2ea70), Transit
- OPTIONAL: [Start-up City](https://www.amazon.com/Start-Up-City-Inspiring-Entrepreneurship-Projects/dp/1610916905/ref=sr_1_1?ie=UTF8&qid=1536458984&sr=1-1&keywords=startup+city) [_ \(https://www.amazon.com/Start-Up-City-Inspiring-Entrepreneurship-Projects/dp/1610916905/ref=sr_1_1?ie=UTF8&qid=1536458984&sr=1-1&keywords=startup+city\)](https://www.amazon.com/Start-Up-City-Inspiring-Entrepreneurship-Projects/dp/1610916905/ref=sr_1_1?ie=UTF8&qid=1536458984&sr=1-1&keywords=startup+city), Gabe Klein

Week 11: Energy, Sustainability, and Resiliency

- [New Data Tool Helps Cities Take Climate Action](https://nextcity.org/daily/entry/white-house-launches-data-tool-climate-resilience) [_ \(https://nextcity.org/daily/entry/white-house-launches-data-tool-climate-resilience\)](https://nextcity.org/daily/entry/white-house-launches-data-tool-climate-resilience), Jen Kinney
- [Development and Implementation of a Parametric Energy Tool for Building Owners](#), Craig Burton and Matthew Shaxted [PDF]
- [Urban Resilience](http://seedmagazine.com/content/article/urban_resilience/) [_ \(http://seedmagazine.com/content/article/urban_resilience/\)](http://seedmagazine.com/content/article/urban_resilience/), Maywa Montenegro
- [Embracing the Autocatalytic City](https://www.citylab.com/equity/2013/03/embracing-autocatalytic-city/4909/) [_ \(https://www.citylab.com/equity/2013/03/embracing-autocatalytic-city/4909/\)](https://www.citylab.com/equity/2013/03/embracing-autocatalytic-city/4909/), Benjamin De La Peña
- [Tesla's City Problem](https://thenearlynow.com/teslas-city-problem-59930eb945ba#xv9hnbfg) [_ \(https://thenearlynow.com/teslas-city-problem-59930eb945ba#xv9hnbfg\)](https://thenearlynow.com/teslas-city-problem-59930eb945ba#xv9hnbfg), Alex Steffen
- [Is 'Climate-Positive Design Possible?](https://www.citylab.com/environment/2018/12/cities-climate-change-positive-design-planning/574513/) [_ \(https://www.citylab.com/environment/2018/12/cities-climate-change-positive-design-planning/574513/\)](https://www.citylab.com/environment/2018/12/cities-climate-change-positive-design-planning/574513/), Liz Enochs

Week 12: Public Health and Safety in a Hyper-Connected World

- [Should a self-driving car kill the baby or the grandma? Depends on where you're from](https://www.technologyreview.com/s/612341/a-global-ethics-study-aims-to-help-ai-solve-the-self-driving-trolley-problem/) [_ \(https://www.technologyreview.com/s/612341/a-global-ethics-study-aims-to-help-ai-solve-the-self-driving-trolley-problem/\)](https://www.technologyreview.com/s/612341/a-global-ethics-study-aims-to-help-ai-solve-the-self-driving-trolley-problem/) by Karen Hao
- [Health Department Use of Social Media to Identify Foodborne Illness](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6332a1.htm) [_ \(http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6332a1.htm\)](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6332a1.htm), Centers for Disease Control and Prevention
- [Smart Cities or Surveillance Cities?](https://www.planning.org/planning/2019/mar/smartcities/) [_ \(https://www.planning.org/planning/2019/mar/smartcities/\)](https://www.planning.org/planning/2019/mar/smartcities/), Brian Barth

- [Looking at buildings can actually give people headaches. Here's why](https://www.cnn.com/style/article/why-looking-at-buildings-can-give-people-headaches/index.html) [.\(https://www.cnn.com/style/article/why-looking-at-buildings-can-give-people-headaches/index.html\)](https://www.cnn.com/style/article/why-looking-at-buildings-can-give-people-headaches/index.html), Arnold Wilkins
- [Ransomware Attacks Are Testing Resolve of Cities Across America](https://www.nytimes.com/2019/08/22/us/ransomware-attacks-hacking.html) [.\(https://www.nytimes.com/2019/08/22/us/ransomware-attacks-hacking.html\)](https://www.nytimes.com/2019/08/22/us/ransomware-attacks-hacking.html), Manny Fernandez
- [Cars that talk to each other are coming soon, and could save thousands of lives](https://www.digitaltrends.com/cars/ford-panasonic-v2x-car-communication/) [.\(https://www.digitaltrends.com/cars/ford-panasonic-v2x-car-communication/\)](https://www.digitaltrends.com/cars/ford-panasonic-v2x-car-communication/), Nick Mokey

