

Taubman College of Architecture and Urban Planning  
Architecture 531  
Winter 2017  
Malcolm McCullough

*Course overview:*  
**Networked Cities**

**Background:** It's a boom! The smartgrid and the internet of things now interest a thousand times more players than they did just a few years ago. As mobile communications, embedded computation, sensate devices, and geocoded data have taken information technology beyond the desktop into the sites and situations of everyday life, smart city has become an especially sellable if misunderstood notion. The design challenge of urban computing unites the agendas of architecture and interaction design, aligns both of these disciplines on a more bottom-up, human centered process, and becomes one of the main cultural indicators of these times.

**Goals:** This course should help you understand the the relations of environment, technology, and human activity as they reshape the design challenge of the networked city. It should also help you understand these in a longer timeframe, both historical and moving forward. Through lectures, you will gain some exposure to several key issues and be invited to take a longer view. Through seminars, you will get a chance to take a position on several of these issues, and to discuss them in depth in an open setting. Through poster projects, you are invited to identify significant design opportunities, past and future.

**Requirements:** There are two main components to the course requirements: the seminar and a set of case study posters. Each is weighted equally toward the your course grade. In the seminar, regular and sensible participation is the main focus of the course. A printed paragraph of reading response helps support that, and it counted equally with spoken participation. In the posters, a set of three counts as half the course grade. By agreement of the group, we will do these individually or as partners. You are are asked to select a theme for these posters to share, so together they will form a set, and you will get a chance to show a draft of each so that as a group we may refine how these work.

**Enrollment:** There are no course prerequisites, but you must have strong conversational English. Participants from outside the architecture program are especially welcome, particularly from the School of Information. Our diverse skill set may include graphic communication, interface design, building technology, urbanism, network sociology, and technological history. All will come into play. No participant is expected to bring most of this; the course is about exposure and adaptation to these interrelated forms of design knowledge. The main benefit may be in the ability to read and write, and speak and listen, with and for people from related disciplines.

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## Schedule of Topics

- |      |                           |  |
|------|---------------------------|--|
| 1/10 | Overview:                 | Objectives, organization, scope, and format.<br>What is infrastructure? What is “smart city”?                                    |
| 1/17 | Seminar:<br>Workshop:     | Fritzsche: “Word City” and Henkin: “Word on the Streets”<br>Case study poster 1 (historic)                                       |
| 1/24 | Seminar:<br>Lecture:      | Cronon: “Pricing the Future: Grain” and Stilgoe: “Gateway”<br>Rail networks, Chicago   |
| 1/31 | Seminar:<br>Lecture:      | Nye: “Grid”<br>Electrical networks, 1920   |
| 2/7  | Seminar:<br>Presentation: | Levinson: “Radio: All Together Now”<br>and McCarthy: “Out of Home Networks”<br>Case study poster 1 (historic)                    |
| 2/14 | Seminar:<br>Lecture:      | Hughes: “The Evolution of Large Technological Systems”<br>The evolution of “American technological sublime”                      |
| 2/21 | Seminar:<br>Workshop:     | Castells: “The Space of Flows”<br>and Mitchell: “Recombinant Architecture”<br>Case study poster 2 (ethnographic)                 |
|      |                           | <i>(winter break)</i>  |
| 3/7  | Seminar:<br>Workshop:     | Hemment and Townsend: Smart Citizens and<br>Kontokosta: “What is Urban Informatics?”<br>Methods and goals for the case study set |
| 3/14 | Seminar:<br>Lecture:      | Forlano: “Toward an Integrated Theory of the Cyber-Urban”<br>Tangible media, at street level                                     |
| 3/21 | Seminar:<br>Presentation: | Solnit: “In the Day of the Postman”<br>Case study poster 2 (ethnographic)  |
| 3/28 | Seminar:<br>Workshop:     | Mattern: Interfacing Urban Intelligence and<br>Frei and Böhlen: “Micro Public Places.”<br>Case study poster 3 (entrepreneurial)  |
| 4/4  | Seminar:<br>Lecture:      | Picon: “The Limits of Intelligence and the Challenges Faced<br>by Smart Cities.”<br>Smartgrid, 2020                              |
| 4/11 | Seminar:<br>Workshop:     | Nye: “American Sublime”<br>Individual project consultations  |
| 4/18 | Presentation:             | Case study posters (all three, in exhibit format, with guests).  |

