PH.D. GENERAL EXAM PROPOSAL

Massachusetts Institute of Technology, Department of Urban Studies and Planning

Name: Robert Goodspeed
Email: rgoodspe@mit.edu
Phone: 202-321-2743

Fields of Examination

Field 1: Urban Information Systems

Field 2: Democratic Land Use Planning

Written Examination

Proposal Dates: Friday, May 20 through Tuesday, May 24, 2011.
Number of Questions (asked/answered): Field 1 – 3/2; Field 2 – 3/2

Oral Examination

Proposed date: Wednesday, June 1.

Examination Committee

Chair: Joseph Ferreira, Jr., Professor of Urban Planning and Operations Research

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Member: Michael Flaxman, Assistant Professor of Urban Technologies and Information Systems

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Member: Brent Ryan, Assistant Professor of Urban Design and Public Policy

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Submission Date: _____

FIRST FIELD: URBAN INFORMATION SYSTEMS IN PLANNING

1. Information Technology and Knowledge Management and Representation

Information Technology and Management captures the computing branch within UIS. The area of information technology and knowledge management and representation draws on computer science and the management of information systems (MIS) to deal with issues of structuring, storing and manipulating the information in ways that is manageable and suitable for planning. In particular this core area analyzes how Geographic Information Systems (GIS) and Data Base Management Systems (DBMS) technology can be used to support planning strategies.

Subsections of Information technology and knowledge management are:

(1) Geographic Information Systems (GIS) and Geospatial Services
(2) Database Design and Management, and Programming
(3) Information Technology and Planning Support Systems

(1) Geographic Information Systems (GIS) and Geospatial Services

From stand-alone GIS programs (mainframe-based GIS and desktop GIS), to Local Area Network based GIS, GIS has become one of the most important tools in a planner's tool kit. With the explosive development of the internet, organizations are choosing to extend their desktop GIS implementations with server-based GIS solutions that offer content and capabilities via Web services. Web services provide the building blocks upon which broader IT strategies are based, such as the implementation of a service-oriented architecture (SOA). SOA is a style of information systems architecture that enables the creation of applications that are built by combining loosely coupled and interoperable services. With web service-based SOA, organizations can integrate GIS into their existing workflows and solve today's challenges of providing open access to common geospatial data, services, and applications from within their organizations and beyond.

<u>Books</u>

DeMers, Michael N. 2000. *Fundamentals of geographic information systems.* New York: J. Wiley.

Huxhold, William E. 1991. *An Introduction to Urban Geographic Information Systems.* Oxford, UK: Oxford University Press.

Longley, Paul, Michael Goodchild, David Maguire, and David Rhind. 2005. *Geographic Information Systems and Science*. 2nd ed. Chichester: Wiley.

Miller, Harvey J., and Jiawei Han. 2001. *Geographic Data Mining and Knowledge Discovery.* New York: Taylor & Francis.

Monmonier, Mark S. 1996. *How to Lie with Maps*. 2nd ed. Chicago: University of Chicago Press.

O'Sullivan, David, and David Unwin. 2003. Geographic Information Analysis, John Wiley & Sons, New Jersey.

Peng, Zhong-Ren and Ming-hsiang Tsou. 2003. *Internet GIS: Distributed Geographic Information Services for the Internet and Wireless Networks*. Hoboken, N.J.: Wiley.

Worboys, Michael, and Matt Duckham. 2004. *GIS : A Computing Perspective*. 2nd ed. Boca Raton: CRC Press.

Articles

Batty, Michael. 2002. A Decade of GIS: What Next? *Environment and Planning B* Vol. 29, No.2, 157-158.

Drummond, William J., and Steven P. French. 2008. The Future of GIS in Planning: Converging Technologies and Diverging Interests. *Journal of the American Planning Association* 74 (2):161 - 174.

Ferreira, Joseph. 2008. Comment on Drummond and French: GIS Evolution: Are We Messed Up by Mashups? *Journal of the American Planning Association* 74 (2):177 - 179.

Ferreira, Joseph, Mi Diao, Yi Zhu, Weifeng Li, and Shan Jiang. 2010. Information Infrastructure for Research Collaboration in Land Use, Transportation, and Environmental Planning. In *Transportation Research Board*. Washington, D.C.

Heikkila, Eric J. 1998. GIS is Dead: Long Live GIS! *Journal of American Planning Association* 64: 350-360.

Holmberg, S.C. 1994. Geoinformatics for Urban and Regional Planning. *Environment and Planning B* 21: 5-19.

Klosterman, Richard E. 2008. Comment on Drummond and French: Another View of the Future of GIS. *Journal of the American Planning Association* 74 (2):174 - 176.

Nedovic-Budic, Zorica. 2000. "Geographic Information Science Implications for Urban and Regional Planning," *URISA Journal* 12: no. 2, pp. 81 -93.

(2) Database Design and Management, and Programming

From flatfile systems such as excel to dBase in the 1980s, to the more recent object relational data model system (e.g. Oracle or SQL server), to spatially referenced databases, database technology has helped planners to accumulate information and knowledge. In addition, database systems support exploration, analysis, and on-demand querying of complex datasets to answer research and operational questions. This section covers database design and management issues, including database models, distributed computing, data structure, and multi-user and multidimensional issues as well as its application in planning, structured/unstructured data and the related search issues, and finally covers object-oriented programming. New web-based

technologies for information manipulation and sharing are increasingly developed on server-side database technologies such as SQL, making an understanding of underlying database technology even more important.

Books

Samet, H. 1990. *The Design and Analysis of Spatial Data Structures.* Reading, MA: Addison-Wesley.

Bagui, Sikha and Richard Earp. 2003. *Database Design Using Entity-Relationship Diagrams*. Boca Raton: GL, Auerbach.

Rob, Peter and Carlos Coronel. 2004. *Database Systems: Design, Implementation, and Management*. 6th ed. Boston, Mass.: Thomson/Course Technology.

Date, C. J. 2004. *An Introduction to Database Systems*. 8th ed. Boston: Pearson/Addison Wesley.

Loney, Kevin. 2009. *Oracle Database 11g: The Complete Reference*. San Francisco: McGraw-Hill Companies.

Horstmann, Cay S. 2008. *Big Java*. 3rd ed. Hoboken, N.J.: John Wiley.

Articles

Cao, L., and J. Ferreira. 2001. Integrating GIS and RDBMS to Model Traffic Congestion and Urban Air Pollutants. *Urban and Regional Systems Association Proceedings,* Long Beach, CA, pp. 678-688.

Devogele, T., C. Parent, and S. Spaccapietra. 1998. On Spatial Database Integration. *International Journal of Geographical Information Science* 12, no. 4, 335-352.

Ferreira, J. 1990. Database Management Tools for Planning. *Journal of the American Planning Association* 56: 78-84.

(3) Information Technology and Planning Support Systems and Knowledge Management

This section covers artificial intelligence, the application of information technology in planning, and the development Planning Support Systems. This section relates to underlying urban models (economic, agent-based, ecological, etc). However in general these articles focus on the institutional and functional design and use of such systems. Articles focusing on the underlying analytical models are contained in the following section.

The concept of "planning support systems" developed in the late 1980s as desktop computing grew in sophistication and GIS became integrated into professional practice. Early scholars emphasized the ability of spreadsheets to create simple models for decision support and analysis (Brail 1987). Others observed systems needed for planning did not align with commercially available tools (Leclercq 1990; Webster 1993) and PSS developed along parallel paths. Some emphasized the potential of GIS systems for visual representation, while others

sought to develop customized systems integrating GIS and domain-specific analytical models to answer policy questions, which links to the literature on large-scale urban models. Finally, practitioners developed a suite of static models suitable for scenario planning, such as INDEX, CommunityViz, and What If?, described in Brail (2008). Although static and computationally limited, these tools are also highly understandable to professionals and the public and their development has been uneven as a tension exists between the scope of planning and the specific functionality included within them.