Week 14: A (Non-Exhaustive) Overview of The Ways Smart Cities Fail

- [10 Failed Utopian Cities That Influenced the Future](https://io9.gizmodo.com/10-failed-utopian-cities-that-influenced-the-future-1511695279) [.\(https://io9.gizmodo.com/10-failed-utopian-cities-that-influenced-the-future-1511695279\)](https://io9.gizmodo.com/10-failed-utopian-cities-that-influenced-the-future-1511695279), Annalee Newitz and Emily Stamm
- [The Big Hack](http://nymag.com/daily/intelligencer/2016/06/the-hack-that-could-take-down-nyc.html) [.\(http://nymag.com/daily/intelligencer/2016/06/the-hack-that-could-take-down-nyc.html\)](http://nymag.com/daily/intelligencer/2016/06/the-hack-that-could-take-down-nyc.html), Reeves Wiedeman
- [Not-So-Smart Cities](https://www.nytimes.com/2011/09/25/opinion/sunday/not-so-smart-cities.html) [.\(https://www.nytimes.com/2011/09/25/opinion/sunday/not-so-smart-cities.html\)](https://www.nytimes.com/2011/09/25/opinion/sunday/not-so-smart-cities.html), Greg Lindsay
- [My thoughts on the smart city](http://ec.europa.eu/archives/commission_2010-2014/kroes/en/content/my-thoughts-smart-city-rem-koolhaas.html) [.\(http://ec.europa.eu/archives/commission_2010-2014/kroes/en/content/my-thoughts-smart-city-rem-koolhaas.html\)](http://ec.europa.eu/archives/commission_2010-2014/kroes/en/content/my-thoughts-smart-city-rem-koolhaas.html), Rem Koolhaas
- [Illusion of control: Why the world is full of buttons that don't work](https://edition.cnn.com/style/article/placebo-buttons-design/index.html) [.\(https://edition.cnn.com/style/article/placebo-buttons-design/index.html\)](https://edition.cnn.com/style/article/placebo-buttons-design/index.html), Jacopo Prisco

Week 15: Technology, Design, and Policy Trajectories

- [Living, breathing smart communities in Colorado? They exist in Douglas County and near DIA](https://www.denverpost.com/2019/05/12/colorado-smart-communities-douglas-county-dia/) [.\(https://www.denverpost.com/2019/05/12/colorado-smart-communities-douglas-county-dia/\)](https://www.denverpost.com/2019/05/12/colorado-smart-communities-douglas-county-dia/), Joe Rubino
- [The smartest cities rely on citizen cunning and unglamorous technology](https://www.theguardian.com/cities/2014/dec/22/the-smartest-cities-rely-on-citizen-cunning-and-unglamorous-technology) [.\(https://www.theguardian.com/cities/2014/dec/22/the-smartest-cities-rely-on-citizen-cunning-and-unglamorous-technology\)](https://www.theguardian.com/cities/2014/dec/22/the-smartest-cities-rely-on-citizen-cunning-and-unglamorous-technology), Adam Greenfield
- [Clockwork City, Responsive City, Predictive City and Adjacent Incumbents](http://www.cityofsound.com/blog/2014/11/essay-clockwork-city-responsive-city-predictive-city.html) [.\(http://www.cityofsound.com/blog/2014/11/essay-clockwork-city-responsive-city-predictive-city.html\)](http://www.cityofsound.com/blog/2014/11/essay-clockwork-city-responsive-city-predictive-city.html), Dan Hill
- [Can Exchange Programs Help Bridge the Urban-Rural Divide?](https://www.citylab.com/life/2018/09/can-exchange-programs-help-bridge-the-urban-rural-divide/569137/) [.\(https://www.citylab.com/life/2018/09/can-exchange-programs-help-bridge-the-urban-rural-divide/569137/\)](https://www.citylab.com/life/2018/09/can-exchange-programs-help-bridge-the-urban-rural-divide/569137/), Sarah Baird
- [The city is my homescreen](https://medium.com/dark-matter-and-trojan-horses/the-city-is-my-homescreen-317673e0f57a) [.\(https://medium.com/dark-matter-and-trojan-horses/the-city-is-my-homescreen-317673e0f57a\)](https://medium.com/dark-matter-and-trojan-horses/the-city-is-my-homescreen-317673e0f57a), Dan Hill

COURSE POLICIES

Illness, emergencies, and other difficulties: If short term, non-emergency illnesses or other contingencies create problems with completing assignments, you must notify me by email before the assignment due date and provide documentation thereafter of your situation. I will only consider an extension in cases of a documented emergency if I receive notification prior to deadlines. Routine personal or business travel or other foreseeable responsibilities will not excuse late work. Please plan accordingly.

