



UP 529: Scenario Planning

Winter 2016

“Memory of the past, observation of the present, foresight of the future are indispensable. But they are indispensable to a present liberation, an enriching growth of action.”
 – John Dewey, *Human Nature and Conduct* (1922 ed., p. 265)

Course Staff and Schedule

Instructor: Prof. Robert Goodspeed (rgoodspe at umich.edu)
 Office: 2223C Art & Architecture Building
 Office Hours: Friday 1:00-3:00 PM (sign up by Canvas link)
 Credits: 3
 Prerequisites: UP 506 or NRE 531, or similar GIS background with permission of the instructor

Class Schedule: Tuesday and Thursday, 2:30 – 4:00 PM, Room 2204 Art & Architecture Building

Summary and Learning Objectives

Growing uncertainty about the future has made considering the long-term implications of public decisions more difficult than ever. All planning specialties must now consider uncertainties associated with forces like climate change, new technologies, economic restructuring, and changing social preferences. Given the failure of conventional methods of prediction, professionals are increasingly turning to scenario planning to consider future uncertainty. Instead of proposing only a most likely or most desired future scenario, practitioners using scenario planning construct multiple possible futures. Doing so requires combining art with science: applying not only creativity but also rigorous analysis. The goal of scenario planning is to make better plans and decisions by challenging stakeholder assumptions and encouraging learning.

The goal of the course is to introduce students to this exciting professional technique, as well as provide hands-on experience using GIS-based planning support systems (PSS) used to implement scenario planning. This course contains four modules: (1) an overview of scenario planning theory and concepts, (2) an exploration of the applications of the method in various sub-fields of urban planning, (3) an examination of some of the modeling tools used for scenario planning, and (4) an opportunity to use leading PSS tools to construct scenarios and explore their economic, land use, transportation, and environmental dimensions. The course will involve readings, discussion, and a series of individual and group assignments which culminate in detailed student-generated scenarios for a site in Ann Arbor where large-scale development has been proposed.

Student Audience and Prerequisites

The course is designed for students from all concentrations in the Masters of Urban Planning program, as well as students interested in this planning method from across the University. However, UP 506 (Intro. to GIS) or an equivalent course is a required prerequisite. Students without this prerequisite but with adequate background in GIS can enroll with the permission of the instructor.

Materials

The course utilizes readings from one book, the remainder of the readings will be provided on Canvas.

- Hopkins, Lewis D., and Marisa Zapata. 2007. *Engaging the Future: Forecasts, Scenarios, Plans, and Projects*. Cambridge, Mass.: Lincoln Institute of Land Policy. (Referred to below as “ETF”)

Resources

Additional references are provided below for many of the class sessions. This section provides additional resources to learn about research and practice of scenario planning.

Journals

Environment and Planning B (<http://www.envplan.com/B.html>)

Computers, Environment, and Urban Systems (<http://www.journals.elsevier.com/computers-environment-and-urban-systems/>)

Futures (<http://www.journals.elsevier.com/futures/>)

Technological Forecasting and Social Change (<http://www.journals.elsevier.com/technological-forecasting-and-social-change/>)

Professional Organizations

Open Planning Tools Group (listserv and annual symposium) (<http://scenarioplanningtools.org>)

Computers in Urban Planning and Urban Management (CUPUM)

Biannual international conference of scholars and practitioners involved in urban modeling and analysis.

2015 – Boston, Mass. (<http://cupum2015.mit.edu>)

2013 – Utrecht, Netherlands (<http://cupum2013.geo.uu.nl>)

U.S. Federal Highway Administration Scenario Planning Group

http://www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/

Assignments

- **Class Attendance and Participation** (5%)
- **Discussion Posts:** *Before* any Tuesday class, students should post 250-word response, reaction, or question emerging from the materials to the Canvas forum. These are due by 5PM on the day before. Students must complete comments for all but one week for each module, a total of 10. Posts will be graded according to a separate rubric. (15%)
- **Assignments:** See below: Futures Method Report, Scenario Definition Essay, Tool Report, Final Presentation. (45%)
- **Laboratory Assignments:** Described below. (9) (35%)

Course Policies

In addition to those specified here, policies which may apply to students in this class include those of the Urban and Regional Planning Program, Taubman College, students' home academic units, and the University.

Academic Integrity

Taubman College Policy on Plagiarism: *"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."*

Accommodations for Students with Disabilities

It is Taubman College policy to "meet the educational needs of all persons, including those with physical or perceptual limitations, who are interested in the study of architecture, urban planning and/or urban design." 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. As soon as you make me aware of your needs, 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 Individualized Services and Accommodations (VISA) form. Any information you provide is private and confidential and will be treated as such.

Course Overview and Assignments

Scenario planning has emerged as an influential professional technique in urban planning and related fields since it integrates diverse forms of knowledge, systems analysis, future-oriented thinking, and a consideration of uncertainty. Scenario planning most accurately refers to a diverse area of planning practice which involves a variety of assumptions, tools, and methods. As a consequence, the course has two primary learning objectives for graduate students in planning: to cultivate *reflective practitioners*, and to provide specific technical skills to empower students to implement these ideas themselves or by working with a team.

Reflective Practitioners: Theory, Method, and Cases

The primary goal of this class is to cultivate *reflective practitioners* (Schön 1983), who are prepared to implement forms planning appropriate to the questions and problems they will face in their lives and as professionals. To do this, the course provides an introduction to theories, debates, and modeling tools used in scenario planning. Students then consider how these ideas have been translated into contemporary practice through the study of several cases. In many advanced scenario planning projects, urban planners involved work with consultants and multifunctional teams to integrate scenario creation, stakeholder engagement, and modeling and analysis. Therefore, the course examines several advanced modeling tools in detail, in order to empower future planners to be educated consumers of tools used in practice. Through scholarly articles and technical documentation students examine a range of tools for sketch planning and urban modeling, examining their logic, assumptions, weaknesses and strengths.