Books

Brail, Richard K. 2008. *Planning Support Systems for Cities and Regions*. Cambridge, Mass.: Lincoln Institute of Land Policy.

Brail, Richard K., and Richard E. Klosterman. 2001. *Planning Support Systems : Integrating Geographic Information Systems, Models, and Visualization Tools*. Redlands, Calif.: ESRI Press.

Brail, R. K. 1987. *Microcomputers in Urban Planning and Management*. New Brunswick, NJ: Center for Urban Policy Research.

Articles

Batty, Michael. 1992. Urban Modeling in Computer-Graphic and Geographic Information System Environments. *Environment and Planning B* 19: 663-688.

Davis, R., Shrobe, H., and Szolovits, P. 1993. What is a Knowledge Representation? *AI Magazine* 14, 17-33.

Doyle, S., M. Dodge, and A. Smith. 1998. The Potential of Web-based Mapping and Virtual Reality Technologies for Modeling Urban Environments. *Computers, Environment and Urban Systems* 22(2): 137-155.

Edamura, T., ans T. Tsuchida. 1999. Planning Support System for an Urban Environment Improvement Project. *Environment and Planning B* 26: 381-391.

Harris, B. 1989. Beyond Geographic Information Systems: Computers and the Planning Professional. *Environment and Planning B* 26: 381-391.

Hopkins, Lewis D. 1999. Structure of a Planning Support System for Urban Development. *Environment and Planning B* 26: 333-343.

Janssen, R., M. van Herwijnen, T. J. Stewart, and J. C. J. H. Aerts. 2008. Multiobjective decision support for land-use planning. *Environment and Planning B: Planning and Design* 35 (4):740-756.

Janssen, R., and T. J. Stewart. 2009. Making progress towards effective spatial decision support:

a response from Janssen and Stewart. *Environment and Planning B: Planning and Design* 36 (1):8-11.

Klosterman, R. E. 1990. Microcomputers in Urban and Regional Planning: Lessons from the Past, Directions for the Future. *Computers, Environment, and Urban Systems* 14(3): 177-185.

Klosterman, R.E. 1997. Planning Support Systems: A New Perspective on Computer- Aided Planning. *Journal of Planning Education and Research* 17, 45-54.

Leclercq, F. 1990. Information Supply to Strategic Planning. *Environment and Planning B* 17: 429-440.

Rubenstein-Montano, B. 2000. A Survey of Knowledge-Based Information System for Urban Planning: Moving towards Knowledge Management. *Computers, Environment, and Urban Systems* 24: 155-172.

Shiffer, M.J. 1992. Towards a Collaborative Planning Systems. *Environment and Planning B* 19, 709-722.

Shiffer, M.J., 1995. Interactive Multimedia Planning Support: Moving From Stand-alone Systems to the World Wide Web. *Environment and Planning B* 22: 649-664.

Te Brömmelstroet, M. 2009. The relevance of research in planning support systems: a response to Janssen et al. *Environment and Planning B: Planning and Design* 36 (1):4-7.

Te Brömmelstroet, M., and P. M. Schrijnen. 2009. From planning support systems to mediated planning support: a structured dialogue to overcome the implementation gap. *Environment and Planning B: Planning and Design* 37 (1):3-20.

Webster, C.J. 1993. GIS and the Scientific Inputs to Urban Planning. Part 1: Description. *Environment and Planning B* 20: 709-728.

2. Analytical Methods and Urban Models

Analytical methods and urban models draw upon the methodologies of Operations Research (probability models), statistics, and econometrics, while applying social and economic theory. In general, this section entails two major contents. The first covers quantitative methods, such as probability models, discrete choice analysis, econometrics, and statistical inference, and their application in urban studies and planning. The second focuses on urban economics and spatial models.

Readings cover economic theories linked with models that explore economic activities in the spatial context of metropolitan areas. Particular attention is paid on the interaction between land use and transportation, urban economics, and real estate markets. Two types of operational models are developed to address the real world planning practice: (a) mathematic programming

models, which are used to find out the optimal location of facilities, service delivery and even the optimal spatial pattern of the metropolitan area; and (b) large-scale urban models, which are developed combining economic theory, statistics and spatial analysis techniques.

(1) Analytical Methods: Statistics, Probability, and Spatial Measurement and Analysis

This section includes foundational texts in applied probability, urban operations research, and statistical inference. Also included are specialized analysis techniques for the measurement of urban form, spatial analysis techniques, and the construction of indicators.

Books

Bailey, Trevor C., and Anthony C. Gatrell. 1995. *Interactive Spatial Data Analysis.* Essex, UK: Pearson Education Limited.

Ben-Akiva, M., and S. R. Lerman. 1985. *Discrete Choice Analysis.* Cambridge, MA: MIT Press.

Casella, G and R.L. Berger. 2002. *Statistical Inference*. 2nd ed. Duxbury Press.

Keeney, Ralph L., and Howard Raiffa. 1976. *Decisions with Multiple Objectives: Preferences and Value Tradeoffs.* New York: John Wiley and Sons.

Krueckenberg, D.A., and A.L. Silvers. 1974. *Urban Planning Analysis: Methods and Models.* New York: Wiley Press.

Larson, Richard C., and Amedeo R. Odoni. 2007. *Urban Operations Research*. Belmont, Mass.: Dynamic Ideas.

Pindyck, Robert S. and Daniel L. Rubinfeld. 1998. *Econometric Models and Economic Forecasts*. 4th ed. New York, The McGraw-Hill Companies.

Shannon, Robert E. 1975. *Systems Simulation: The Art and Science*. Englewood Cliffs, N.J.: Prentice-Hall.

Articles

Arentze, T. A., A. W. J. Borgers, L. Ma, and H. J. P. Timmermans. 2010. An agent-based heuristic method for generating land-use plans in urban planning. *Environment and Planning B: Planning and Design* 37 (3):463-482.

Ben-Akiva, M., and N. Litinas. 1985. " Continuous Spatial Choice: The Continuous Logit Model and Distributions of Trips and Urban Densities," *Transportation Research A*, 19a, pp. 119-154.

Clarke, K.C., and E.A. Silva. 2001. Complexity, Emergence, and Cellular Urban Models: Lessons Learned from Applying SLEUTH to two Portugal Cities. Presented at *ACSP*, Cleveland, OH.

Logsdon, M.G., E.J. Bell, and F.V. Westerlund. 1996. Probability Mapping of Land Use Change: A GIS Interface for Visualizing Transition Probabilities. *Computers, Environment, and Urban Systems* 20(6): 389-398.

Longley, Paul, and Victor Mesev. 2000. On the measurement and Generalization of Urban Form. *Environment and Planning A* 32(3): 473-488.

Malpezzi, Stephen, and Wen-Kai Guo. 2001. Measuring "Sprawl": Alternative Measures of Urban Form in U.S. Metropolitan Areas, working paper of The Center for Urban Land Economics Research, The University of Wisconsin.

Sawicki, D.S., and P. Flynn. 1996. Neighborhood Indicators: A Review of the Literature and An Assessment of Conceptual and Methodological Issues. *Journal of the American Planning Association* 66: 165-183.

Shen, Qing. 1996. Spatial Impacts of Locally Enacted Growth Controls: the San Francisco Bay Area in the 1990s. *Environment and Planning B* 23: 61 -91.

Talen, E., and L. Anselin. 1998. Assessing Spatial Equity: An Evaluation of Measures of Accessibility to Playgrounds. *Environmental and Planning A* 30(4): 595-613.

