11.123 Big Plans: Adapting to Climate Change

MIT Department of Urban Studies and Planning
Spring 2016

Tue, Thu, 9:30 - 11:00am, Room 9-451
Units 3-0-6, HASS

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Office Hours: TBD

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“Make no little plans; they have no magic to stir men's blood and probably will themselves not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will not die.”

- Daniel Burnham

With over half the world living in cities, the processes and challenges of urbanization touch on every aspect of modern society. Cities in Asia and other parts of the Global South are growing at unprecedented speeds and scales, while others in post-industrialized regions face the challenge of declining populations and investment. Large urban regions can offer agglomeration economies, cultural vibrancy and diversity, and the potential for environmental sustainability through compact development. At the same time, climate change is already imposing exponentially increasing economic damages on urban regions, many of the largest of which are located in or along rivers, deltas, and coastlines. Within 50 to 100 years, an increase of 2-4°C in global average temperature could cause 5 feet or more of sea level rise, fundamentally affecting the geography of the places that can be inhabited, developed, or protected.

The convergence of these major environmental, social, and economic trends makes for some of the most intractable challenges confronting modern society. Throughout history, complex issues such as these have inspired big urban plans that have captured society’s imagination with their technological promise and physical scale of reform. Over time, however, there has been growing pushback from community and environmental activists about the insensitivity of Big Plans, as well as a shifting in urban governance from the state to private and nongovernmental actors. It would seem that Big Plans have never been more necessary, yet are increasingly more complex to develop and implement.

In this undergraduate course, we explore these themes through the lens of planning for climate adaptation in coastal cities. Roughly half of the classes will feature lectures by the instructors, urban designers, and other practitioners. These presentations will highlight past visions for managing urban environmental challenges, the different approaches to coastal resiliency planning today, and the complexity of developing and implementing large-scale plans. The other half of the course features a term-long workshop project that envisions MIT’s campus for its next century - in the year 2100 and beyond, when MIT may be periodically inundated by rainfall, river flows, and/or storm surge. In these workshop sessions, we will apply the analytical perspectives learned from the lectures and discussions to MIT’s climate change adaptation challenges.
Throughout the course, we'll consider the following questions:

- What makes a plan "Big", what makes it a "Plan"?
- Who leads Big Planning, and who benefits and loses from Big Plans?
- At what scales of time and space do we evaluate Big Plans?
- Why do Big Plans so often fail or exacerbate existing challenges?
- How can Big Plans be ambitious, but also sensitive?

As our jumping off point, the recently completed Cambridge Climate Vulnerability Assessment was "a technical study of the Cambridge population, infrastructure, public health, and local economy in terms of risks and vulnerabilities to impacts resulting from increased temperatures, more intense storms, and storm surge flooding associated with sea level rise." This winter, the City is pivoting towards a preparedness, resilience, and general master plan. In parallel, MIT is developing a better understanding of what climate vulnerability means for its students, buildings, open spaces, and academic/research continuity. We ask you to imagine how bold moves like the creation of the modern Charles River basin or placing a time capsule in 1957 for the next millennium under MIT.nano can provide the aspiration and inspiration to inform our Big Plans for MIT 2100.

We will embrace a wide variety of skills, interests, and backgrounds to inform each team's Big Plan - students from all departments are welcome. Classroom discussions, debates, and design exercises help students develop a nuanced appreciation for the political complexity of large scale planning processes and impacts. At the end of the semester, student teams will present their plans to invited jurors, and submit individual essays evaluating their plan given the themes of the course.

Through this class, you will develop an introductory grasp of the common skills used by planners: mapping data, analyzing a site, establishing a vision, addressing stakeholder concerns, evaluating impacts, drafting implementation strategies, and presenting your design concept in a public forum. In addition, you will gain an appreciation for how to evaluate the emerging efforts that promote cities' climate resilience. Whether you pursue planning as a career or never take another planning class, these skills will make you a more reflective and effective resident of cities where these plans are taking place.

Course Deliverables

We will provide in-depth descriptions at the beginning of the semester for each of the deliverables, but for now, as an overview, you can anticipate the following assignments:

- **Plan Jam** (due either March 8 or April 5, in pairs)
  Choose either "Megaprojects for Resilience" or "Grassroots Community Plans" and develop a short case study. You and your partner will write up one paragraph about the issue planners are facing in a particular city, and a second paragraph describing how the city solved the problem, and how you might have come up with alternative solutions. In class, present up to five slides on the case. At the end of the semester, we will have a discussion, "Competing Visions, One Plan" informed by your findings on each of these issues.