Technical Skills: Ann Arbor Project

The second aim of this course is to provide specific technical skills to implement one approach to scenario planning feasible to implement within the confines of the course. As summarized below, working both individually and in groups, the class will collectively create two scenarios for the selected project site in Ann Arbor. The scenario types and content will be determined by the class, and might include *predictive, explorative, or normative* scenarios (Börjeson et al. 2006, W4).

Assignments:

The schedule and diagram below provide a description of how these assignments are related, and are linked to the course readings and cases.

Module 1

- **A1 Futures Method Report:** Working in assigned groups, the students are asked to review materials for one of several alternative planning methods: visioning, strategic planning, general or comprehensive planning, forecasting, and utopian imagination. This assignment reinforces the unique nature of scenario planning, but also begin to explore how ideas might be fruitfully combined in practice.
- **L1 Stakeholder Identification:** The class considers the multiple stakeholders for the physical development of the project site, identifying the key issues for each stakeholder.
- **L2 Project Context Research:** Each student is asked to prepare summary slides exploring issues identified by the stakeholder identification assignment.
- **L3 Scenario Narrative Development:** Drawing on their emerging understanding of the site, students work as a group in class to construct four scenarios by selecting two major uncertainties and placing them on two axes.
- **A2 Scenario Definition Essay:** Students will write a short essay synthesizing the readings on scenario planning.

Module 2

- **L4 Building Prototype Exercise:** Working individually, students construct building prototypes which might be used for either a *forecast* or *transforming* scenario.
- **L5 Development Type Exercise:** Next, using the buildings created in the previous assignment, also working individually, students will create development types which could be used for either scenario.
- **L6 Suitability Analysis:** Next, students will create a suitability map for their development type for the project site using a simplified attractiveness and constraint raster analysis.

Module 3

- **A3 Tool Report:** Working in small groups, students present on various scenario planning tools.

- **L7 Scenario Construction:** Finally, the big moment has arrived! In a participatory workshop setting, working in groups, the students will sketch and refine the scenarios, drawing on the suitability analysis and development type indicators.
- **L8 Scenario Analysis:** Working individually, students implement a site-level transportation analysis.

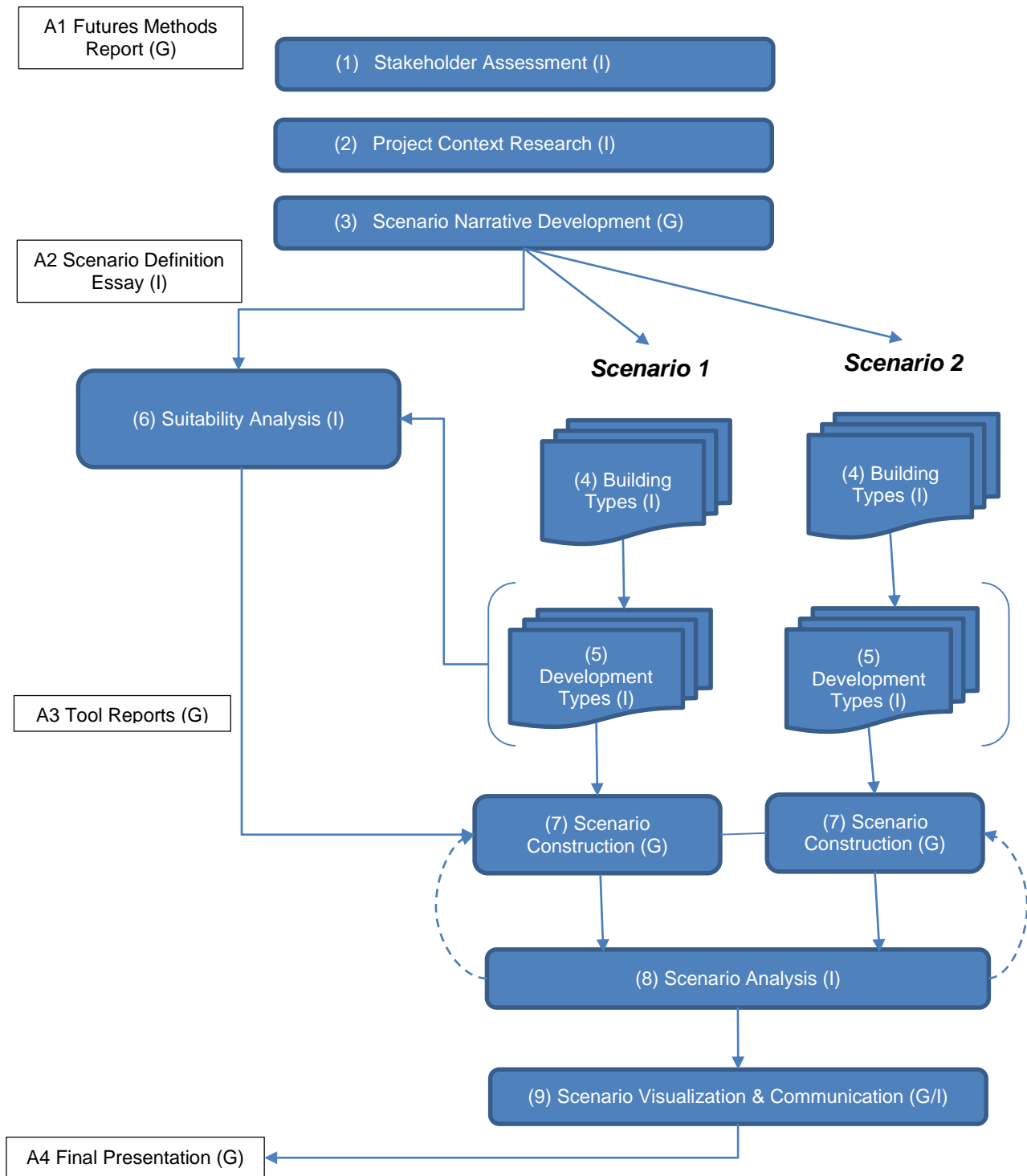
Module 4

- **L9 Scenario Visualization & Communication:** Students will work in groups to produce representations of their scenarios, which will be used for the final presentation. This includes charts, tables, maps, and/or 3D representations from CityEngine.
- **A3 Final Presentation:** Using the outcomes from the previous labs, the class as a group prepares and deliver a summary presentation open to Taubman College and invited stakeholders.