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### Poster Project

To stimulate seminar discussion and to provide an opportunity for some creative interpretation on a theme of ongoing interest to you, the course features a set of three poster exercises. At the start of the course, as a group we will decide whether to do these as individuals or in pairs. That depends somewhat on enrollment: if there is a good balance of participants from architecture with participants from other programs, that suggests working in pairs. The theme of this project is to be any one urban technology of your choosing, whether of mobility, energy, food, water, wayshowing, retail logistics, social assembly, historic commemoration, or anything else you want to propose. You will be asked to stay with this theme all semester, and to explore it in three different ways (*see below*). All will emphasize the illustration of situations, often at street level, with less focus the artifact itself and more on its cultural context. Quite often that context may include crossover to other infrastructures, as well as new layers on top of the older ones. Here, as throughout the course, the emphasis is on how infrastructure is made knowable, aesthetic, and usable primarily through its access points. Each of these three exercises will provide a detailed assignment, a workshop to discuss and develop a draft piece, and a presentation with 1–2 minute explanation of the motives behind each piece for a shared discussion of them all.

- Historic:* Identify and illustrate one experiential phenomenon or pattern of access points in the pre-digital history of a network infrastructure. In doing so, choose an infrastructure theme carefully, in anticipation of working with it all semester.
- Ethnographic:* Examine your chosen infrastructure's crossover with any one other infrastructure, perhaps an informational one, and do so with equal emphasis on social and technical shifts. Illustrate the situation of use, and how a shift of cultural perception, and perhaps a new type of identity of place comes with this.
- Entrepreneurial:* Compare and contrast any two recent technologies that alter the experience and cultural perception of your chosen infrastructure. These can be new takes on mainstream technologies, cool startups that you want to explore more closely, works of public interactive art, or particular smart building installations. Each should involve some tangible, physical component, with specific scale and spatial distribution, and not just be a smartphone app in communication with some faraway cloud. Do not just pick any two that you admire, but carefully so that the contrast and comparison will say something. Or (more work but fun), propose one of your own in comparison to an existing one.

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## Seminars

Discussions are the heart of this course. Many past participants have indicated that they seldom otherwise get such a good chance to read, write and discuss so regularly, openly, and at a high level. Please plan to do so. Each seminar meeting will respond to a selected short reading. To help focus your reading and response, and also to launch discussion, you are asked to prepare a half-page “claim” about the text, and to bring a printout of that to the seminar. This is so named to remind that it is not just a synopsis of what you just read, nor just your own reaction in your usual frame of reference to all things, but a specific point for discussion about where the text is coming from. At the seminar, response sheets are put in a physical inbox. Whenever the conversation needs a jump start (usually only at the beginning) anyone may randomly draw one of these statements and read it aloud.

In preparing a statement, you might find it helpful to work from these points of departure:

- 1: *Where is the author coming from, and why is that significant? This is the step that most people neglect: try to identify and assess the author's frame of reference; and don't just jump off into your own.*
- 2: *What is debatable in the text's essential thesis—what is the author saying, and how is that not just obvious but instead a basis for going deeper? What might be some expected main objection or qualification to that position?*
- 3: *Then in your own frame of reference, what specific example in this text got you thinking? What analogies did this text help you make?*

Remember that the purpose of this statement is to stimulate discussion. Prepare your remarks for your peers, knowing that they, too, are preparing remarks. Generally about 200 words works best, but this varies considerably.

These reading response printouts will be collected each week as a record of your participation. Twice, at mid- and end- semester you will receive some brief written feedback on the overall quality and consistency of these compilations. Together, that set counts 1/4 of the course grade.

Your regular participation in the conversations is likewise a quarter component of the course. This makes the course very difficult if English is not your first language, or if you are like, whatever, about speaking. In the dynamics and etiquette of the seminars, it is up to everyone to give everyone a chance to speak, to stay on topic, and not to let particular themes (or individuals) take over too frequently. Please be aware that having a real conversation each week is what makes this course valuable.

This is *your* seminar. Except to flag general digressions, the instructor will not speak for the first half of the discussion each week, and in the second half will only participate to guide the group further into the issues that it has raised.