Wong, David W.S. 2001. Implementing Spatial Segregation Measures in GIS. *Computers, Environment, and Urban Systems* 27(3): 53-70.

Zhang, Z., and D.A. Griffith. 1997. Developing User-friendly Spatial Statistical Analysis Modules for GIS: An Example Using Arcview. *Computers, Environment, and Urban Systems* 21(1): 5-29.

(2) Economic Theory

This section contains theoretical work related to the urban land and labor markets which define urban systems. These include Alonso's classic monocentric model and adaptations for multiple centers, decentralization, and mixed land uses.

<u>Books</u>

Alonso, William. 1964. *Location and Land Use: toward a General Theory of Land Rent*. Cambridge, Mass.: Harvard University Press.

DiPasquale, Denise and William C. Wheaton. 1995. *Urban Economics and Real Estate Markets*. Englewood Cliffs, NJ: Prentice Hall.

Fujita, Masahisa, Paul Krugman, and Anthony Venables. 1999. *The Spatial Economy: Cities, Regions, and International Trade*. Cambridge, Mass.: The MIT Press.

Nicholson, Walter. 2004. *Intermediate Microeconomics and its Application*s. 9th ed. Mason, Ohio: Thomson/South-Western.

O'Sullivan, Arthur. 2007. *Urban Economics*. Homewood, IL: Irwin.

Treyz, George. 1993. *Regional Economic Modeling: A Systematic Approach to Economic Forecasting and Policy Analysis*. Boston: Kluwer Academic Publishers.

Articles

Wheaton, William C. 1998. Land Use and Density in Cities with Congestion. *Journal of Urban Economics* 43(2): 258-272.

Wheaton, William C. 1977. Residential Decentralization, Land Rents, and the Benefits of Urban Transportation Investment. *American Economic Review* 67(2).

Anas, A and R Xu. 1999. Congestion, Land Use, and Job Dispersion: A General Equilibrium Model. *Journal of Urban Economics* 45: 451-473.

Gabiax, Xavier. 1999. Zipf's Law for Cities: An Explanation. *Quarterly Journal of Economics* 739-768.

Galster, George C. 1977. A Bid-Rent Analysis of Housing Market Discrimination. *American Economic Review* 67(2): 144-155.

McMillen, D. and S. Smith. 2003. The Number of Subcenters in large Urban Areas. *Journal of Urban Economics* 53(3): 321-339.

Wheaton, William. 2004. Commuting, Congestion and Employment Dispersal in Cities with Mixed Land Use. *Journal of Urban Economics* 55(3): 417-438.

(3) Large-scale urban models

Large-scale urban models attempt to simulate real-world urban dynamics in various ways. Models developed using spatial theories simulate growth through cellular automata, where land use changes are simulated as spatial phenomenon. Similarly raster modeling approaches such as ATTCON can capture land market dynamics by taking the demand and types of housing as fixed inputs, and allocated uses through an iterative process across multiple time steps. Integrated land use and transportation models seek to capture the interaction between changes in transportation infrastructure and land use patterns. The most sophisticated research model, UrbanSim, simulates land markets and travel behavior at the individual level. Large-scale models have been critiqued, most notably by Douglass Lee (1973, 1994), for being expensive, data hungry "black boxes" lacking transparency and therefore policy utility. Perhaps more seriously, the most complicated models have an uncertain relationship with policy since their outputs are associated with a good deal of uncertainty. Advocates argue this form of modeling is needed to capture system dynamics seen in reality (Harris and Batty 1993; Waddel 2001). In addition, new

sources of spatially disaggregate data and increasingly rich urban economic theories mean they may persist as tools for research and policy development.

Two of the most active supporters of modeling, Harris and Batty, wrote in 1993 that any model has four interrelated theories: theories of computation, social and functional theories of systems being planned, and the theory of planning, and theory of spatial representation or description. Although they remain committed to the need for modeling for optimization, the normative description of such a system is formidable indeed: self-teaching, accessible inputs and outputs, supporting a range of uses, among others. For this reason it seems likely both large-scale models and sketch planning tools described above will continue to proceed in parallel.

Books

Brail, Richard K., and Richard E. Klosterman. 2001. *Planning support systems : integrating geographic information systems, models, and visualization tools*. Redlands, Calif.: ESRI Press. (repeated from above)

Articles

Batty, Michael. 1994. A Chronicle of Scientific Planning: The Anglo-American Modeling Experience. *Journal of the American Planning Association* 60: 7-16.

Batty, Michael, and Yichun Xie. 1994. Modeling Inside GIS: Part 1. Model structures, Exploratory Spatial Data Analysis and Aggregation. *International Journal of Geographical Information Systems* 8: 291-307.

Batty, Michael, and Yichun Xie. 1994. Modeling inside GIS: Part 2. Selecting and Calibrating Urban Models Using ARC/INFO. *International Journal of Geographical Information Systems* 8: 451-470.

Brail, Richard. 1989. Integrating Information Systems and Spatial Models. Rutgers University. lnternational Conference on Computers in Urban Planning and Urban Management.

Boyce, David E. 1988. Presidential Address: Renaissance of Large-Scale Models. Papers of the Regional Science Association 65: l-10.

Flaxman, Michael, and Weifeng Li. 2009. Urban Growth Models as Web Services. In *CUPUM 2009*.

Guhathakurta, S. 1999. Urban Modeling and Contemporary Planning Theory: Is There a Common Ground? *Journal of Planning Education and Research* 18(4): 281-292.

Harris, Britton and Michael Batty. 1993. Location Models, Geographical Information and Planning Support Systems. *Journal of the American Planning Association* 55(1): 85-90.

Harris, Britton. 2001. Sketch Planning: Systematic Methods in Planning and Its Support. In Brail, R.K. and R.E. Klosterman. (Eds.) *Planning Support Systems,* Redland, CA: ESRl Press.

Klosterman, R.E. 1999. The What If? Collaborative Planning Support System. *Environment and Planning B* 26: 393-408.

Klosterman, R.E. 1994. An Introduction to the Literature on Large-Scale Models. *Journal of the American Planning Association* 60(1): 41-44.

Landis, John D., and M. Zhang. 1998a. The Second Generation of the California Urban Future Model. Part 1: Model Logic and Theory. *Environment and Planning B* 25: 657-666.

Landis, John D., and M. Zhang. 1998b. The Second Generation of the California Urban Future Model. Part 2: Specification and Calibration Results of the Land-Use Change Submodel. *Environment and Planning B* 25: 795-824.

Lee, Douglass B. 1973. Requiem for Large-Scale Models. *Journal of the American Planning Association* 39 (3):163.

Lee, Douglass B. 1994. Retrospective on Large-Scale Urban Models. *Journal of the American Planning Association* 60 (1):35.

Waddell, Paul. 2001. Between Politics and Planning: UrbanSim as a Decision-Support System for Metropolitan Planning. In Brail, R.K. and R.E. Klosterman. (Eds.) *Planning Support Systems,* Redland, CA: ESRI Press

Waddell, P. 2002. UrbanSim: Modeling Urban Development for Land Use, Transportation and Environmental Planning. *Journal of American Planning Association* 68: 297-314.

Wegener, M. 1994. Operational Urban Models: State of the Art. *Journal of the American Planning Association* 60(1): 17-29.

3. Institutions and Organizational Behavior

This part examines the institutional environment of planning, with the aim of developing a broad understanding of the organizations and planning processes within which information technologies are brought to bear. The literature focuses on organizational and institutional implications of information technology. It draws from the readings on planning theory, sociology, anthropology, and political science. This section's readings cover topics such as: what impacts will information technology have on cities, organizations, institutions, and social processes within which planning takes place; how can planners integrate information technology into these organizations, institutions and social processes.