Schedule Overview

Week	Modules	Topics	Assignments	Cases or Tools
1	1: Introduction to SP Theory and Practice	Introduction		
2		SP and Its Alternatives	A1: Futures Method Report	
3		SP Origins and Concepts	L1: Stakeholder Identification	
4		Scenario Types & Construction	L2: Project Context Research	
5		Participation	L3: Scenario Narrative Development A2: Scenario Definition Essay	
6	2: Practice Areas	Urban Land Use and Transportation	L4: Building Types	San Francisco
7		Climate Change	L5: Development Types	Central New Mexico
8		Environmental Planning	L6: Suitability Analysis	Florida
10	3: Modeling Urban Scenarios	Modeling Introduction & Sketch Planning	A3: Tool Report	CommunityViz, Index, Envision Tomorrow+, What If?, UrbanSim
11		Advanced Modeling 1: Econometric Land Use & Transportation	L7: Scenario Construction	UrbanSim and Urban Strategy
12		Advanced Modeling 2: Spatial & Systems Dynamics	L8: Scenario Analysis	LEAM, Systems Dynamics
13	4. Advancing Practice & Final Presentations	Scenario Visualization & Communication	L9: Scenario Visualization & Communication	CityEngine
14		SP as a Sociotechnical Infrastructure	Draft Presentation	
15		Conceptualizing & Measuring Learning	A4: Final Presentation	
16		Close & Party		

Overview of Laboratory Assignments



Key
 (G) – Group Assignment
 (I) – Individual Assignment

Course Connections with MUP Concentrations

The techniques of scenario planning can be used at various scales and across multiple sub-fields of planning. Although the labs most directly connect to the professional practice of land use planning, the type of planning they demonstrate is most accurately described as spatial planning (Albrechts 2004, W2), since like the professional practice it mimics, the project integrates into a discussion of land use topics such as real estate financial analysis, housing affordability, environmental concerns, travel behavior, street design, and other topics. The table below illustrates readings/lectures, labs, and cases which particularly link with one of the five concentrations in UM's Master of Urban Planning program. Although the labs and cases are U.S.-focused, there are readings discussing tools and practices from Europe, South Africa, and Australia, and many of the modeling tools discussed are used worldwide.

	Land Use and Environment Pl.	Housing, Comm. & Econ. Dev.	Global and Comparative	Physical Pl. & Design	Transportation
Reading/ Lectures	W7 Land Use and Trans, W6 Environmental Pl.	W5 Participation & Equity	W2 European SP, W7 Environmental Pl., W9 European Articles, W12 Australia	W12 Visualization	W6 Land Use and Trans
Labs	L5 Development Types, L6 Suitability Analysis, L7 Scenario Const.	L1 Stakeholder Assessment, L4 Building Types	-	L2, Site Analysis, L5 Devt Types, L9 Visualization	L8 Scenario Analysis
Cases	Great Lakes Shorelands	Great Lakes Shorelands & Envision Tomorrow	-	Envision Tomorrow	Central New Mexico

W# = Week, L# = Lab

Schedule

Module 1: Scenario Planning Theory and Concepts

Week 1 – Introduction and Course Overview

Course overview and student introductions. Discussion on Dewey's argument for future-oriented action and the need for techniques to introduce intelligence, and cities as complex systems.

Thurs., Jan. 7: Introduction

1. Dewey, John. 1922. "Section IX: The Present and the Future" in *Human Nature and Conduct: An Introduction to Social Psychology*. New York: Holt. Available online via Project Gutenberg at: <http://www.gutenberg.org/files/41386/41386-h/41386-h.htm#Pg265>
2. Chapter 22, "The kind of a problem a city is," in Jacobs, Jane. 1961. *The Death and Life of Great American Cities*. New York: Random House, Inc.
3. Meadows, Donella. 1999. "Leverage Points: Places to Intervene in a System." Donella Meadows Institute.

Week 2 – Thinking About the Future: Scenario Planning and Its Alternatives

Scenario planning is only one way planners have thought about the future. First we discuss some of the basic concepts, considering ideas such as visioning, forecasting, scenarios, plans, and project implementation, and discuss how they relate to one another. On Thursdays, students present in small groups about the method they have chosen.

Tues., Jan. 12: Lecture and Discussion, "Thinking About the Future in Planning"

1. Hopkins and Zapata, ETF Ch. 1
2. Isserman, Andrew M. 1985. "Dare To Plan: An Essay On The Role of The Future in Planning Practice And Education." *Town Planning Review* 56 (4):483.
3. Cole, S. 2001. "Dare To Dream: Bringing Futures Into Planning." *Journal of the American Planning Association* 67 (4):372-383.
4. Myers, D., and A. Kitsuse. 2000. "Constructing the Future in Planning: A Survey of Theories and Tools." *Journal of Planning Education and Research* 19 (3):221.
5. Wiechmann, Thorsten. 2008. "Errors Expected—Aligning Urban Strategy with Demographic Uncertainty in Shrinking Cities." *International Planning Studies* 13 (4):431-446.

Additional Readings

- Dalton, Linda C. 2001. "Thinking about Tomorrow: Bringing the Future to the Forefront of Planning." *Journal of the American Planning Association* 67 (4):397-401.

Thurs., Jan. 14: A1 Futures Method Reports (due in class)

Visioning

- Shipley, R. 2002. "Visioning in planning: is the practice based on sound theory?" *Environment and Planning A* 34 (1):7-22.
- Shipley, R., and R. Newkirk. 1999. "Vision and Visioning in Planning: What do These Terms Really Mean?" *Environment and Planning B: Planning and Design* 26 (4):573-591.
- Shipley, Robert, and Ross Newkirk. 1998. "Visioning: Did Anybody See Where It Came from?" *Journal of Planning Literature* 12 (4):407-416.
- Helling, Amy. 1998. "Collaborative Visioning: Proceed With Caution!: Results From Evaluating Atlanta's Vision 2020 Project." *Journal of the American Planning Association* 64 (3):335-349.

