“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.”


**Course Staff and Schedule**

Instructor: Prof. Robert Goodspeed (rgoodspe at umich.edu)
Office: 2223C Art & Architecture Building
Office Hours: T&Th 3:40 – 5:00 PM (sign up by Canvas link)
Credits: 3
Prerequisites: UP 506 or NRE 531, or permission of the instructor

**Class Schedule:** Tuesday and Thursday, 9 – 10:30 AM, Room 2222 Art & Architecture Building

**Summary and Learning Objectives**

Growing uncertainty about the future has made considering the long-term implications of public actions 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. Instead of proposing only a most likely or must desired future scenario, practitioners using scenario planning seek to 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 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 applications of the method in various sub-fields of urban planning, (3) an exploration 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 540 (Planning Theory) and UP 506 (Intro. to GIS) or equivalent courses are required prerequisites. Students without these prerequisites but with adequate background in these topics can enroll with the permission of the instructor.

**Materials**

**Textbooks**


**Additional Text**

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)
- 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)

Assignments
- Class Attendance and Participation (10%)
- Discussion Posts: Before or after any class session with readings (including cases), students should post 250-word response, reaction, or question emerging from the materials. (10%)
- Assignments: See below: Futures Method Report, Tool Report, Final Presentation. (30%)
- Laboratory Assignments: (9) (50%)

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 responds to planning’s concern with holistic analysis, future-oriented thinking, and the importance of uncertainty. Scenario planning most accurately refers to a diverse area of planning practice which involves a diverse array 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 three cases: Envision Utah, Great Lakes Shorelands, and the Central New Mexico Climate Change project. 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: a predictive scenario will forecast the future, and a trend scenario will propose how the neighborhood might be transformed. If allowed by sufficient class size, the class may also create an explorative scenario to test strategic possibilities (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.

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 in small groups to construct four scenarios by selecting two major uncertainties and placing them on two axes.

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.

A2 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 two 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.

**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

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<td>Introduction</td>
<td>A1: Futures Method Report</td>
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<td>2</td>
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<td>SP and Its Alternatives</td>
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<td>4. Advancing Practice &amp; Final Presentations</td>
<td>Close &amp; Party</td>
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Overview of Laboratory Assignments

1. Stakeholder Assessment (I)
2. Project Context Research (I)
3. Scenario Narrative Development (G)
4. Building Types (I)
5. Development Types (I)
6. Suitability Analysis (I)
7. Scenario Construction (G)
8. Scenario Analysis (I)
9. Scenario Visualization & Communication (G/I)

A1 Futures Methods Report (G)
A2 Tool Reports (G)
A3 Final Presentation (G)

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

<table>
<thead>
<tr>
<th>Reading/ Lectures</th>
<th>Land Use and Environment Pl.</th>
<th>Housing, Comm. &amp; Econ. Dev.</th>
<th>Global and Comparative</th>
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<td>L5 Development Types, L6 Suitability Analysis, L7 Scenario Const.</td>
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<td>L2, Site Analysis, L5 Devt Types, L9 Visualization</td>
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<td>Envision Tomorrow</td>
<td>Central New Mexico</td>
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</table>

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.

Thurs., Jan. 8: Introduction

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 nature of the method they have chosen.

Tues., Jan. 13: Lecture and Discussion, “Thinking About the Future in Planning”
1. Hopkins and Zapata, ETF Ch. 1

Thurs., Jan. 15: A1 Futures Method Reports (due in class)

Visioning

Strategic Planning

General and Comprehensive Planning

Forecasting
- Isserman, ETF Ch. 9

**Utopian Imagination**

**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 consider how the ideas have been applied to planning, especially in the European context, where in the postwar period the state has taken a central role in shaping urban structure.