- **Four Project Workshops** (various due dates)
  Deliverables will vary by week, and are intended to be cumulative as your group moves towards the final projection presentation and reflection essay.

- **Final Group Project Presentation** (May 2 at 11:59pm)
  Student teams will develop a realistic proposal that advocates for their group's particular perspective, given long-term uncertainties because of climate change. The plan can be in the form of a PowerPoint presentation that will be presented to the class with an invited jury.
Final Project Individual Reflection Essay (May 12 at 11:59pm)

Come up with a concise definition of what you think is a Big Plan, and then critically evaluate your proposal based on this definition. Thoroughly substantiate your definition of Big Plans based on the reading and the case material. Analyze the tradeoffs the team made in pursuit of social, environmental, and economic development goals, and foreseeable challenges to adopting the proposal. Use clear writing organization and language, as well as formal citations and bibliography. Essays will be 8- to 10-pages double spaced.

Key Course Dates
by Feb 12 Meet with Linda and/or Mike
by Feb 23 Form Teams
Mar 1 Big Problem Statement
Mar 8 Plan Jam 1 (Half of the Class to Present)
Mar 17 Big Idea Statement
Apr 5 Plan Jam 2 (Half of the Class to Present)
Apr 7 Public Benefits
Apr 14 Implementation Strategy
Apr 26/28 Draft Presentations Due (Half of the Class to Meet Each Date)
May 2 Final Group Project Presentations Due (at 11:59pm)
May 3 Final Group Project Presentations (Extended Class)
May 12 Final Project Individual Reflection Essay Due (at 11:59pm)

Evaluation and Grading

- Plan Jam 10%
- Project Workshops 20%
- Final Group Project Presentation 20%
- Final Individual Reflection Essay 30%
- Participation 20%

Course Administrative Policies

Class Participation

- Participation is very important in this class. Your participation grade will reflect your level of engagement during discussions of readings, guest lectures, project workshops, and peer presentations.
- We expect you to read approximately 60 pages per week; if more pages are assigned, please at least skim all required readings.
- You should plan to meet with one or both of the instructors during their office hours by February 12. It can just be for 10 or 15 minutes, but we want to get to know you! We will arrange these meetings and office hours via a shared Google Calendar here: http://tinyurl.com/ogx695t
- Attendance is an important part of your participation grade as well. More than three sessions of unexcused absences, or excessive lateness, will be grounds for grade penalties.

Laptops and phones

As much as we love these modern conveniences, they can get in the way of discussion. Please keep them quiet and your activities limited to those that are of benefit to the class and your learning.
Writing Guidelines and Help
All written assignments should include references and citations, and use APA conventions. The MIT Writing and Communication Center (12-132) [http://writing.mit.edu/wcc](http://writing.mit.edu/wcc) offers professional advice from published writers about oral presentations and about all types of academic, creative, and professional writing. On writing a position paper/memo, see [some helpful tips from HKS here](http://writing.mit.edu/wcc).

Disabilities
If you have a documented disability, or any other problem you think may affect your ability to perform in class, please see us early in the semester so that arrangements may be made to accommodate you. For MIT’s policy on accommodations for disabilities, see [http://mit.edu/uaap/sds/students](http://mit.edu/uaap/sds/students).

Academic Misconduct
Plagiarism and cheating are both academic crimes. Never 1) turn in an assignment that you did not write yourself, 2) turn in an assignment for this class that you previously turned in for another class. If you do so, it may result in a failing grade for the class, and possibly even suspension. Please see us if you have any questions about what constitutes plagiarism. Anyone caught plagiarizing or cheating will be reported to the provost in line with recognized university procedures. For MIT’s guidelines for academic integrity, see [http://web.mit.edu/academicintegrity](http://web.mit.edu/academicintegrity).
## Course Overview