Note that if a serious difficulty arises, the best solution may be to withdraw from the course. Incomplete final grades are rarely given, and are reserved for the most extenuating of circumstances. Per university policy, incompletes can only be awarded when students have completed at least 75% of coursework.

Students with disabilities: I will make reasonable accommodations to students with documented disabilities. Please contact Disability Resources and Services at 303-556-3430 (TTY 303-556-4766) to arrange academic accommodations for this course. Additional information about the Disability Services Office can be found in "Additional Resources" below.

Academic Honesty: Academic honesty and integrity are vital elements of a dynamic academic institution. The responsibility for ethical conduct rests with each individual member of the academic community—students, faculty, and staff. UCD has an ongoing commitment to maintain and encourage academic integrity. Therefore, the University has created a set of standards of academic honesty and procedures governing violations of these principles. Copies of the Academic Honor Code document may be obtained at the University Library, from the SPA office, from the Student Services office, or from the Vice Chancellor's office. A self-paced online module can be accessed at:

<http://www.ucdenver.edu/academics/CUOnline/FacultyResources/AcademicHonesty/Documents/student/introduction/index.htm>. Please note that all assignments submitted as part of this course will be assessed for plagiarism using Turnitin.com, a service that compares student papers with Turnitin's database and internet sources.

Forms of Academic Dishonesty

1. Plagiarism: use of distinctive ideas or words belonging to another person, without adequately acknowledging that persons contribution.
2. Cheating: intentionally possessing, communicating, using, or attempting to use materials unauthorized by the instructor, information, notes, study aids, or other devices, in any academic exercise.
3. Fabrication and Falsification: intentional and unauthorized alteration or invention of any information or citation in an academic exercise.
4. Multiple Submissions: submissions of substantial portions of either written or oral academic work that has previously earned credit, when such submission is made without instructor authorization.
5. Misuse of Academic Materials: intentionally or knowingly destroying, stealing, or making inaccessible, library or other academic resource material.
6. Complicity in Academic Dishonesty: intentionally or knowingly contributing to the academic dishonesty of another.

These examples of academic dishonesty shall not be construed to be comprehensive. All infractions will be dealt with on an individual basis according to university policies and procedures. Moreover, it is the obligation of each student to assist in the enforcement of academic standards.

This policy is strictly enforced. I reserve the right to randomly review for plagiarism any paper and/or assignment that is submitted for a grade. Plagiarism review consists of running your paper/assignment through various search engines and databases at my disposal in order to check for "borrowed" or "bought" information. If you are found in violation of academic dishonesty, you will not pass this course. No exceptions. No second chances. No apologies.

Email Policy: All students enrolled in this course are required to use the official university-assigned email. Any emergency notices pertaining to the class will be distributed via email and via the Canvas website.

Questions and Concerns: You may ask questions and voice concerns to me throughout the semester. I suggest that you first pose questions by email or telephone. It is reasonable for you to expect a response within two working days.

SPA academic policies: It is your responsibility to understand and abide by the SPA academic policies found in the Handbook for the Master in Public Administration Program (available at <http://www.ucdenver.edu/academics/colleges/SPA/Academics/programs/PublicAffairsAdmin/Master/Documents/MPA%20Handbook.pdf> (<http://www.ucdenver.edu/academics/colleges/SPA/Academics/programs/PublicAffairsAdmin/Master/Documents/MPA%20Handbook.pdf>)).

UNIVERSITY WIDE POLICIES

University wide policies that are relevant to the syllabus:

Student Code of Conduct

<http://www.ucdenver.edu/life/services/standards/students/pages/default.aspx>

Accommodations

<http://www.ucdenver.edu/student-services/resources/disability-resources-services/accommodations/Pages/accommodations.aspx>

Academic Freedom

<http://www.ucdenver.edu/policy/pages/academic-Freedom.aspx>

Family Educational Rights and Privacy Act (FERPA)

<http://www.ucdenver.edu/student-services/resources/registrar/students/policies/Pages/StudentPrivacy.aspx>

Attendance

http://www.ucdenver.edu/faculty_staff/employees/policies/Policies%20Library/OAA/StudentAttendance.pdf

Discrimination and Harassment Policy and Procedures

<http://www.ucdenver.edu/about/WhoWeAre/Chancellor/ViceChancellors/Provost/StudentAffairs/UniversityLife/sexualmisconduct/DenverPolicies/Pages/Denver>

Grade Appeal Policy

<http://www.ucdenver.edu/policy/Documents/Process-for-Grade-Issues.pdf>

Fair Use

The materials on this course Web site are only for the use of students enrolled in this course for purposes associated with this course and may not be retained or further disseminated.

https://www.cusys.edu/ip/copyright/copy-exemptions_classroom.html

ADDITIONAL RESOURCES

SPA student services: Dawn Savage and Antoinette Sandoval are the liaisons for the School of Public Affairs Student Services. If you have questions concerning registration, adding/dropping courses, paperwork, financial aid, graduation, etc., please contact them directly. They are extremely knowledgeable and can assist you in your graduate process. Student Services' physical location is with the School of Public affairs. Alternatively, you can email either of them directly at dawn.savage@ucdenver.edu or antoinette.sandoval@ucdenver.edu.