Strategic Planning

- Albrechts, L. 2004. "Strategic (spatial) planning reexamined." *Environment and Planning B* 31:743-758.
- Bryson, John M. 2004. *Strategic Planning for Public and Nonprofit Organizations: A Guide to Strengthening and Sustaining Organizational Achievement*. 3rd ed. San Francisco: Jossey-Bass.
- Kaufman, Jerome L, and Harvey M Jacobs. 1987. "A Public Planning Perspective on Strategic Planning." *Journal of the American Planning Association* 53 (1):23-33.

General and Comprehensive Planning

- Kent, T. J. 1964. *The urban general plan*. San Francisco: Chandler Pub. Co.

- Kelly, Eric D., and Barbara Becker. 2000. *Community Planning: An Introduction to the Comprehensive Plan*. Washington, D.C.: Island Press.

Forecasting

- Isserman, ETF Ch. 9
- Wachs, M. 2001. "Forecasting versus Envisioning: A New Window on the Future." *Journal of the American Planning Association* 67 (4):367-372.
- Næss, Petter, and Arvid Strand. 2012. "What Kinds of Traffic Forecasts are Possible?" *Journal of Critical Realism* 11 (3):277-295.
- Tetlock, Philip E., and Dan Gardner. 2015. *Superforecasting: The Art And Science Of Prediction*. Crown.

Utopian Imagination

- Hoch, Charles. 2014. "Utopia, scenario and plan: A pragmatic integration." *Planning Theory*. Published online before print January 20, 2014. doi: 10.1177/1473095213518641
- Thun, Geoffrey, Kathy Velikov, Colin Ripley and Dan McTavish. 2015. *infra eco logi urbanism -- A Project for the Great Lakes Megaregion*. Park Books.
- Anonymous author. Freshwater Railway: Southeast Michigan's Regional Rail System. Available online: <http://www.fwrail.org/>
- Introduction and Section 2, "Frank Lloyd Wright," in Fishman, Robert. 1977. *Urban Utopias in the Twentieth Century: Ebenezer Howard, Frank Lloyd Wright, and Le Corbusier*. New York: Basic Books.

Week 3 – Scenario Planning Origins and Concepts

This week we explore the origins and development of scenario planning ideas. Originally conceived of as a method for "thinking the unthinkable" in the Cold War, the technique was adopted in business in the 1980s, especially by firms in industries susceptible to geopolitical uncertainty (e.g., oil). We then begin to explore how the ideas have been applied to planning.

Tues., Jan. 19: Lecture and Discussion

1. Kahn, Herman. 1962. Chapter 5, "Some Strange Aids to Thought." In *Thinking about the Unthinkable*. New York: Horizon Press.
2. Schoemaker, P.J.H. 1995. "Scenario Planning: A Tool for Strategic Thinking." *Sloan Management Review* 36:25-25.
3. Huss, W.R. 1988. "A Move Toward Scenario Analysis." *International Journal of Forecasting* 4 (3):377-388.
4. Wack, Pierre. 1985. "Scenarios: Shooting the Rapids: How Medium-Term Analysis Illuminated the Power of Scenarios for Shell Management." *Harvard Business Review* 63 (6):139-150.

Thurs., Jan. 21: Lecture and Discussion

1. Smith, ETF Ch. 5
2. Khakee, A. 1991. "Scenario Construction for Urban Planning." *Omega* 19 (5):459-469.
3. Chakraborty, Arnab, and Andrew McMillan. 2015. "Scenario Planning for Urban Planners: Toward a Practitioner's Guide." *Journal of the American Planning Association* 61 (1): 18-29.

Lab 1: Stakeholder Identification (Due Friday, Jan. 22 at noon)

Additional References:

Management Focus

- Chermack, Thomas J. 2011. *Scenario Planning in Organizations: How to Create, Use, and Assess Scenarios*. Berrett-Koehler Publishers.
- Ogilvy, James A. 2002. *Creating Better Futures: Scenario Planning As a Tool for A Better Tomorrow*. New York, N.Y.: Oxford University Press.
- Ralston, Bill, and Ian Wilson. 2006. *The Scenario-Planning Handbook: A Practitioner's Guide to Developing and Using Scenarios to Direct Strategy in Today's Uncertain Times*. Australia; Mason, Ohio: Thomson/South-Western.
- Schwartz, Peter. 1991. *The Art of the Long View*. New York, Doubleday Currency.
- Van der Heijden, Kees. 1996. *Scenarios: The Art of Strategic Conversation*. Chichester, England New York: John Wiley & Sons.
- Varum, Celeste Amorim, and Carla Melo. 2010. "Directions in scenario planning literature – A review of the past decades." *Futures* 42 (4):355-369.

National-scale Focus

- Ringland, Gill. 2002. *Scenarios in Public Policy*. Chichester;New York: Wiley.
- Kahane, Adam. 2012. *Transformative Scenario Planning: Working Together To Change the Future*. 1st ed. San Francisco: Berrett-Koehler Publishers.

Urban Planning Focus

- Salewski, Christian. 2012. *Dutch New Worlds: Scenarios in Physical Planning and Design in the Netherlands, 1970-2000*. Rotterdam: 010 Publishers.

Week 4 – Scenario Types & Construction

This week we examine scenario types and development methods in detail, and then consider how they have been implemented in urban planning. Students then construct narrative scenarios for the project site.

Tues., Jan. 26:

1. Van Notten, P. et al. 2003. "An Updated Scenario Typology." *Futures* 35:5, pp. 423-43.
2. Börjeson, L., et al. 2006. "Scenario Types and Techniques: Towards a User's Guide." *Futures* 38, pp. 723-739.
3. Avin, ETF Ch. 6.
4. Bishop, P., A. Hines, and T. Collins. 2007. "The Current State of Scenario Development: An Overview of Techniques." *Foresight* 9 (1):5-25.
5. Cummings, ETF Ch. 12.
6. Mahmoud et al. 2009. "A Formal Framework for Scenario Development in Support of Environmental Decision-Making." *Environmental Modelling and Software* 24, pp. 798-808.