In an organizational context it draws on institutionalism (Fountain 2001) and technology adoption theories (Innes and Simpson 1993). In some cases, new online practices spark new

theories, such as Brabham's proposal for "crowdsourcing" as a new participation paradigm (2009). Finally, other scholars have worked at the interface of technical analysis and social meaning, drawing on Habermas theory of communicative action to identify the process whereby indicators are constructed.

In the professional domain, a discourse of technology inevitably improving efficiency and decision-making is prevalent. Ventura (2002) argues this information based improved a community's ability to plan for change, and implicit in Greene (2000) is how GIS enables policymakers to craft policies with more nuance and effectiveness, in the case of targeting parcels to maximize protection of Boston's drinking water. Mandelbaum provides a theoretical view in the middle range. The creation of professional tools are intimately linked with the definition of problems, therefore they are made embedded in specific contexts and may be "broken" if they no longer command agreement as to their relevance (1996). Dealing with information technology more broadly, other theorists have proposed more deeply seated and more subtle changes. Castells argues IT enables a transformation of social power where the ability to draw attention is required (1989, 2007), and Mitchell stressed the impact on daily life (1995). At the organizational level, Zuboff proposes a fundamental transformation whereby information technology can result in an "informated" organization with transformed roles for managers and workers alike (1998).

(1) Institutions and Social Processes

Books

Castells, Manuel. 1989. *The Informational City: Information Technology, Economic Restructuring, and the Urban-Regional Process*. Cambridge, Mass.: Blackwell.

Fountain, Jane. 2001. *Building the Virtual State: Information Technology and Institutional Change* (Chapter 1). Washington D.C: Brookings Institution Press.

Greene, R.W. 2000. *GIS in Public Policy*. Redland, California: ESRI Press.

Mitchell, William J. 1995. *City of Bits: Space, Place, and the Infobahn*. Cambridge, Mass.: MIT Press.

Zuboff, S. 1998. *In the Age of the Smart Machine: The Future of Work and Power*. New York: Basic Books.

Articles

Autor, David. 2010. U.S. Labor Market Challenges over the Longer Term. Working Paper, MIT Department of Economics and NBER.

Batty, M. 1990. Invisible Cities. *Environmental and Planning B* 17: 127-130.

Brabham, Daren C. 2009. Crowdsourcing the Public Participation Process for Planning Projects. *Planning Theory* 8(3):242-262.

Budic, Z. Effectiveness of Geographic Information Systems in Local Planning. *Journal of the American Planning Association* 60(2): 244-263.

Castells, M. 2007. Communication, power and counter-power in the network society. *International Journal of Communication* 1(1):238-266.

Ferreira, Joseph Jr. 1998. Information Technologies that Change Relationships between Low-Income Communities and the Public and Non-profit Agencies that Serve Them. In *High Technology and Low-Income Communities: Prospects for the Positive Use of Advanced Information Technology*, eds, D. Schon, W. Mitchell, and B. Sanyal, Cambridge, MA: MIT Press.

Gaspar, J., and E. L. Glaeser. 1998. Information technology and the future of cities. *Journal of Urban Economics* 43 (1):136-156.

Göçmen, Z. Aslıgül and Stephen J. Ventura. 2010. Barriers to GIS Use in Planning. *Journal of the American Planning Association* 76(2):172 - 183.

Holden, M. 2000. GIS in Land Use Planning: Lessons from Critical Theory and the Gulf Islands. *Journal of Planning Education and Research* 19: 287-296.

Innes, J.E., and D.M. Simpson. 1993. Implementing GIS for Planning: Lessons from the History of Technological Innovation. *Journal of the American Planning Association* 64(1): 230-236.

Mandelbaurn, Seymour J. 1996. Making and Breaking Planning Tools. *Computer, Environment and Urban Systems*, 20(7): 1-84.

Ventura, SJ, BJ Niemann, TL Sutphin, and RE Chenoweth. 2002. GIS-enhanced land-use planning. In *Community participation and geographic information systems*, ed. William Craig, et al, 2002. New York: Taylor & Francis.

(2) Data Policy, Infrastructure and Standards

IT has enabled greater data sharing among various institutions. Formal government institutions which produce government datasets, but also increasingly private actors are producing data freely available through APIs or other means online. This section concerns the policies governing which data is shared, in what formats, and what supplementary practices such as metadata are required to maximize usefulness.

The Open GIS Consortium has led efforts to develop open interfaces at the software level to enable system interoperability at the parameter, command, and data type level (McKee 2000). This work complements efforts to standardize data formats and metadata. The motivations for these systems are manifold, and can relate to supporting tools for planning and policymaking, or managerial information needs. Older paradigms treat this data as a neutral infrastructure, supporting economic development, research, and policy development (National Research

Council 1993; MassGIS Council 2007). In this vein, programs of data infrastructure development are proceeding, including standardization of data collection, metadata, formats, and governance. In the EU the INSPIRE process, the result of EU legislation passed in 2007, hopes to create a spatial data infrastructure across the member states by 2019.

Other purposes for government data have been proposed. Fung, Graham, and Weil have proposed a model of targeted transparency (Fung, et al 2007) where information itself is used as a policy tool by governments, Robinson and Noveck argue for releasing data to realize broad public benefits including economic effects, and Davies (2010) finds empirical evidence for a range of uses: for facts, information, interfaces, derivative data, and services.

Books and Reports

Fung, Archon, Mary Graham, and David Weil. 2007. *Full disclosure : the perils and promise of transparency*. New York: Cambridge University Press.

Massachusetts Geographic Information Council Strategic Plan Steering Committee. 2007. A Strategic Plan for Massachusetts' Spatial Data Infrastructure. Boston, MA.

National Research Council. 1993. *Toward a Coordinated Spatial Data Infrastructure for the Nation.* National Academy Press: Washington, DC.

Noveck, Beth Simone. 2009. *Wiki government : how technology can make government better, democracy stronger, and citizens more powerful*. Washington, D.C.: Brookings Institution Press.

Onsrud, H.J., and G. Rushton eds. 1995. *Sharing Geographic Information.* New Brunswick, NJ: Rutgers, The State University of New Jersey.

Articles

Davies, A, and D Lithwick. 2010. Government 2.0 and Access to Information: 2. Recent Developments in Proactive Disclosure and Open Data in the United States and Other Countries. Library of Parliament (Canada) Background Paper No. 2010-15-E.

Davies, Tim. 2010. Open data, democracy and public sector reform : A look at open government data use from data.gov.uk. Master's Thesis, University of Oxford, Oxford, England.

Dangermond, J. 1988. "Who Is Designing Geographic Information System for the Public?" Paper read at Urban and Regional Information Systems Association, August 1988 3: 37-45.

Dawes, Susan. 2010. Information policy meta-principles: stewardship and usefulness. Paper read at 43rd Hawaii International Conference on System Sciences.

Day, P, and C Maene. 2006. Legal Considerations in the Dissemination of Licensed Digital Spatial Data. *Library Trends* 55(2):236-253.

McKee, Lance. 2000. Implications of the OpenGlS Specification for Regional Science. *Open GIS Consortium White Paper.*

Robinson, David G., Harlan Yu, William P. Zeller, and Edward W. Felten. 2009. Government Data and the Invisible Hand. *Yale Journal of Law & Technology* 11:160.

Singh, Raj. 2003. Speaking the Same Language: Using XML for Distributed and Collaborative Planning Analysis and Modeling. In *ACSP/AESOP*.