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## Seminar Texts

First half: social history of technology

- 1 *Information deserves its own environmentalism...*  
“Word City.” Peter Fritzsche. Introduction to *Reading Berlin 1900*. Cambridge: Harvard University Press (1996), pp 1–11. Distracted citizens, long before smartphones.  
“Word on the Streets—Bills, Boards, and Banners.” David Henkin.. *City Reading—Written Words and Public Spaces in Antebellum New York*. New York: Columbia University Press (1998), pp 69–101. Environmental history of information.
- 2 *When railroads were the network technology ...*  
“Pricing the Future: Grain.” William Cronon. *Nature’s Metropolis*. New York: Grossman (1994), pp. 28–41. A classic of technological-environmental history, and perennial favorite in this seminar.
- 3 *The best past analogy to today’s pervasive computing is electrification...*  
“Grid” David Nye. *When the Lights Went Out*. Cambridge: MIT Press (2010), pp. 9–36. Electrification has commonly been cited as the best analogy for current challenges in pervasive computing.
- 4 *“Media studies” has usually meant critique of broadcast culture...*  
“Radio—All Together Now.” Paul Levinson. *The Soft Edge*. London: Routledge (1997) pp 78–90. From one of the better histories of information  
“Out of Home Networks in the 1990s.” Anna McCarthy.. *Ambient Television: Visual Culture and Public Space*. Durham: Duke University Press (2002), pp 89–114. Useful ethnography.
- 5 *The yin and yang of social construction and technological determinism*  
Thomas P. Hughes: “The Evolution of Large Technological Systems,” 1987 in Wiebe Bijker, Thomas P Hughes, and Trevor Pinch, eds. *The Social Construction of Technological Systems*. Cambridge: MIT Press (1987), pp 45–76. A classic volume in science/technology/society studies.
- 6 *Does the Internet melt anything it touches?*  
“The Space of Flows.” Manuel Castells. 1989. *The Informational City*. pp 167–171. The classic coinage from Castells’ early landmark work.  
“Recombinant Architecture” William Mitchell, 1994, *City of Bits*. The first in his early, influential set of three short books on techno-futures.

<winter break>

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## Seminar Texts

### Second half: smart city and its discontents

- 7 *A city is only as smart as its citizens...*  
“Perspectives.” Drew Hemment and Anthony Townsend, eds. *Smart Citizens*. Manchester UK: FutureEverything 2013. pp 5–19.  
“What is Urban Informatics?” Kontokosta, Constantine, et. al. Center for Urban Science and Progress (NYU). 2014. <http://cusp.nyu.edu/urban-informatics/> Smart cities, of a kind, have gone mainstream
- 8 *Digital-physical hybrids appear at street level...*  
Laura Forlano. “Toward an Integrated Theory of the Cyber-Urban: Digital Materiality and Networked Media at Multiple Scales. *Digital Culture & Society* (2015).
- 9 *Living with information superabundance (mental health break)...*  
“In the Day of the Postman.” Rebecca Solnit. Diary column, August 2013, London Review of Books. A literary master, on overconsumption.
- 10 *Access points become subject matter for design...*  
“Interfacing Urban Intelligence. Shannon Mattern. 2014. *Places Journal* <https://placesjournal.org/article/interfacing-urban-intelligence/>  
“Micro Public Places.” Hans Frei and Marc Böhlen. 2009. Architecture League of New York: *Situated Technologies*. A thoughtful typology.
- 11 *Not so fast...*  
“The Limits of Intelligence On the Challenges Faced by Smart Cities.” Antoine Picon. In *New Geographies 07: Geographies of Information*. Harvard GSD (2015).
- 12 *America at a crossroads...*  
“American Sublime.” David Nye. *American Technological Sublime*. Cambridge: MIT Press (1994).