Additional Reading:

- Roberts, Eric J. 2014. *Exploratory Scenario Planning: Lessons Learned in the Field*. Lincoln Institute of Land Policy Working Paper. Available online at http://www.lincolninst.edu/pubs/2445_Exploratory-Scenario-Planning
- Avin, Uri P., and Jane L. Dembner. 2001. Getting Scenario-Building Right. *Planning* 67 (11):22.
- Burt, George. 2007. "Why are we surprised at surprises? Integrating disruption theory and system analysis with the scenario methodology to help identify disruptions and discontinuities." *Technological Forecasting and Social Change* 74 (6):731-749.

Thurs., Jan. 28: Project Context Presentations and Discussion

- L2 Project Context Research due in class

Sat., Jan 30 (tentative): Project Site Visit

Week 5 – Participation and Equity

One of the most important qualities of public sector scenario planning is the importance of democratic accountability, often achieved through stakeholder involvement or public participation. If one of the most important outcome of scenario planning is learning and other cognitive changes by decision-makers, participation is not only required for accountability but also for the efficacy of the method. At the interface of quantitative data and public understanding is the concept of indicators, which scenario planning practice relies on. We'll also consider the related issue of social equity this week.

Tues., Feb. 2:

1. Zapata, ETF Ch. 13.
2. Chakraborty, A. 2011. "Enhancing the Role of Participatory Scenario Planning Processes: Lessons From Reality Check Exercises." *Futures* 43 (4):387-399.
3. Innes, Judith E., and D.E. Booher. 2000. "Indicators for sustainable communities: a strategy building on complexity theory and distributed intelligence." *Planning Theory and Practice* 1 (2):173-186.
4. Tompkins, Emma L, Roger Few, and Katrina Brown. 2008. "Scenario-based stakeholder engagement: incorporating stakeholders preferences into coastal planning for climate change." *Journal of Environmental Management* 88 (4):1580-1592.
5. Baum, Howell S. 1999. "Forgetting to plan." *Journal of Planning Education and Research* 19 (1):2-14.

Additional Reading:

- Avin, Uri, Eli Knaap, Gerrit Knaap, Jason Sartori, Brad Barnett, Ken Snyder, Bruce Appleyard. *Equity in Scenario Planning*. Report. May 2014.

- Street, P. 1997. "Scenario Workshops: A Participatory Approach to Sustainable Urban Living?" *Futures* 29 (2):139-158.
- Perdicoulis, Anastassios, and John Glasson. 2011. "The Use of Indicators in Planning: Effectiveness and Risks." *Planning Practice and Research* 26 (3):349-367.
- Grant, ETF Ch. 3.

Thurs., Feb. 4: Scenario Narrative Exercise

- *A2 Scenario Definition Essay Due*

Lab 3: Scenario Narratives (start in class on Thursday, write-up due by Tues., Feb. 9)

Module 2: Contemporary Scenario Planning Practice Areas

Week 6 – Urban Land Use and Transportation

Two planning specialty areas which have adopted scenario planning methods are the related fields of transportation and land use planning. Given the strong linkages between land use patterns and transportation demand, they are frequently considered together, however given the siloed nature of U.S. planning, scenario planning can be also used for either sector alone.

Tues., Feb. 9: Lecture and Discussion

1. Bartholomew, K. 2007. "Land Use-Transportation Scenario Planning: Promise and Reality." *Transportation* 34 (4):397-412.
2. Zegras, C., J. Sussman, and C. Conklin. 2004. "Scenario Planning for Strategic Regional Transportation Planning." *Journal of Urban Planning and Development* 130:2.
3. U.S. Federal Highway Administration. 2010. *Scenario Planning Guidebook*. (skim) and review FHWA Scenario Planning Website: http://www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/

Additional Reading:

- Bartholomew, K., and R. Ewing. 2008. "Land Use-Transportation Scenarios and Future Vehicle Travel and Land Consumption: A Meta-Analysis." *Journal of the American Planning Association* 75 (1):13-27.
- Frank, Lawrence and Jared Ulmer. 2014. "Bridging to Public Health." *Planning* 80 (9): 12-16.

Thurs., Feb 11: Case Discussion, San Francisco Environment and Equity Scenario, Guest: Bob Allen, Urban Habitat

1. *Case documents on Canvas*

Lab 4: Building Types (due Tues., Feb. 16)

Week 7 – Climate Change, Anticipatory Governance and Robust Plans

The challenge of planning for climate change is transforming planning practice, and has also caused theorists to question the usefulness of scenario planning techniques. We consider this debate by studying a recent experimental project which sought to integrate climate change analysis into a regional transportation planning process.

Tues., Feb. 16: Lecture and Discussion

1. Quay, Ray. 2010. "Anticipatory Governance -- A Tool for Climate Change Adaptation." *Journal of the American Planning Association* 76 (4):496 - 511.
2. Chakraborty, Arnab, Nikhil Kaza, Gerrit-Jan Knaap, and Brian Deal. 2011. "Robust Plans and Contingent Plans -- Scenario Planning for an Uncertain World." *Journal of the American Planning Association* 77 (3): 251-266.
3. Condon, Patrick, Duncan Cavens, and Nicole Miller. 2009. *Urban Planning Tools for Climate Change Mitigation*. Policy Focus Report. Cambridge: Lincoln Institute of Land Policy.

Thurs., Feb. 18: Central New Mexico Climate Change Scenario Planning Project. Guest from US DOT Volpe Center

1. *Case documents on Canvas*
2. US Department of Transportation Volpe Center Project Website: <http://www.volpe.dot.gov/transportation->

[planning/public-lands/central-new-mexico-climate-change-scenario-planning-project](#)

3. Mid-Region Council of Governments of New Mexico Project Website: <http://www.mrcog-nm.gov/transportation/metro-planning/long-range-mtp?showall=&start=4>

Lab 5: Development Types (due Tues., Feb. 23)

Week 8 – Environmental Planning

The field of environmental planning as also adopted scenario methods, using it to explore uncertainty, scale, and normative concerns.