(3) PPGIS, Visualization, and the Epistemology of GIS Practice

The field of PPGIS emerged in the 1990s. As GIS technology developed, its use for mapping and analysis required operator skills and access to data. Practitioners observed that digital datasets often came from government or corporate sources, therefore mapping technologies that relied on these sources reflected the priorities and values of the data creators, not necessarily the data users. PPGIS sought to modify this situation in two ways, first advocates sought techniques and practices that put GIS technology in the hands of community groups and grassroots organizations. This approach often left unresolved exactly how the user community was defined, content for practical definitions such as readily organized neighborhood groups, school children, or participants in a planning process. Second, linked PPGIS to alternative epistemologies oriented towards collecting local knowledge. However this approach could naively apply to a range of information a technology with static, discrete underlying data models. For example, Dennis (2006) sought to map youth preferences or favorite places, however placing this type of rich, qualitative data in a GIS lacked the richness of hand-drawn maps. From this perspective, if the map's power is in its wide communicative power, alternate mediums could support the goals of PPGIS practitioners, such as qualitative textual analysis, video, animation, or even text.

Also motivated by a desire to expand participation in the policy process, practitioners using visualization have developed methodologies that take advantage of technology to illustrate proposals under consideration. Sheppard (1989) described the ethical dimension of such work as visualization creators seek to communicate ideas without misleading the viewers of their products. Through an experimental design in Melbourne, Bishop (2005) developed a theory of the use of visualization for general *exploration* and specific *comparisons* of proposals. Like PPGIS, these developments have proceeded largely separate from specific decision-making contexts except for exceptional cases where resources for alternative methods are available.

The PPGIS and visualization movements have been impacted by two developments. First, the proliferation of technology has transformed early initiatives. The availability of location-aware devices such as low-cost GPS and smartphones have resulted in a wide range of specific applications. While not replicating all GIS functionality, these have made it easier for communities to consult existing formal datasets, contribute their own volunteered geographic data (VGI). The widespread availability of free or low-cost visualization software has dramatically expanded the creation of visual simulations. As noted by Ferriera (2008), the trend towards web mapping has accelerated this as mashups allow users to contribute data. Secondly, enhancing the ability to capture and communicate alternative geographic data or community values has limited meaning if it won't make it into the plan, or the plan is never implemented.

Scholars focusing on the development of processes which recognize and incorporate local knowledge and preferences argue capturing it within GIS is less important than an ongoing dialog (Hanna 2000; Innes 1998) with equal partners. Pickels (1995) has called for a much more critical evaluation of GIS technology in light of its origins as an instrument for powerful institutions and underlying assumptions about the form of knowledge, calling for a more fundamental re-evaluation than considered by most PPGIS projects.

Books

Craig, William J., Trevor M. Harris, and Daniel Weiner. 2002. *Community participation and geographic information systems*. London ; New York: Taylor & Francis.

Lange, Eckart, and Ian D. Bishop. 2005. *Visualization in landscape and environmental planning : technology and applications*. London ; New York: Taylor & Francis.

MacEachren, Alan M., and D. R. F. Taylor. 1994. *Visualization in modern cartography*. 1st ed. Oxford, U.K. ; New York: Pergammon.

Pickles, John. 1995. *Ground Truth: The Social Implications of Geographic Information Systems*. New York: Guilford Press.

Sheppard, S. R. J. 1989. *Visual simulation : a user's guide for architects, engineers, and planners*. New York: Van Nostrand Reinhold.

Articles

Dennis, S. 2006. Prospects for qualitative GIS at the intersection of youth development and participatory urban planning. *Environment and Planning* 38: 2039-2054.

Geertman, Stan. 2002. Participatory Planning and GIS: a PSS to Bridge the Gap. *Environment and Planning B* 29(1): 21-25.

Hanna, K.S. 2000. The paradox of participation and the hidden role of information. *Journal of the American Planning Association* 66(4):389-410.

Harvey, F., and N. Chrisman. 1998. Boundary Objects and the Social Construction of GIS Technology. *Environment and Planning A* 30(9): 1683-1694.

Hoyt, L., R. Khosla, and C. Canepa. 2005. Leaves, pebbles, and chalk: Building a public participation GIS in New Delhi, India. *Journal of Urban Technology* 12 (1):1-19.

Innes, Judith, E. 1998. Information in Communicative Planning. *Journal of the American Planning Association* 64: 52-63.

Kartez, Jack D., and Molly P. Casto. 2008. Information Into Action: Biodiversity Data Outreach and Municipal Land Conservation. *Journal of the American Planning Association* 74

(4):467 - 480.

Sieber, R. 2006. Public Participation Geographic Information Systems: A Literature Review and Framework. *Annals of the Association of American Geographers* 96(3): 491-507.

Shiffer, M.J. 1999. Planning Support Systems for Low-Income Communities. In *High Technology and Low-Income Communities: Prospects for the Positive Use of Advanced Information Technology*, Cambridge, MA: MIT Press.

Talen, E. 2000. Bottom-Up GIS: A New Tool for Individual and Group Expression in Participatory Planning. *Journal of the American Planning Association* 66: 279-294.

Yeh, Anthony G.O., and Chris Webster. 2004. Planning, Government, Information, and the Internet. *Environment and Planning B* 31(2): 163-165.

Preparation for Urban Information Systems

Coursework

MIT	11.523	Spring 2011	Fundamentals of Spatial Database Management	Ferreira	-
MIT	ESD.86	Spring 2011	Data and Inference for Socio-Technical Systems	Larson, Welsch	-
MIT	11.522	Fall 2010	Research Seminar in Urban Information Systems	Ferreira	A
MIT	STS.487	Fall 2010	Ethics and Law on the Electronic Frontier	Weitzner, Abelson, Fischer	A
MIT	11.423	Spring 2010	Information, Asset Building, and the Immigrant City	Hoyt	L
MIT	11.951	Fall 2009	Simulating Sustainable Futures	Flaxman	A
UMD	URSP660	Spring 2008	Function and Structure of Metropolitan Areas	Shen	A
UMD	URSP606	Fall 2007	Microeconomics of Planning and Policy	Carruthers	A
UMD	URSP612	Fall 2006	GIS for Urban Planning	Shen	A

Methods Courses

HFAS	SOC203a	Fall 2010	Advanced Quantitative Research Methods	Winship	A-
MIT	11.956	IAP 2010	Action Research: Methods for Working at Planning's Sweet Spot	Hoyt, Ferreira, Sengupta	P
MIT	11.800	Spring 2010	Doctoral Research Seminar	Levy, Polenske	A
MIT	17.878	Fall 2009	Qualitative Research Methods	Locke, Steinfeld	B+
MIT	11.233	Fall 2009	Research Design for Policy and Planning	Carmin	A-
UMD	URSP 601	Fall 2006	Quantitative Research Methods	Shen	A
UMD	URSP 600	Spring 2007	Research Design and Application	Chen	A

Professional Experience

Rappaport Public Policy Fellow	Summer 2010	Mayor's Office and MIS Department, City of Boston	C. Osgood, N. Jacob
Research Analyst	8/08-8/09	Metropolitan Area Planning Council	Holly St. Clair
Founder	7/06-8/08	Rethink College Park	-

SECOND FIELD: DEMOCRATIC LAND USE PLANNING

The practice of local land use planning, or exerting social control over land through regulation and indicative plans, lies at the heart of American urban planning practice. Although underlying market dynamics (described by economic theory in the First Field) allocate resources and determine market demand, this section begins from the observation that extensive land use planning activities and detailed regulations exist in most American urban areas. Those facing the most development pressures are often the most tightly regulated, resulting in calls from economists to ease regulations. For the purposes of the field, land use regulation and planning are intertwined enterprises, related to but not exclusively controlled by state institutions.