**Tues., Jan. 20: Lecture and Discussion**

**Thurs., Jan. 22: Lecture and Discussion**
1. Smith, ETF Ch. 5

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

**Additional References:**

**Management Focus**

**National-scale Focus**

**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. 27:**
4. Cummings, ETF Ch. 12.

Additional Reading:

Thurs., Jan. 29: Project Context Presentations and Discussion

Lab 2: Project Context Research (due in class)

**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. 3:
1. Grant, ETF Ch. 3.
2. Zapata, ETF Ch. 13.

Additional Reading:

Thurs., Feb. 5: Scenario Narrative Exercise

Lab 3: Scenario Narratives (start on Thursday, write-up due by Tues., Feb. 10)

**Module 2: Contemporary Scenario Planning Practice Areas**

**Week 6 – Environmental Planning**

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

Tues., Feb. 10: Discussion and Lecture


Additional Readings:


Lab 4: Building Types (due Tues., Feb. 17)

Week 7 – 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 used for either sector alone.

Tues., Feb. 17: Lecture and Discussion
1. Avin, ETF Ch. 6.

Additional Reading:

Thurs., Feb 19: Case Discussion, Envision Utah

Lab 5: Development Types (due Tues., Feb. 24)

Week 8 – Climate Change, Anticipatory Governance and Robust Plans
The challenge of planning for climate change is transforming planning practice, and has also caused theorists 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. 24: Lecture and Discussion
Thurs., Feb. 26: Central New Mexico Climate Change Scenario Planning Project. Guest from US DOT Volpe Center
2. 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 6: Suitability Analysis (due Tues., March 10)

Additional Resources:
- Lempert, Robert J., S. Popper, S. Bankes. Shaping the Next One Hundred Years: New Methods for Quantitative, Long-Term Policy Analysis. Santa Monica, Calif.: RAND.

Module 3: Modeling Urban Scenarios

Week 9 – 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, which some theorists have recently dubbed “GeoDesign.” After considering the role of these tools in context, students present in small groups on one of a set of sketch-planning tools which are used in professional practice.


Additional Readings:

Thurs., March 12: A2 Tool Report Presentations (group assignment, due in class)

CommunityViz
- Placeways LLC. 2012. Scenario 360 v. 4.3 Quick Reference Guide.

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What If?
• Klosterman, ETF Ch. 10.

Additional Resources:
• 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)
• Tool website: http://www.envisiontomorrow.org/

Week 10 – 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. After a general discussion of these models and the famous critique of “large-scale models” by Lee, we consider two in detail: UrbanSim and Urban Strategy.

Tues., March 17: Urban Modeling Overview Discussion

Thurs., March 19: Scenario Construction and Discussion of UrbanSim, Urban Strategy

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

Additional Resources

**Week 11: Systems Dynamics & Spatial Modeling**

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 two: spatially-explicit models like LEAM, as well as systems dynamics models.

**Tues., March 24: Spatial Models Lecture and Discussion**
1. Deal and Pallathucheril, ETF Ch. 11.
3. LEAM Website: [http://www.leam.illinois.edu/leam](http://www.leam.illinois.edu/leam)

**Thurs., March 26: Systems Dynamics Lecture and Discussion**

**Lab 8: Scenario Analysis (due Tues., March 31)**

**Module 4: Advancing Practice & Final Presentations**

**Week 12: 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 31: Discussion**
1. Cummings, ETF Ch. 12.

**Additional Reading**

**Thurs, April 2: Scenario Visualization Part 1**
Week 13: Scenario Planning as a Sociotechnical Infrastructure

Discussions of scenario methodologies and modeling can lose sight of the fact that planning is an institutionalized practice. This week we return to the contexts of planning, considering scenario planning as a sociotechnical infrastructure.

Tues., April 7: SP Infrastructures in Theory and Practice


Thurs., April 9: Draft Presentation

Additional Resources


Week 14: Learning and Final Presentation

Tues., April 14: Discussion of Theory and Research on Scenario Planning and Learning


Additional Resources

Thurs., April 16: A3 Stakeholder Presentation

**Week 15**

Tues., April 21: Semester Debriefing & Party