Tues., Feb. 23: Discussion and Lecture

1. Peterson, G.D., G.S. Cumming and S.R. Carpenter. 2003. "Scenario Planning: a Tool for Conservation in an Uncertain World." *Conservation Biology* 17(2): 358-366.
2. Biggs, R., et al. 2007. "Linking Futures across Scales: a Dialog on Multiscale Scenarios." *Ecology and Society* 12(1): 17.
3. Hopkins, Rob. "An Arc of Scenarios." In *The Localization Reader*, R. De Young, T. Princen eds. Cambridge, MA: MIT Press.
4. Bohensky, Erin L., Belinda Reyers, and Albert S. Van Jaarsveld. 2006. "Future Ecosystem Services in a Southern African River Basin: a Scenario Planning Approach to Uncertainty" *Conservation Biology* 20 (4):1051-1061.

Additional Readings:

- Nassauer, J.I. and R.C. Corry. 2004. "Using Normative Scenarios in Landscape Ecology." *Landscape Ecology* 19(4): 343-356.
- Alcamo, Joseph, and Thomas Henrichs. 2008. "Towards guidelines for environmental scenario analysis." In: *Environmental futures: The practice of environmental scenario analysis*, Ed. J. Alcamo, p 13-35.
- Hilde, Thomas, and Robert Paterson. 2014. "Integrating Ecosystem Services Analysis Into Scenario Planning Practice: Accounting for Street Tree Benefits With I-Tree Valuation In Central Texas." *Journal of Environmental Management* 146: 524-534.

Thurs., Feb. 25: Case: Land Use and Climate Change Scenarios for the Peninsular Florida Landscape Conservation Cooperative, Juan Carlos Vargas-Moreno and Michael Flaxman.

1. Rowland, Erika L., Molly S. Cross, Holly Hartmann. 2014. *Considering Multiple Futures: Scenario Planning to Address Uncertainty in Natural Resource Conservation*. Washington, D.C.: U.S. Fish & Wildlife Service. (skim)

Lab 6: Suitability Analysis (due Tues., March 8)

Week 9 – Spring Break

Module 3: Modeling Urban Scenarios

Week 10 – Introduction

Planners and designers have always desired tools to evaluate their proposals. Therefore, the field of modeling urban scenarios can draw on the large and diverse field of planning support systems and applied spatial analysis. After considering the role of these tools in context, students present in small groups on one of a set of planning tools used in professional practice.

Tues., March 8: New Tools for Scenario Planning in Context

1. Couclelis, H. 2005. "Where Has The Future Gone? Rethinking the Role of Integrated Land-Use Models in Spatial Planning." *Environment and Planning A* 37 (8):1353-1371.
2. Steinitz, Carl. 1990. "A Framework for Theory Applicable to the Education of Landscape Architects (and Other Environmental Design Professionals)." *Landscape Journal* 9 (2):136-143.
3. Walz, Ariane, Corina Lardelli, Heiko Behrendt, Adrienne Grêt-Regamey, Corinne Lundström, Susanne Kytzia, and Peter Bebi. 2007. "Participatory Scenario Analysis for Integrated Regional Modelling." *Landscape and Urban Planning* 81 (1–2):114-131.
4. Klosterman, R. E. 2012. "Simple and complex models." *Environment and Planning B: Planning and Design* 39 (1):1-6.

- Holway, Jim, C.J. Gabbe, Frank Hebbert, Jason Lally, Robert Matthews, and Ray Quay. 2012. *Opening Access to Scenario Planning Tools*. Policy Focus Report. Cambridge, Mass.: Lincoln Institute of Land Policy.

Additional Readings:

- California Department of Transportation. 2007. *Assessment of Local Models and Tools for Analyzing Smart-Growth Strategies*. Report. (skim)

Thurs., March 10: A2 Tool Report Presentations (group assignment, due in class)

CommunityViz

- Walker, Doug, and Thomas L. Daniels. 2011. *The Planners Guide to CommunityViz: The Essential Tool for a New Generation Of Planning*. Chicago: Planners Press, American Planning Association.
- Placeways LLC. 2012. Scenario 360 v. 4.3 Quick Reference Guide.
- Arciniegas, Gustavo, Ron Janssen, and Piet Rietveld. 2012. "Effectiveness of collaborative map-based decision support tools: Results of an experiment." *Environmental Modelling & Software* (0).
- Placeways LLC. 2011. CommunityViz White Paper: CommunityViz Indicators.
- Janes, George M., and Michael Kwartler. 2008. "Communities in Control: Developing Local Models Using CommunityViz." In *Planning Support Systems for Cities and Regions*, edited by R. K. Brail. Cambridge, Massachusetts: Lincoln Institute of Land Policy.
- Kwartler, Michael, and Robert N. Bernard. 2001. CommunityViz: An Integrated Planning Support System. In *Planning Support Systems: Integrating geographic information systems, models, and visualization tools*, edited by R. K. Brail and R. E. Klosterman. Redlands, Calif.: ESRI Press.

Index

- Criterion Planners. 2010. INDEX PlanBuilder Planning Support System Release 9.3: Indicator Dictionary.
- Allen, Eliot. 2001. INDEX: Software for Community Indicators. In *Planning Support Systems: Integrating geographic information systems, models, and visualization tools*, edited by R. Brail and R. Klosterman. Redlands, California: ESRI Press.
- Allen, Eliot. 2008. Clicking Toward Better Outcomes: Experience With INDEX, 1994-2006. In *Planning Support Systems for Cities and Regions*, edited by R. K. Brail. Cambridge, Massachusetts: Lincoln Institute of Land Policy.

What If?

- Klosterman, ETF Ch. 10.
- Pettit, Christopher J. 2005. "Use of a collaborative GIS-based planning-support system to assist in formulating a sustainable-development scenario for Hervey Bay, Australia." *Environment and Planning B: planning and design* 32 (4):523-545.