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## Policies

- Grading:* Letter grades for the semester are according to standard college criteria: “A=Excellent, B=Good, C=Adequate, D=Poor, E=Inadequate, I=Incomplete.”  
The four equal components of the semester grade are described under Requirements above. They will each be graded check/plus/minus.
- Attendance:* At this point in your career, learning to manage your own time is more important than compliance with external rules for attendance. Nevertheless in a course that meets just once a week, it is unwise to miss consecutive sessions. If you know you will be doing so, it is a simple courtesy to email the instructor.
- Plagiarism:* Because this course will be interpreting found data, and sometimes doing so with open source tools, it will be important to acknowledge sources and to distinguish your own synthesis. The standard policy is this: “Plagiarism is knowingly presenting another person's ideas, findings, images or written work as one's own by copying or reproducing without acknowledgement of the source. It is intellectual theft that violates basic academic standards. In order to uphold an equal evaluation for all work submitted, cases of plagiarism will be reviewed by the individual faculty member and/or the Program Chair. Punitive measures will range from failure of an assignment to expulsion from the University.”
- Sharing:* Reuse and copy duty practices underlie many online communities, especially for learning. If you come up with something good, pass it along. If you find and use something made by others, credit them. If you modify a found resource, comment it appropriately.
- Verified needs:* “If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. Once needs are declared, we can work with the Services for Students with Disabilities (SSD) office to help us determine appropriate academic accommodations. SSD (734-763-3000; <http://ssd.umich.edu>) typically recommends accommodations through a Verified Individualize Services and Accommodations (VISA) form. Any information you provide is private and confidential and will be treated as such.”
- College policies:* As ever, you are expected to be familiar with and abide by the policies of Taubman College and the University of Michigan, on such matters as academic integrity, conduct, and use of the building and other resources:  
[http://taubmancollege.umich.edu/students/academic\\_policies/general/](http://taubmancollege.umich.edu/students/academic_policies/general/)

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## Resources

### UNIVERSITY NETWORK

- Canvas*: Reading matter, project assignments, and project links will be posted here.
- M+box*: Project PDFs should be posted here
- mail*: [networkedcities@umich.edu](mailto:networkedcities@umich.edu) for use by anyone, not just the instructor  
[mmmc@umich.edu](mailto:mmmc@umich.edu) please include [networked cities] prefix in subject line

### LINKS (SIX ESPECIALLY MISCELLANEOUS JUMPING-OFF POINTS)

- [www.citylab.com/](http://www.citylab.com/) Hosted by The Atlantic, and perhaps the most widely-read news feed on urbanism
- [www.situatedtechnologies.net](http://www.situatedtechnologies.net) A pamphlet series from the Architecture League of New York. Omar Khan, Mark Shepard, and Trebor Schulz, editors. 2007-2012.
- [senseable.mit.edu](http://senseable.mit.edu) MIT SenseABLE Cities Lab. A leading research unit.
- <https://www.greentechmedia.com/> Greentech Media. The most widely read smartgrid news feed.
- [cusp.nyu.edu](http://cusp.nyu.edu) Center for Urban Science and Progress. Case study, New York.
- [www.historyoftechnology.org](http://www.historyoftechnology.org) Society for the History of Technology.

### BOOKS (FOR HIGHER RESOLUTION)

- Nicholas Carr: *The Big Switch: Rewiring the World from Edison to Google*. New York: W. W. Norton, 2008. In an historical spirit similar to this course.
- William Cronon: *Nature's Metropolis*. New York: Grossman, 1994. A classic of technological-environmental history, and a favorite across Taubman College.
- Marcus Foth, Laura Forlano, Christine Satchell and Martin Gibbs, eds.: *From Social Butterfly to Engaged Citizen—Urban Informatics, Social Media, Ubiquitous Computing, and Mobile Technology to Support Citizen Engagement*. Cambridge: MIT Press, 2011. Probably the best recent anthology on networked cities.
- Stephen Goldsmith and Susan Crawford. *The Responsive City—Engaging Communities Through Data-Smart Governance*. New York: Wiley, 2014. A well-received work on the planning and policy perspective.
- Adam Greenfield. *Against the Smart City*. DO studio eBook (2013). A sharpest critique. Smokin'.
- David Nye. Start anywhere in the work of this prolific, influential social historian of technology.
- Lee Rainie and Barry Wellman. *Networked—The New Social Operating System*. Cambridge: MIT Press, 2012. Authoritative sociology from a director of the Pew Center.
- Anthony Townsend: *Smart Cities—Big Data, Civic Hackers, and the Quest for a New Utopia*. New York: W. W. Norton, 2013. A rich recent work from a well-placed futurist.