Intelligent Cities: Technology, Policy and Planning

Fridays, January 26 – May 7, 2018, 11 a.m. - 12:40 p.m.
25 West 4th Street, Room C-11

Instructor:
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Office hours Friday 1 p.m. – 3 p.m. (right after class) or by appointment, at Puck Building, Room 2303.

Course Overview

Global urbanization is driving demand for an estimated $40 trillion in infrastructure over the next two decades. At the same time information technology is spreading off the desktop and out of offices and homes into buildings, infrastructure and objects. As these two trends collide, a broad range of stakeholders -- the information technology industry, real estate developers, technology startups, citizens and civic leaders – are all looking for new opportunities to address both existing and emerging urban problems using “intelligent” systems. This course will explore the landscape of technologies being used in urban planning and policymaking today and will discuss:

- What are intelligent cities really?
- What are the intended and unintended potential consequences?
- What is the role of urban policy and planning in shaping their evolution?

The Spring 2018 edition of this course will focus on emerging topics in intelligent cities: data and predictive analytics, open data, citizen science, smart transportation and digital master planning.

Students are expected to have some basic knowledge of fundamentals of urban affairs. This is not a technology or engineering course – technical concepts will be explored during the lectures as needed to explain their significance for cities. Students are expected to do the required reading before class and be prepared to discuss the readings in class.

Plagiarism will result in a failing grade.

REQUIRED AND SUPPLEMENTAL READING Course Texts (Available at NYU Bookstore):


Additional Required Readings: There will be additional required reading(s) every week. All course readings are available for download on the NYU Classes site for this course.

COURSE WEBSITE
Publishing on Medium: To submit signals, news-focused writing assignments (detailed below), throughout the semester, you will need to setup an account on Medium (medium.com) Medium is a very simple system for web publishing; I’ll give a brief demo in the first class.
Once you have set up your account, please send me your username (sarahkaufman@nyu.edu) by January 31 so I can add you as a writer for this collection. Anything you post here will be public. Let me know if you are not comfortable with this and we can make other arrangements to submit signals.
The course publication (collection of writings) will be here:
http://medium.com/intelligent-cities
We will be curating submitted class signals into this collection.

ASSIGNMENTS & GRADING

Grading Breakdown:
Participation in class discussions – 15%
Future Signals - 25%
Policy Memo – 20%
Final Project – 40%

Participation in class discussions – 15%
Students must contribute to group discussions with ideas, reactions and questions indicating a thorough reading of assignments and engagement in class topics.

Future Signals (25% of overall grade)
For four classes, students must submit a “signal” of a recent development in intelligent cities, related to the reading and the upcoming week’s topic. Signals are submitted by posting them to your Medium account. Please email me (sarahkaufman@nyu.edu) once you’ve posted as confirmation.
Sign up for your signal weeks on this spreadsheet: http://bit.ly/IC_signals
***SIGNALS ARE DUE THURSDAYS AT NOON***

Description: A signal is a news item, research paper, photograph, video or other content that represents a direction of change or emerging trend. Each signal should contain a pointer to the document (a URL, or APA-style citation) and a 200-250 word (~1 page) synopsis highlighting the key development(s) in the signal and your interpretation of its significance for urban policy, planning or design.

Note that plagiarism is highly detectable and will result in penalty.

**Policy Memo (20% of grade)**
By Friday March 23rd, 5pm, students must submit a policy memo of 3 pages (double-spaced) recommending a policy problem be solved with:
- A specific data set, and why it was chosen
- Method of analyzing the data set
- Recommended actions based on data
- Assumed outcomes
- Potential challenges

Memos should be submitted via NYU Classes under Assignments section.

You are proposing a policy based on your original data analysis. Use a public data set and analyze it. Do not include the actual data in your memo, but rather charts or graphs that summarize the data, to help make the case for your policy recommendation.

Cite the data set and any other sources you use.