UrbanSim

- Waddell, P. 2002. "UrbanSim - Modeling urban development for land use, transportation, and environmental planning." *Journal of the American Planning Association* 68 (3):297-314.
- Waddell's consulting firm: <http://www.synthicity.com/>

Urban Strategy

- Dias, E., M. Linde, A. Rafiee, E. Koomen, H. Scholten. "Beauty and Brains: Integrating Easy Spatial Design and Advanced Urban Sustainability Models." In *Planning Support Systems for Sustainable Urban Development*, edited by S. Geertman, F. Toppen, J. Stillwell, 469-484. New York: Springer.
- Borst, J. et al. "Urban Strategy: Instrument for Interactive Spatial Planning." Report.

GeoDesign/GeoPlanner

- McElvaney, Shannon. 2012. *Geodesign: Case Studies in Regional and Urban Planning*. 1st ed. Redlands, Calif.: Environmental Systems Research Institute.
- Steinitz, Carl. 2012. *A Framework for Geodesign: Changing Geography By Design*. 1st ed. Redlands, Calif: ESRI.
- ESRI Geodesign Information & Geodesign Summit Videos: <http://www.esri.com/products/technology-topics/geodesign>

Envision Tomorrow + (not included in this assignment since we are using it)

- Fregonese Associates. 2012. Envision Tomorrow Prototype Builder User Guide Version 3.1 Beta.
- Fregonese Associates. 2012. Envision Tomorrow Scenario Builder User Guide.
- Tool website: <http://www.envisiontomorrow.org/>

Week 11 – SP & Advanced Modeling Tools

Although the hands-on coursework will use sketch-planning tools, this week we will consider a class of models which attempt to model urban land use and transportation systems.

Tues., March 15: Urban Modeling Overview Discussion

1. Landis, J.D. 2011. "Urban Growth Models: State of the Art and Prospects." In *Global urbanization*, edited by Eugenie L. Birch and Susan M. Wachter, 126-150. Philadelphia: University of Pennsylvania Press.
2. Harris, Britton, and M Batty. 1993. "Locational Models, Geographic Information and Planning Support Systems." *Journal of Planning Education and Research* 12 (3):184.
3. Lee, Douglass B. 1973. "Requiem for Large-Scale Models." *Journal of the American Planning Association* 39 (3):163.
4. Lee, Douglass B. 1994. "Retrospective on Large-Scale Urban Models." *Journal of the American Planning Association* 60 (1):35.
5. Schwarz, N., D. Haase, and R. Seppelt. 2010. "Omnipresent Sprawl? A Review Of Urban Simulation Models With Respect To Urban Shrinkage." *Environment and Planning B: Planning and Design* 37 (2):265-283.

Thurs., March 17: Scenario Construction

Lab 7: Scenario Construction (start in class, write-up due March 24)

Additional Resources

- Echenique, M.H., A.J. Hargreaves, G. Mitchell, and A. Namdeo. 2012. "Growing Cities Sustainably." *Journal of the American Planning Association* 78 (2):121-137. (one of the most controversial JAPA papers in the past decade)
- Nostikasari, Dian. 2015. "Representations of everyday travel experiences: Case study of the Dallas-Fort Worth Metropolitan Area." *Transport Policy* 44:96-107.
- Klosterman, Richard E. 1994. "An Introduction to the Literature on Large-Scale Urban Models." *Journal of the American Planning Association* 60 (1):41.
- Swartz, Peter Goodings, and P. Christopher Zegras. 2013. "Strategically Robust Urban Planning? A Demonstration of the Concept." *Environment and Planning B: Planning and Design* 40 (5):829-845.

Week 12: Systems Dynamics & Analysis Tools

While many of the urban models discussed in Week 10 draw on economic theory to simulate development or travel behavior, other modeling approaches are possible. This week we consider system dynamics models, as well as student-provided analysis tools.

Tues., March 22: System Dynamics Lecture and Discussion

1. Chapter 5, "A Shift of Mind," in Senge, Peter. 2010. *The Fifth Discipline: The Art & Practice of The Learning Organization*. New York: Crown Publishing Group.
2. Zellner, Moira L., Leilah B. Lyons, Charles J. Hoch, Jennifer Weizeorick, Carl Kunda, and Daniel C. Milz. 2012. "Modeling, Learning, and Planning Together: An Application of Participatory Agent-based Modeling to Environmental Planning." *URISA Journal* 24 (1):77-92.
3. Chapter 2 and 7 in Van den Belt, Marjan. 2004. *Mediated Modeling: A System Dynamics Approach To Environmental Consensus Building*. Washington, DC: Island Press.
4. te Brömmelstroet, M., and P. M. Schrijnen. 2010. "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.

Thurs., March 24: Analysis Tools Show-and-Tell

- *Students should prepare a short overview of an analysis tool of their choosing which could be useful for scenario planning*

Lab 8: Scenario Analysis (due Tues., March 29)

Additional Reading

- Deal, Brian and Varkki Pallathucheril, "Simulating Regional Futures: The Land-use Evolution and impact Assessment Model (LEAM)," in: *Planning Support Systems for Cities and Regions*. Ed: Brail, Richard K. 2008. Cambridge, Mass.: Lincoln Institute of Land Policy. (See also LEAM Website: <http://www.learm.illinois.edu/learm>)
- Landis, John. "CUF, CUF II, And CURBA: A Family of Spatially Explicit Urban Growth and Land-Use Policy Simulation Models," In *Planning Support Systems: Integrating Geographic Information Systems, Models, and Visualization Tools*, Edited by Richard K. Brail and Richard E. Klosterman, 2001, ESRI Press: Redlands, California.

Module 4: Advancing Practice & Final Presentations

Week 13: Scenario Visualization and Communication

Communicating the results of a scenario planning analysis is one of the most important skills for a successful project. This week students complete a lab and continue developing their project.