*Please note that the schedule is subject to change.*

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATE</th>
<th>LECTURES</th>
<th>WORKSHOPS</th>
<th>DELIVERABLES</th>
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<tbody>
<tr>
<td>W1</td>
<td>02.02</td>
<td>Course Introduction&lt;br&gt;02.04 Historic Response to Environmental Challenges: “Inventing the Charles River”</td>
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<td>Meet with Mike or Linda during office hours before President’s Day Weekend</td>
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<td>W2</td>
<td>02.09</td>
<td>Mandates for Change: The Nexus of Law and Big Infrastructure with the Boston Harbor Cleanup</td>
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<td>02.11</td>
<td>An Uncertain Future: Climate Change Planning in Boston and Cambridge</td>
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<td>W3</td>
<td>02.16</td>
<td>NO CLASS - PRESIDENT’S’ DAY</td>
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<td>02.18</td>
<td>MIT 2100: Introduction to Term Project</td>
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<td>W4</td>
<td>02.23</td>
<td>Mapping MIT: Method Workshop</td>
<td>Form Teams</td>
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<td></td>
<td>02.25</td>
<td>Mapping MIT: Site Visit</td>
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<td>W5</td>
<td>03.01</td>
<td>Site / SWOT Analysis</td>
<td>Big Problem Statement</td>
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<td>03.03</td>
<td>New York’s Post-Industrial Waterfront (Protect)</td>
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<td>W6</td>
<td>03.08</td>
<td>Plan Jam: Mega-Projects for Resilience (Defend)</td>
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<td>03.10</td>
<td>Room for the River: Dutch Model (Accommodate)</td>
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<td>W7</td>
<td>03.15</td>
<td>Retrofitting New Orleans for Water (Retreat)</td>
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<td>03.17</td>
<td>Planning Concept&lt;br&gt;03.17 Planning Concept</td>
<td>Idea Statement</td>
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<td>W8</td>
<td>03.22</td>
<td>NO CLASS - SPRING BREAK</td>
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<td>03.24</td>
<td>NO CLASS - SPRING BREAK</td>
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<td>W9</td>
<td>03.29</td>
<td>Master Planning: Imagine Boston 2030</td>
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<td>03.31</td>
<td>Public-Private Development: Boston Harborwalk</td>
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<td>Week</td>
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<td>W10</td>
<td>04.05</td>
<td>Plan Jam: Opposition to Environmental Projects</td>
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<td>04.07</td>
<td>Stakeholder Analysis</td>
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<td>W11</td>
<td>04.12</td>
<td>Discussion: Implementation Strategies of Cases</td>
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<td>04.14</td>
<td>Implementation and Phasing</td>
<td>Implementation Strategy</td>
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<td>W12</td>
<td>04.19</td>
<td>NO CLASS - PATRIOTS' DAY</td>
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<td>04.21</td>
<td>Discussion: Competing Visions, One Plan?</td>
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<td>W13</td>
<td>04.26</td>
<td>Practice Presentations (Half of the Class)</td>
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<td>04.28</td>
<td>Practice Presentations (Other Half of the Class)</td>
<td>Desk Crits</td>
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<td>Draft Presentation</td>
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<td>W14</td>
<td>05.03</td>
<td>EXTENDED CLASS (8-11AM)</td>
<td>Final Project Presentations</td>
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<td>05.05</td>
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<td>In-Class Negotiations</td>
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<td>W15</td>
<td>05.10</td>
<td>Evaluating Big Plans</td>
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<td>05.12</td>
<td>Discussion: The Future of Big Planning</td>
<td>Final Individual Papers</td>
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Course Schedule & Readings

*Please note that the readings will be updated prior to the start of the semester.*

**Feb 2**  
Course Introduction  
Questions of the Day  
- What is climate adaptation planning?  
- What is resilience? What is robustness?  
Recommended Readings  
Additional Readings

**Feb 4**  
**Historic Responses to Urban Environmental Challenges: “Inventing the Charles River”**  
Questions of the Day  
- How have Big Plans of the past addressed major urban environmental challenges?  
- How can we see the invention of the Charles River and MIT’s campus as a Big Plan?  
Required Readings  
Additional Readings  

**Feb 9**  
**Mandates for Change: The Nexus of Law and Big Infrastructure with the Boston Harbor Cleanup**  
Questions of the Day  
- How did the Boston region come together to solve its wastewater issue?  
- What co-benefits has infrastructure unlocked along the waterfront?  
Required Readings  
Additional Readings

**Feb 11**  
**An Uncertain Future: Climate Change Planning in Boston and Cambridge**  
Questions of the Day  
- What is the state of the art in climate resilience and adaptation planning?  
- Where does the Boston region stand relative to other geographies?  
Required Readings  
Additional Readings

**Feb 16**  
**NO CLASS - PRESIDENT’S DAY**  
*[Meet with Mike and/or Linda before this Weekend]*

**Feb 18**  
**MIT 2100: Introduction to Term Project**  
Questions of the Day  
- What climate vulnerabilities does MIT face?  
- What do you think the future of the campus will be?  
Please See Project Description for More Information

**Feb 23**  
**Mapping MIT: Method Workshop**  
Questions of the Day  
- What are the key features of MIT’s campus, from a planning perspective?  
- How do people see a city? How can we visually read and analyze a site?
How can we use data to understand and document a site from afar?