**Final paper (40% of grade)**
By May 11th, 5pm, students must submit a written position paper of 8-10 pages (maximum 2500 words plus images and illustrations) examining some aspect of the following topics:
- The use of data/big data in urban research involving universities, city governments, citizen scientists, or some combination of them.
- The practice of long-range technology planning in local government. Your paper must be based on original research (i.e. primary documents, interviews, or objects – not media or blog syntheses). It should be expository – making an argument about the efficacy or deficiency of some intelligent city
policy, planning or design issue or problem. Other kinds of design, technology or research projects will be considered by special request.

- Your work should be expository – making an argument about the efficacy or deficiency of some intelligent city policy, planning or design issue or problem. Other kinds of design, technology or research projects will be considered by special request. This project will also be presented in one of the last two class sessions (see below).
- **All work must be original.** Include data and literature sources in footnotes.
- **Final reports are due Friday, May 11th, by 5 p.m.** Papers must be submitted via NYU Classes.

**You will be required to make a 10 minute presentation of your work.** The presentation should summarize your major findings and feature your recommendation. Presentations will take place on one of the last two days of class (April 27 and May 4). Signups will occur later in the semester.

**CLASS FORMAT**
Each class will generally consist of: student sharing of signals, instructor lecture about weekly topic, class discussion, and tech demos. Several classes will have guest speakers working on the topics at hand. They will be announced before class; please come prepared with questions.

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CLASS SCHEDULE

January 26 (Week 1): Welcome; Course expectations; perspectives and assignments

Smart Cities and the Data Revolution: Past, Present and Future
Historical relationship between urbanization and information technology – contemporary urbanization – rise of ubiquitous computing – the “smart cities” movement – key stakeholders – model “smart cities” in Korea and Abu Dhabi – big urban data – emerging conflicts and precedents in 20th urban policy, planning and design.

Readings:
• *Smart Cities*: Preface, Introduction “Urbanization and Ubiquity”, & Ch. 1 “The $100 Billion Jackpot”
• *Beyond Transparency*, Ch. 1, “Open Data and Open Discourse at Boston Public Schools,” Ch. 2, “Open Data in Chicago: Game On”

Tech demos:
• Setting up a Medium blog.
• Video: 48 Hours on Citi Bike - http://www.citylab.com/commute/2014/04/48-madcap-hours-life-citi-bike/8778/

February 2 (Week 2): Technology and Government
***1st signal due by Thursday 2/1 at 12pm.***

Local government emergent role as master integrator of smart city solutions – Application areas for technology-enabled infrastructure, service delivery and governance solutions – Leading cities – Open government movement and open data – Long-range technology strategy and digital master planning.

Guest speaker: Jeffrey Nordhaus, Executive Vice President, Innovation & Broadband, Empire State Development Corporation

Required Readings:
• Townsend, Ch. 7, “Reinventing City Hall”
• *The Responsive City*, Foreword, Introduction.

Recommended Readings:
• *Beyond Transparency*, Ch. 4, “Lessons from the London Datastore"
• “Philadelphia leaders prioritize community while developing a smart city roadmap,” Smart Cities Dive.

February 9 (Week 3): Urban Automation & Predictive Analytics
Origins of cybernetics and computer simulation of cities and urban policy – the rise and fall of big urban models – evolution of GIS and planning support systems, decision-support systems – predictive urban analytics and big urban data – role of technology companies, think tanks, and universities as technical advisors to city governments – NYC MoDA.

Readings:
• Townsend, Ch. 2 “Cybernetics Redux”
• Beyond Transparency, Ch. 15 “Beyond Open Data: The Data-Driven City”
• The Responsive City, Ch. 4, “The City as Digital Platform”
• Predictive Analytics Primer, Mathworks.
  https://www.mathworks.com/discovery/predictive-analytics.html

February 16 (Week 4): Local government and the civic tech movement

Reading:
• Townsend, Ch. 4 “The Open-Source Metropolis” and Ch. 5 “Tinkering Towards Utopia”, Ch. 8 first section on “Summer of Smart”
• Beyond Transparency, Ch. 10, “Pioneering Open Data Standards: The GTFS Story,” Ch. 13, “Generating Economic Value Through Open Data”
• “The City as Platform,” The Aspen Institute, p 11-31

Guest speaker: Noel Hidalgo, BetaNYC Founder and civic tech activist

February 23 (Week 5): Data Analytics and governance
Incorporating output from data sources into policy recommendations and reports.