This section proposes analyzing these activities from three points of view. First, the practice of planning and establishing regulations is a future-oriented activity, drawing upon theories of rational planning and private sector scenario planning. Second, a variety of theories can shed light on the motivations of actors: democracy, social choice, communicative action, and institutional collective action. Third, normative theories of community form provide concrete ideals which can motivate actions and give specific urban form to abstract values and interests.

1. Plans as Future Scenarios

This section contains two approaches to planning as a future-oriented activity: (1) traditional approaches to public planning as coordinating private action to achieve a public good, and (2) the development of multiple scenarios as a decision-making tool, abstracted away from normative goals or a theory of government.

The first view is a contemporary version of the synoptic or rational planning model where governments created plans as a future scenario to guide public and private actions (Kent 1964). From this perspective, they manage externalities, provide public goods, and resolve prisoner's dilemmas. Sketched in Klosterman (1985), these arguments are developed by Knaap, et al (1998), expanded in Hopkins (2001) and tested empirically by Knaap (2001). In its most sophisticated modern version, Hopkins (2001) argues planning is an activity required whenever multiple economic actors experience interdependence, indivisibility, and irreversibility.

In addition, drawing on a literature from private sector planning, advocates for scenario planning propose developing internally-consistent alternative scenarios. Contemporary planning has drawn on theories of scenario planning developed by private corporations as a means to create a structured process for designing plans. However, to the extent a plan allocates resources and impacts rights whether through state or private action, its creation is a social and political process which this literature is silent about. The origins of scenario planning lie in management science and corporate planning activities. Schoemaker describes its use by an oil company (1995), and Huss for an equipment manufacturer (1988). Adapting scenario planning methods to the public sector requires developing a method for defining which stakeholders should participate and on what terms. Khakee, describes a scenario analysis project in Västerås, Sweden. (1991) Contrary to Schoemaker's suggestion, the planning team is drawn entirely from various government departments and does not include external participants. Schoemaker advocates carefully identifying individual variables (uncertainties and trends) and evaluating their interrelationships. Scenario creation in urban development and planning must de-compose the relationships among different factors since a detailed analysis can find unexpected relationships or challenge conventional wisdom.

Books

Hopkins, Lewis D., and Marisa Zapata. 2007. *Engaging the future : forecasts, scenarios, plans, and projects*. Cambridge, Mass.: Lincoln Institute of Land Policy.

Hopkins, Lewis D. 2001. *Urban development : the logic of making plans*. Washington, DC: Island Press.

Kent, T. J. 1964. *The Urban General Plan*. San Francisco: Chandler Pub. Co.

Schwartz, Peter. 1991. *The art of the long view*. 1st ed. New York: Doubleday.

Articles

Cole, S. 2001. Dare to dream: Bringing futures into planning. *Journal of the American Planning Association* 67 (4):372-383.

Huss, WR. 1988. A move toward scenario analysis. *International Journal of Forecasting* 4 (3):377-388.

Khakee, A. 1991. Scenario construction for urban planning. *Omega* 19 (5):459-469.

Klosterman, R. E. 1985. Arguments for and against Planning. *Town Planning Review* 56 (1):5-20.

Knaap, Gerrit J., Lewis D. Hopkins, and Kieran P. Donaghy. 1998. Do Plans Matter? A Game-Theoretic Model for Examining the Logic and Effects of Land Use Planning. *Journal of Planning Education and Research* 18 (1):25-34.

Neuman, M. 1998. Does planning need the plan? *Journal of the American Planning Association* 64 (2):208-220.

Quay, Ray. 2010. Anticipatory Governance: A Tool for Climate Change Adaptation. Journal of the American Planning Association 76 (4):496 - 511.

Ryan, Brent. Forthcoming, 2011. "Reading Through a Plan: A visual theory of plan interpretation" Chapter for "The Oxford Handbook of Urban Planning", Ed. R. Weber, R. Crane.

Schoemaker, PJH. 1991. When and how to use scenario planning: a heuristic approach with illustration. *Journal of forecasting* 10 (6):549-564.

Schoemaker, PJH. 1995. Scenario planning: a tool for strategic thinking. *Sloan Management Review* 36:25-25.

Van der Helm, R. 2007. Ten insolvable dilemmas of participation and why foresight has to deal with them. *foresight* 9 (3):3-17.

2. Theoretical Perspectives on Regional Land Use Planning

Three bodies of theories provide views into the process of democratic land use planning at three scales: individual behavior, collectives in dialog, and that of self-interested institutions. Theories of social choice and participatory democracy provide perspectives on individual behavior. These critically evaluate the motivations and causal mechanisms explaining civic voluntarism, and social choice provides a framework to study the function and limits of methods for aggregating interests. However, the world of static and known interests assumed by social choice theory provides a limited view to real-world processes where issues loosely related or disconnected from personal utility are evaluated, such as aesthetic decisions, or where positions and interests are discovered and defined through social processes.

Sager provides a roadmap whereby social choice defines limits of communicative action theory, but also proposes a relationship between these two worlds. Communicative action is contained in section two, which includes works by Habermas, and planning scholars such as Innes, Booher, Forester, and Healey who have applied this theory to analyze professional behavior and propose normative models for the planning process.

Lastly, metropolitan land use policy is not made either exclusively through direct democracy at the local level, or by stakeholder groups engaging in ideal Habermasian dialog. Although municipal zoning plays a key role, it is constrained by state and federal wetlands and affordable housing regulations, for example. Transportation policy is determined through a complex set of state actors, independent agencies, and Metropolitan Planning Organizations (MPO). Still other initiatives, launched as extra-governmental initiatives, have resulted in significant changes to public policy such as major expansions of urban transit or modification of state laws. A perspective from institutional collective action theory provides a useful framework to understand both self-interested behavior by metropolitan institutions as well as possibilities for alternative approaches to regional problems.

(1) Individuals: Social Choice and Participatory Democracy

Planning processes involve large numbers of people in an individual capacity. Often, as voters they are called on to elect candidates or address initiatives about the use of land. More common is the ubiquitous public meeting, held for a myriad of purposes, which can include voting, discussion, education and persuasion. Three bodies of theory address this scale of activity: social choice theory, normative democratic theory, and theories from political sociology explaining civic participation.

Social choice theory applies rational choice assumptions and rigorous mathematical models to the political realm, in the context of voting or other systems for aggregating individual preferences. Its main contribution has been a set of impossibility theorems. For example, that all systems of aggregating views have fundamental flaws (Arrow's Impossibility theorems), no decision procedure is strategy-proof (Gibbard-Satterthwaite theorem). Although the highly abstract models have limited application to real-world systems, they can be useful in the design and analysis of planning procedures which use discrete ranking or weighting (UIC City Design Center 2008), and also propose frameworks to consider behavior such as lying or manipulation

missing from more normative models. For these reasons Sager has sought to integrate social choice and communicative perspectives (1997, 1999, 2001, 2002).

Second, following from "classical" democratic theory of Aristotle and JS Mill, Mansbridge and Pateman have theorized about the desirability and types of direct democracies. Mansbridge argued there were two types: unitary and adversary. She maintains deliberation is possible even if there exists conflicts of interests (Mansbridge et al 2010). Pateman argued for the 'developmental thesis' of participation from Mill and other theorists. A widely cited model in planning, Arnstein (1969) proposed a latter of participation oriented towards delegating power which can be conceptualized as part of the classical theory of the desirability of participatory (and therefore local) democracy. Fung (2006) proposed a more nuanced typology of participatory practices, proposing they can vary on three dimensions: who participates, the communication and decision mode, and finally the connection with action and public policy. Like Arnstein, he is motivated by values of classical democracy, arguing participation can help address three democratic objectives: legitimacy, justice, effectiveness through various means.