Please See Project Description for More Information

Feb 25  **Mapping MIT: Site Visit**

Please See Project Description for More Information

Mar 1  **Workshop: Site and Strengths, Weaknesses, Opportunities, and Threats Analyses**

Questions of the Day

- What challenges does the site face and opportunities does it afford? How did your understanding of MIT evolve after seeing it from a new perspective?
- What key planning issue will your group focus on?

Please See Project Description for More Information

Mar 3  **Planning the Post-Industrial Waterfront: NYC Post-Sandy (Protect)**

Question of the Day

- As our urban waterfronts transition from industrial to other uses, what are their challenges and opportunities? And susceptibility to climate change?

Required Readings

Additional Readings

Mar 8  **Plan Jam: Megaprojects for Resilience (Defend)**

Questions of the Day

- How have planners proposed infrastructure to defend cities against storm surge and sea level rise?
- Why are large-scale infrastructure projects seemingly doomed to cost overruns and schedule delays? Is adaptive management a viable solution?

Required Readings

Additional Readings

Mar 10  **Room for the River: The Dutch Model (Accomodate)**

Guest Lecture: TBD

Questions of the Day

- In what ways can a new city be designed to accommodate water?
- What are key lessons to be learned from state-led planning?

Required Readings

Additional Readings

Mar 15  **Retrofitting New Orleans for Water (Retreat)**

Guest Lecture: Zachary Lamb, Doctoral Student, DUSP

Question of the Day

- Given political and geomorphological realities, is retreat an option for some regions?
- How can planning processes proactively incorporate the interests of the urban poor?

Required Readings

Additional Readings

Mar 17  **Workshop: Planning Concept**

Please See Project Description for More Information
Mar 22  NO CLASS, SPRING BREAK

Mar 24  NO CLASS, SPRING BREAK

Mar 29 Master Planning: Imagine Boston 2030
   Guest Lecture: TBD
   Question of the Day
   ● With both Cambridge and Boston undergoing comprehensive master planning processes, what’s changed and what’s the same?
   Required Readings
   Additional Readings

Mar 31 Public-Private Development: Boston Harborwalk
   Guest Lecture: TBD
   Question of the Day
   ● How can the public and private sectors come together to produce development that shares risks and benefits the entire community?
   Required Readings
   Additional Readings

Apr  5 Plan Jam: Opposition to Environmental Projects
   Question of the Day
   ● What locally inspired plans have changed the face of the Boston region? How has opposition changed the course of Big Plans?
   Required Readings
   Additional Readings

Apr  7 Workshop: Identifying Stakeholders and Public Benefits
   Questions of the Day
   ● How can stakeholders inform the shape of a project?
   ● How can the proposed benefits from a project be guaranteed to be delivered?
   Please See Project Description for More Information

Apr 12 Discussion: Implementation Strategies of Cases
   Question of the Day
   ● What strategies have the various projects we’ve discussed this semester deployed to ensure successful implementation? How has success been defined, and for whom?
   Required Readings
   Additional Readings

Apr 14 Workshop: Implementation and Phasing
   Please See Project Description for More Information

Apr 19  NO CLASS - PATRIOTS’ DAY
Apr 21  Discussion: Competing Visions, One Plan?
  Question of the Day
  ● How can Big Plans overcome the challenges of the democratic process to build coalitions and deal with competing visions?
  Required Readings
  Additional Readings

Apr 26/28 Practice Presentations
  We will not meet as a class this week. Half of the teams will meet with the instructors to present their draft presentations in the Tuesday class, and the other half will do likewise Thursday.

[May 2 Final Project Presentations Due at 11:59PM]

May 3 Final Project Presentations
  [Note: This is an extended 3-hour class from 8-11AM]

May 5 In-Class Negotiations
  Question of the Day
  ● How does your group’s vision measure up to the other plans presented? On what could your group compromise to make a unified plan and what are its non-negotiables?
  Please See Project Description for More Information

May 10 Evaluating Big Plans
  Questions of the Day
  ● What are the dominant narratives behind the failures of planning? And success stories?
  ● How can planning find solutions for the world’s challenges within itself?
  Required Readings
  Additional Readings

May 12 Discussion: The Future of Big Planning (and the Role of Planners and Engineers)
  Questions of the Day
  ● What is the role of the planner - facilitator, convener, visionary, advocate?
  ● How do the plans we’ve examined to date seek to advance a more just city? Is this or should this be an explicit goal?
  Required Readings
  ● American Institute of Certified Planners Code of Ethics
  ● National Society of Professional Engineers Code of Ethics

[May 12 Final Individual Project Response Papers Due at 11:59PM]