Campus Assessment, Response & Evaluation (CARE): The CARE Team was created at the University of Colorado Denver Anschutz Medical Campus to address the health and safety needs of students as well as the campus community. The purpose of the team is to assess whether individuals pose a risk to themselves or others and to intervene when necessary and, more generally, to identify and provide assistance to those in need. The team takes a preventive approach to risk assessment by offering resources, referrals, and support to both the concerning individual and those impacted by their behavior.
<http://www.ucdenver.edu/CARE>

Auraria Library: The Auraria Library is a great resource for graduate students, with a vast collection of full-text online journals. In addition, the library also has resources such as Endnote Web, interlibrary loan, general and specialized databases, and an online librarian chat service. In order to access and use these e-resources you must secure a student ID number. The library staff provides trainings and assistance with using the online database for research. The website is: <http://library.auraria.edu/> [\(http://library.auraria.edu/\)](http://library.auraria.edu/)

University of Colorado Denver Writing Center: The UCD Writing Center is a free service that will assist you in building sound arguments and refining work appropriate at the graduate level. I strongly encourage you to utilize the resources available through the Writing Center. The website is:
<http://www.ucdenver.edu/academics/colleges/CLAS/Centers/writing/Pages/TheWritingCenter.aspx>
[\(http://www.ucdenver.edu/academics/colleges/CLAS/Centers/writing/Pages/TheWritingCenter.aspx\)](http://www.ucdenver.edu/academics/colleges/CLAS/Centers/writing/Pages/TheWritingCenter.aspx)

Disability services: To ensure disability-related concerns are properly addressed, students with disabilities who require assistance to participate in this class should contact the Office of Disability Resources and Services at 303-556-3450 to request accommodation. UCD is committed to provide reasonable accommodation and access to students with disabilities. In order to be eligible for accommodation, students must be officially registered with the Auraria Disability Services Office (DSO). The DSO staff works in an advisory capacity with students and faculty to develop reasonable instructional accommodations at the beginning of the semester to ensure full participation in academic programs. It is the responsibility of the student, not the instructor, to contact the DSO.

The course will fulfill the following objectives towards the universal competencies directed by the National Network of Schools of Public Policy and Administration (NASPAA)

NASPAA'S UNIVERSAL COMPETENCIES

NASPAA requires each accredited MPA program to deliver five Universal Competencies to its students. The programs are allowed to define each competency and determine the courses in which they will be delivered.

Introduction to Smart Cities will provide learning opportunities as follows:

To lead and manage in public governance

- The student understands the context of public and nonprofit management and how that context differs from private sector management
- The student is able to set mission-driven goals and use data, performance indicators, economic concepts and continuous improvement approaches to manage and lead in service of the mission

To participate in and contribute to the public policy process

- The student understands the process and context of policy making at all levels of democratic government
- The student understands and is able to apply tools for engaging citizens in the policy process
- The student is able to identify common barriers to effective implementation and how to overcome them

To analyze, synthesize, think critically, solve problems and make decisions

- The student is able to select and use appropriate research methods and analytical tools for collecting and analyzing data
- The student is able to find and synthesize existing data to inform decisions
- The student is able to critically assess, review, and understand research
- The student understands and is able to apply different perspectives and assumptions to generate policy and management decision alternatives
- The student understands the factors affecting the decision-making process and is able to select and use appropriate criteria and processes for making decisions



To articulate and apply a public service perspective

- The student understands and adheres to policies and practices advancing government and nonprofit transparency and accountability

To communicate and interact productively with a diverse and changing workforce and citizenry

- The student is able to partner effectively and work in teams to accomplish goals
- The student is able to communicate effectively in writing to a variety of audiences
- The student is able to communicate effectively in a spoken format to a variety of audiences
- The student understands the value of and can effectively incorporate citizen participation

Course Summary:

| Date | Details |
|------------------|---|
| Fri Aug 30, 2019 |  Short Presentation Topic Selection (https://ucdenver.instructure.com/courses/427041/assignments/747772) due by 11:59pm |
| |  Roll Call Attendance (https://ucdenver.instructure.com/courses/427041/assignments/744580) |