Third, political scientists have studied political participation. The socioeconomic effects literature has linked measures of SES status, such as family background, educational attainment, and earnings to measures of participation, such as voting. More recent works have developed the theory further, describing the role of intermediate variables and processes such a interest, information, recruitment, efficacy, and partisan intensity that provide the desire, knowledge, and self-assurance for a wider range of political behavior (Verba, Schlozman, and Brady 1995). Other studies have examined the role of education in detail, arguing for three mediating variables: verbal proficiency, organizational membership, and social network centrality (Nie, Junn, and Stehlik-Barry 1996).

<u>Books</u>

Arrow, Kenneth Joseph. 1951. *Social choice and individual values*. New York: Wiley.

Nie, N.H., J. Junn, and K. Stehlik-Barry. 1996. *Education and democratic citizenship in America*: University of Chicago Press.

Sager, Tore. 2002. *Democratic planning and social choice dilemmas : prelude to institutional planning theory*. Burlington, VT: Ashgate.

Verba, Sidney, Kay Lehman Schlozman, and Henry E. Brady. 1995. *Voice and equality : civic voluntarism in American politics*. Cambridge, Mass.: Harvard University Press.

UIC City Design Center, UIC Vorhees Center for Neighborhood and Community Improvement, and Edgewater Development Corporation. 2008. *Edgewater Red Line Corridors Revitalization Study*. Chicago, Il.

<u>Articles</u>

Arnstein, Sherry R. 1969. A ladder of citizen participation. *Journal of the American Planning Association* 35 (4):216-224.

Fiorina, MP. 1999. Extreme voices: a dark side of civic engagement. In *Civic engagement in American democracy*:395-425.

Fung, A. 2006. Varieties of participation in complex governance. *Public Administration Review* 66 (s1):66-75.

Maier, K. 2001. Citizen Participation in Planning: Climbing a Ladder? *European Planning Studies* 9:707-719.

Mansbridge, Jane, James Bohman, Simone Chambers, David Estlund, Andreas Follesdal, Archon Fung, Cristina Lafont, Bernard Manin, and Jose Luis Marti. 2010. The Place of Self-Interest and the Role of Power in Deliberative Democracy. *Journal of Political Philosophy* 18 (1):64-100.

Sager, T. 1999. Manipulation in planning: The social choice perspective. *Journal of Planning Education and Research* 19 (2):123.

Sager, T. 1997. Planning and the liberal paradox: A democratic dilemma in social choice. *Journal of Planning Literature* 12 (1):16.

Sager, T. 2001. Positive theory of planning: the social choice approach. *Environment and Planning A* 33 (4):629-648.

(2) Collectives: Communicative Rationality

The theory of communicative rationality concerns the construction of consensus and shared meaning among groups of people by recognizing an alternative form of rationality from instrumental rationality. Habermas argues this *intersubjective* rationality can arise between individuals or organizations in certain situations. In his theory, this form of rationality is distinct from instrumental rationality, and can counter powerful interests. In the communicative rationality tradition, the theory of Habermas is adapted to a policy context. The adherents vary according to their backgrounds, for example Healey (1997) integrates it with Anthony Giddens' structuration theory to describe the state-centered UK planning model. Innes has evolved from an exploration of social and economic indicators (1975) to deliberative processes (2010). Forester is a student of the micro-politics of planning at the finegrain of daily activity, applying communicative action as a descriptive theory for ethnographic research. Susskind's consensus building approach can be thought of as a pragmatic intermediate level of theory linking the more abstract theory with practice.

<u>Books</u>

Habermas, Jürgen. 1984. *The theory of communicative action*. Boston: Beacon Press.

Healey, Patsy. 1997. *Collaborative planning : shaping places in fragmented societies*. Vancouver: UBC Press.

Heath, Joseph. 2001. *Communicative action and rational choice*. Cambridge, Mass.: MIT Press.

Innes, Judith E., and David E. Booher. 2010. *Planning with Complexity: An Introduction to Collaborative Rationality for Public Policy*. London and New York: Routledge.

Forester, John. 1989. *Planning in the face of power*. Berkeley: University of California Press.

Articles

Innes, JE. 1995. Planning theory's emerging paradigm: communicative action and interactive practice. *Journal of Planning Education and Research* 14 (3):183.

Innes, Judith Eleanor. 1975. *Social indicators and public policy : interactive processes of design and application*. New York: Elsevier Scientific Pub. Co.

Hoch, Charles J. 2007. Pragmatic Communicative Action Theory. *Journal of Planning Education and Research* 26 (3):272-283.

Huxley, M. 2000. The limits to communicative planning. *Journal of Planning Education and Research* 19 (4):369.

Stein, Stanley M., and Thomas L. Harper. 2003. Power, Trust, and Planning. *Journal of Planning Education and Research* 23 (2):125-139.

(3) Institutions: A Collective Action Approach

Regional development patterns are powerfully shaped not only by democratic processes but self-interested institutions. Municipalities seek to maximize revenues and minimize negative externalities within their borders. In response to regional transportation needs, urban disinvestment, and service delivery, metropolitan regions contain dozens of special-purpose districts (Frug, et al 2010). The powers possessed by municipalities are continually modified by state legislatures, who sometimes opt for state-mandated growth policies. For example, in Massachusetts local zoning can be overridden for certain affordable housing projects, restricted by environmental regulations, and shaped by incentives for certain types of zoning (40R). Richard Feiock has proposed adopting a collective action framework to better understand these activities (2010, 2004). In it, it proposes a variety of tools of regional governance built on various forms of decision making and the level of autonomy afforded the institutional participants. This theory provides a framework to analyze the wide range of institutional actors concerned with metropolitan development, but also recognize what tools can be used to achieve policy goals.

Books

Feiock, Richard C., and John T. Scholz, eds. 2010. *Self-organizing federalism : collaborative mechanisms to mitigate institutional collective action*. New York: Cambridge University Press.

Feiock, Richard C, ed. 2004. *Metropolitan governance : conflict, competition, and cooperation*. Washington, D.C.: Georgetown University Press.

Frug, Gerald E., Richard T. Ford, and David J. Barron. 2010. *Local government law : cases and materials*. 5th ed, *American casebook series*. St. Paul, MN: West.

Ostrom, Elinor. 1990. *Governing the commons : the evolution of institutions for collective action*. New York: Cambridge University Press.

Articles

Feiock, R.C. 2009. Metropolitan governance and institutional collective action. *Urban Affairs Review* 44 (3):356.

Weir, M., J. Rongerude, and C.K. Ansell. 2009. Collaboration Is Not Enough. *Urban Affairs Review* 44 (4):455.

Wheeler, Stephen M. 2002. The New Regionalism: Key Characteristics of an Emerging Movement. *Journal of the American Planning Association* 68 (3):267 - 278.

3. Normative and Regional Contexts

Planning processes play out in the context of both general and specific normative models for urban and regional form. The general models include new urbanism, smart growth, landscape urbanism and other design ideals abstracted away from specific spatial contexts as models which can be drawn from to propose specific action. Specific models include the historical and regional context: institutional arrangements, existing plans, and values embodied in the built environment.

(1) Normative Theories of Urban Form: Social Perspectives

Land use planning is the arena where ideals of the good city and the good neighborhood are debated, codified in regulations and plans, and ultimately shape urban form. Therefore the actions of individuals, developers, and institutions cannot be understood in isolation from a theory of good urban form. In the context of individual or institutional interests, normative theories constitute a stock of design ideals to call upon as models for how abstract values can be implemented in concrete designs and plans. Although encompassing theories at a range of scales, my particular interest is in urban design theories at the neighborhood and community scale.

Books

Calthorpe, Peter, and William B. Fulton. 2001. *The regional city : planning for the end of sprawl*. Washington, DC: Island Press.