Tues., March 29: Discussion

1. Cummings, ETF Ch. 12.
2. Haas Lyons, Susanna, Mike Walsh, Erin Aleman, and John Robinson. 2014. "Exploring regional futures: Lessons from Metropolitan Chicago's online MetroQuest." *Technological Forecasting and Social Change* 82: 23-33.
3. Senbel, Maged, and Sarah P. Church. 2011. "Design Empowerment: The Limits of Accessible Visualization Media in Neighborhood Densification." *Journal of Planning Education and Research* 31 (4): 423-437.
4. Chapter 6, "Representation," in Peattie, Lisa Redfield. 1987. *Planning: Rethinking Ciudad Guayana*. Ann Arbor: University of Michigan Press.

Additional Reading

- Salter, J.D., C. Campbell, M. Journey, and S.R.J. Sheppard. 2009. "The Digital Workshop: Exploring The Use of Interactive and Immersive Visualization Tools In Participatory Planning." *Journal of Environmental Management* 90 (6):2090-2101.
- Pettit, C.J., C.M. Raymond, B.A. Bryan, and H. Lewis. 2011. "Identifying Strengths and Weaknesses of Landscape Visualization for Effective Communication of Future Alternatives." *Landscape and Urban Planning*.

Thurs, March 31: Scenario Visualization Part 1

1. Chapters 1-4 in Atkinson, Cliff. 2011. *Beyond Bullet Points: Using Microsoft Powerpoint To Create Presentations That Inform, Motivate, And Inspire*. Redmond, Wash.: Microsoft Press. Available Online: <http://proxy.lib.umich.edu/login?url=http://proquest.safaribooksonline.com/9780735660052>.

Lab 9: Scenario Visualization & Communication (start in class, individual part 2 due Tues., April 7)

Week 14: Scenario Planning as a Sociotechnical Infrastructure

Discussions of scenario methodologies and modeling can lose sight of the fact that planning is an institutionalized practice which must be conducted with the associated resources and constraints. This week we return to the context of planning, considering scenario planning as a sociotechnical infrastructure.

Tues., April 5: SP Infrastructures in Theory and Practice

1. Moore, Terry. 2008. "Planning Support Systems: What Are Practicing Planners Looking For?" In *Planning Support Systems for Cities and Region*, edited by Richard Brail. Cambridge, MA: Lincoln Institute of Land Policy.
2. Guhathakurta, S. 1999. "Urban Modeling and Contemporary Planning Theory: Is There a Common Ground?" *Journal of Planning Education and Research* 18 (4):281-292.

3. Knaap, Gerrit-Jan, and Rebecca Lewis. 2011. "Regional Planning for Sustainability and the Hegemony of Metropolitan Regionalism." In *Regional Planning in America: Practice and Prospect*, edited by Ethan Seltzer and Armando Carbonell, 176-221. Cambridge, MA: Lincoln Institute of Land Policy.
4. Goodspeed, Robert. 2013. "A Survey of U.S. Metropolitan Spatial Planning Infrastructures: Institutions, Models, and Tools." Paper presented at the 13th International Conference on Computers in Urban Planning and Urban Management, Utrecht, Netherlands.
5. Transportation for America. 2014. *The Innovative MPO: Smart Planning, Strong Communities*. Report. (skim)

Thurs., April 7: Draft Presentation

Additional Resources

- Guhathakurta, Subhrajit. 2003. *Integrated Land Use and Environmental Models: A Survey of Current Applications and Research*. New York: Springer.
- Williamson, W. and B. Parolin. "Application of Socio-Technical Research Methods in Understanding the Genesis and Potential Sustainability of Planning Support Systems." In *Planning Support Systems for Sustainable Urban Development*, edited by S. Geertman, F. Toppen, J. Stillwell, 417-432. New York: Springer.
- Zhu, Y., M. Diao, J. Ferreira, W. Li and S. Jiang. "Flexible Geospatial Platform for Distributed and Collaborative Urban Modeling." In *Planning Support Systems for Sustainable Urban Development*, edited by S. Geertman, F. Toppen, J. Stillwell, 375-394. New York: Springer.
- Meadows, Donella H., and Jennifer M. Robinson. 2002. "The Electronic Oracle: Computer Models and Social Decisions." *System Dynamics Review* 18 (2):271-308. (see also the full book of which this is an excerpt)
- Vonk, Guido, Stan Geertman, and Paul Schot. 2007. "New Technologies Stuck in Old Hierarchies: The Diffusion of Geo-Information Technologies in Dutch Public Organizations." *Public Administration Review* 67 (4):745-756.
- Vonk, Guido, Stan Geertman, and PP Schot. 2005. "Bottlenecks blocking widespread usage of planning support systems." *Environment and Planning A* 37 (5):909-924.

Week 15: Learning and Final Presentation

Tues., April 12: Discussion of Theory and Research on Scenario Planning and Learning

1. Chermack, TJ, and L Van Der Merwe. 2003. "The role of constructivist learning in scenario planning." *Futures* 35 (5):445-460.
2. Selin, Cynthia. 2006. "Trust and the illusive force of scenarios." *Futures* 38 (1):1-14.
3. Hulme, Mike, and Suraje Dessai. 2008. "Predicting, deciding, learning: can one evaluate the 'success' of national climate scenarios?" *Environmental Research Letters* 3 (4):045013.

Additional Resources

- Chermack, T.J. 2004. "A theoretical model of scenario planning." *Human Resource Development Review* 3 (4):301-325. *Chermack has authored a number of papers on theoretical aspects of scenario planning.*
- Goodspeed, Robert. 2015. "Sketching and learning: A planning support system field study." *Environment and Planning B: Planning and Design*. doi: 10.1177/0265813515614665.
- Min, Kyeong Sam and Hal R. Arkes. 2012. "When is Difficult Planning Good Planning? The Effects of Scenario-Based Planning on Optimistic Prediction Bias." *Journal of Applied Social Psychology* 42: 11, 2701-2729
- Zegras, Christopher, and Lisa Rayle. 2012. "Testing The Rhetoric: An Approach To Assess Scenario Planning's Role As A Catalyst For Urban Policy Integration." *Futures* 44 (4):303-318.

Thurs., April 14: Semester Debriefing

Wed., April 20th, 1:30 – 3:30 PM: A3 Stakeholder Presentation (final exam time)