Readings:
• Beyond Transparency, Ch. 12, “The Beginning of a Beautiful Friendship: Data and Design in Innovative Citizen Experiences,” and Ch. 16, “Why Data Must Drive Decisions in Government”
• “Your City is Watching You: How machine learning and “computer vision” will transform our cities,” Curbed.


March 2 (Week 6): Citizen science
Unofficial data sources – Data accuracy and ethics – analysis - Sensors on people and infrastructure - Cell phone data - Social media analytics

Readings:
• Beyond Transparency, Ch. 11, “Making a Habit out of Civic Engagement: How the Culture of Open Data is Reframing Civic Life”
• All Tech Considered, “A Data Analyst's Blog Is Transforming How New Yorkers See Their City,” Dec 2014.

Recommended Reading:
“The citizen in the smart city. How the smart city could transform citizenship” on NYU Classes.

March 9 (Week 7): In-class data deep dive group exercise
Students will be presented with an urban policy issue. Working together, the class will investigate the issue using publicly accessible data and will map and communicate results. This exercise will be a model for the Policy Memo assignment. **Students must bring their own laptops to class with Microsoft Excel installed.**
Please contact the professor if laptop borrowing is needed.


March 16 (Spring Break – no class)

March 23 (Week 8), 5pm – Policy Memos due
Guest speaker (TBD)

March 30 (Week 9): Autonomous Vehicles
Planning for driverless cars from a technical, structural, policy, legal, and safety point of view.
Readings:
• Townsend, “Reprogramming Mobility”

Recommended Readings:
• “Imagining the Driverless City,” Patrick Kiger, Urban Land Magazine

April 6 (Week 10)
The Risks and Challenges of Intelligent Cities
Data ethics: anonymization, aggregations, privacy, inclusiveness and ownership.
Bureaucracy, aging infrastructure, climate change, workforce needs.

Required Readings:
• Townsend, Ch. 6, 9
• “The City as Platform,” The Aspen Institute, p 31-45

Recommended Readings:
• Technically Wrong, Sara Wachter-Boettcher.
• GothamGazette, “TLC’s Unintended Taxicab Confession,” June 25, 2014
• “Cisco Poised to Help China Keep an Eye on Its Citizens”, Wall Street Journal
• ”Why Quants Don’t Know Everything”, Felix Salmon for WIRED

Guest speaker: Shin-pei Tsay, Executive Director, Gehl Institute

April 13 (Week 11): Fostering urban innovation - startup city
What best practices are emerging, and how are they going to be identified and circulated. We’ll look at some of the emerging organizations that are harvesting, standardizing and cross-fertilizing good ideas for intelligent city policy, planning and design. We will also discuss how cities use economic development policy and urban planning to encourage the development of local technology innovation clusters.

Readings:
• Townsend, Ch. 8
• **Beyond Transparency**, Ch. 21, “New Thinking in How Governments Deliver Services”

Recommended readings:
- “Here be Startups: Exploring a Young Digital Cluster in Inner East London”

**April 20 (Week 12): Urban Innovation: New Leadership Roles & Networks for Cross-Fertilization**

Readings:
- **Beyond Transparency**, Ch. 22, “Open Data and Algorithmic Regulation”
- **The Responsive City**, Ch. 7, “Rethinking Government” and Ch. 8, “Toward Responsive Cities”
- “In New Civic Tech Hub, A Family Legacy of Community Building Continues,” GothamGazette

Guest speaker: Julie Samuels, Executive Director, Tech:NYC

**April 27 (Week 13): Presentations and Discussions; Intelligent Cities of the Future: Science and Design**

Readings:
Townsend, Ch. 10

**May 4 (Week 14)
Presentations and Discussions**

**Final papers due Friday, May 11th, by 5 p.m. Papers must be submitted on NYU Classes.**