Duany, Andres, Elizabeth Plater-Zyberk, and Jeff Speck. 2000. *Suburban nation : the rise of*

sprawl and the decline of the American Dream. 1st ed. New York: North Point Press.

Hall, Peter Geoffrey. 1988. *Cities of tomorrow : an intellectual history of urban planning and design in the twentieth century*. Oxford, UK ; New York, NY, USA: Blackwell.

Jacobs, Jane. 1961. *The death and life of great American cities*. New York: Random House.

Lynch, Kevin. 1984. *Good city form*. Cambridge, Mass.: MIT Press.

Zukin, Sharon. *Naked city : the death and life of authentic urban places*. New York: Oxford University Press.

Articles

Banerjee, Tridib, and William C. Baer. 1984. *Beyond the neighborhood unit : residential environments and public policy*. New York: Plenum Press.

Burchell, RW, D Listokin, and CC Galley. 2000. Smart growth: More than a ghost of urban policy past, less than a bold new horizon. *Housing Policy Debate* 11 (4):821-879.

Ellis, C. 2002. The new urbanism: Critiques and rebuttals. *Journal of Urban Design* 7 (3):261-291.

Ryan, Brent D. 2004. AlphaWorld: The Urban Design of a Digital City. *Journal of Urban Design* 9 (3):287-309.

Silver, Christopher. 1985. Neighborhood Planning in Historical Perspective. *Journal of the American Planning Association* 51 (2):161 - 174.

Sorkin, Michael. 2009. The End(s) of Urban Design. In *Urban Design*, edited by A. Krieger and W. S. Saunders. Minneapolis: University of Minnesota Press.

(2) Normative Theories of Urban Form: Environmental Perspectives

Social perspectives on urban form begin from an assumption of human intervention in the natural landscape. The environmental perspective embraces the concept of wilderness, and adopts the perspective guided by a vision of natural systems untouched by human contact, and then proposing design approaches for human settlement which seek this goal. McHarg (1992, 1998) developed early analysis techniques to shape urban form in response to natural systems on the earth's surface. Spirn (1984) identified natural processes at work in the city, and proposed design approaches which synthesized human needs and natural systems.

Recent developments have sought novel combinations from socially and environmentally motivated design approaches. For example, greenways and large urban parks are appreciated as both wildlife habitat and as amenities from Smart Growth. However, the diverse movement of landscape urbanism (2006) reveals adherents with conflicting positions on these earlier design approaches, animating ongoing debate.

Books

Arendt, Randall, Holly Harper. 1996. *Conservation design for subdivisions : a practical guide to creating open space networks*. Washington, D.C.: Island Press.

McHarg, Ian L. 1992. *Design with nature*. New York: J. Wiley.

McHarg, Ian L., and Frederick R. Steiner. 1998. *To heal the earth : the selected writings of Ian L. McHarg*. Washington, D.C.: Island Press.

Spirn, Anne Whiston. 1984. *The granite garden : urban nature and human design*. New York: Basic Books.

Waldheim, Charles. 2006. *The landscape urbanism reader*. New York: Princeton Architectural Press.

Articles

Leopold, Aldo. 1949. The Land Ethic. In *A Sand County Almanac: And Sketches Here and There*: Oxford University Press, Inc.

(3) Land Use in Metropolitan Boston

My planned dissertation research will take place in metropolitan Boston. This section contains the current regional plan, a master's thesis examining its creation, a description of the region's unique land use regulation regime, and a thesis examining a land use planning process.

Books and Reports

Hodges, Christopher J. 2004. *Fostering land use dialog: community preservation as a growth management strategy in Massachusetts*, Thesis, MIT Department of Urban Studies and Planning, Massachusetts Institute of Technology, Cambridge, MA.

Metropolitan Area Planning Council. 2008. MetroFuture Regional Plan: Goals, Objectives, and Draft Implementation Steps.

———. 2008. MetroFuture Implementation Strategies. Boston, MA.

Paul, Evan Thomas. 2010. Projections, politics, and practice in regional planning: a case study of MetroFuture, Department of Urban Studies and Planning, Massachusetts Institute of Technology, Cambridge, MA.

Barron, David J., Rappaport Institute for Greater Boston., Gerald E. Frug, and Rick T. Su. 2004. *Dispelling the myth of home rule : local power in greater Boston*. Cambridge, Mass.: Rappaport Institute for Greater Boston.

Preparation for Democratic Land Use Planning

Coursework

MIT	11.301J	Spring 2011	Urban Design Policy & Action	Ryan	-
MIT	11.949	Spring 2010	Engaging Community	Spirn, McDowell	A
HKS	D216	Spring 2010	Democratic Theory	Mansbridge	A-
HLS	4350	Spring 2010	Local Government Law	Frug	P
UMD	HISP640	Spring 2007	Historic Preservation Law	Mayes	A
UMD	URSP605	Fall 2006	Planning Process	Chen	A-
UMD	URSP603	Spring 2007	Land Use Planning	Craze	B

Professional Experience

Teaching Assistant	Fall 2010	Gateway: Planning Action	Sanyal
Research Associate	Summer 2007 + 2008	Urban Land Institute	Schmitz, Hart

UMD: University of Maryland, HKS: Harvard Kennedy School of Government, HLS: Harvard Law School, HFAS: Harvard Faculty of Arts and Sciences, UMD: University of Maryland, College Park.

PROPOSED EXAM

I. Format

The general exam will have a written and oral component. The written portion will be five days, from Friday, 5/20/11 to Tuesday, 5/24/11. The questions will be emailed by 10:00 a.m. the first morning and the answers will be emailed to the committee at 5:00 p.m. on the due date.

The written exam will consist of four questions. The questions will be structured as follows: three questions will be proposed and two answered from each field. Each question has an 8 page limit (excluding references). Responses should be double spaced, with one-inch margins and 12 point font.

The oral examination will follow in a session on Tuesday, May 31st. The questions and discussion for this portion will be based on responses to the written examination.

II. Sample Questions

First Field

1. Urban planning often requires coordinating among multiple independent agencies. Describe the use of web services and standards to enable communication and coordination of geospatial data. What technologies and standards can enable sharing of various types of information, and what are the policies and institutional factors are emerging? What tradeoffs are involved in developing appropriate strategies for typical municipal and metropolitan regions.

2. Drawing on models from the private sector, several writers have proposed the creation of "decision support systems" for urban planning. Critically evaluate this literature, and contemporary models which are used in a decision support capacity. What are the organizational and theoretical assumptions of these proposals? Briefly describe several public sector contexts where such systems are used, and these contexts' institutional and technical factors.

3. In the 1990s, scholars proposed alternate approaches to using GIS technology such as Bottom up GIS (BUGIS) and Public Participation GIS (PPGIS). Explain the critique of conventional GIS use advanced by the advocates of these approaches. Analyze the relevance of these models in light of mapping mashups, volunteered geographic information, and other internet technologies which are expanding access and use of GIS technology.

Second Field

1. Creating urban plans remains a defining activity for the field of urban planning. Describe alternative views about how we should understand these documents. In particular, analyze how they are viewed from three theoretical perspectives: economics, scenario planning, and as expressions of ideas and values.

2. In the past two decades, two movements aspiring to guiding metropolitan urban form have dominated professional practice: Smart Growth and New Urbanism. How did the history of American urban development gave rise to these normative and political movements? Analyze their normative aspirations in light of environmental and aesthetic critiques by ecological or landscape urbanists, who call for new ideals of urban form.

3. Theorists have drawn upon Habermas' theory of Communicative Action to study urban planning. How has this theory been used to analyze the planning process, construct practical models to achieve consensus, and construct data indicators? What do alternative frameworks, such as economics and social choice theory, say about the usefulness and role of communicative action in planning?