UEP 224/PH 288
Public Health and the Built Environment

Instructor
Prof Mary Davis
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Office hours: Wednesdays 9-11am

Class Meeting Schedule and Location
Tuesdays and Thursdays, 10:30-11:45am @ 97 Talbot Ave (Brown House)

Course Description
The epidemics of asthma, diabetes, and obesity have focused new attention on the role played by suburban sprawl, transportation, and other built environment features on human health. This course will explore the linkages between the built environment and human health from a policy and planning perspective, with a particular focus on the U.S. urban health context. We will review a range of public health topics, including the benefits of nature, the negative effects of air and noise pollution, water and food systems challenges, and climate change. Guest lectures from UEP alums and practitioners will provide valuable insight into the application of these varied topics to the real-world. We will learn mapping skills to understand the spatial context of these built environment challenges, as well as develop a proposal for a health impact assessment to evaluate the effects of a built environment policy or project. During the second half of the course, we will focus more specifically on active transportation topics, with particular attention to the needs of susceptible sub-populations such as the elderly, disabled, and children. We will review the scientific literature on active transportation, and cover topics related to design and planning, walkability, bikeability, safety, along with perceived and objective measures of the built environment. As part of the final design challenge project, students will develop and present a basic proposal to redesign a location of their choice for active transportation.

Upon completion of this course, students will have developed important analytical skills necessary to evaluate modern day public health and built environment challenges, including mapping tools, health impact assessments, and the basics of healthy planning and design. Furthermore, students will leave this course with a strong understanding of urban design features that promote or impede active transportation. In addition to the textbook readings, we will critique a wide range of articles drawn from the academic literature, and students will practice valuable literature review and project development skills. Students will also have the opportunity to self-design certain aspects of the course to focus specifically on real-world applications relevant to their own interests.

Prerequisites
This is a graduate level course, but upper level undergraduates may take this course with instructor permission. Some of the assigned readings will be quantitative in nature, so a basic knowledge of introductory statistics is strongly suggested (UEP 254/PH 205 or equivalent).
Knowledge of ArcGIS is also a plus but not required. The mapping tools discussed in class and applied in the weekly tasks will focus largely on accessible web-based tools for understanding the spatial context of public health and the built environment. The use of ArcGIS to complete the weekly tasks and design challenge is encouraged for students that possess the relevant software skills but not required.

**Textbook and Required Readings**

Environmental Health: From Global to Local, 3rd edition (2016), by Howard Frumkin is the required textbook for this course. A copy of this textbook is on reserve in the student lounge at the White House, and is also available for purchase on Amazon (~$80). This textbook was chosen because it provides a broad overview of the topics covered in this course as well as many other public health topics relevant to policy and planning practitioners. Additional non-textbook required readings will be drawn from the academic and practitioner literature, and have been chosen to represent a well-rounded view of each week’s topics. All readings and additional course material will be made available on the Trunk course site.

The course reading expectations are two readings (as either textbook chapters and/or journal articles) per one hour and 15 minute class period. An optional reading list is provided in the detailed outline for students interested in learning more about a given topic outside the context of the course requirements.

**Class participation**

The class format will be discussion-based and it is essential that you come to class prepared and willing to actively participate. All students are expected to do the required readings posted each week. Please let me know in advance if you will not be able to attend class.

**Student Assessment and Grading Policy**

<table>
<thead>
<tr>
<th>Graded Component</th>
<th>Score Allotted</th>
<th>Score Description</th>
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<tbody>
<tr>
<td>Homework tasks</td>
<td>50%</td>
<td>5% for each of 10 tasks</td>
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<tr>
<td>HIA Project</td>
<td>25%</td>
<td>5% draft</td>
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<td>15% final</td>
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<td>Design Challenge</td>
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**Homework Tasks**

A series of written tasks will be posted online roughly each week that require students to apply a topic covered in class to a real-world setting. Although some of these tasks will be written responses to topic-specific questions, others are intended to bring you out into your neighborhood to explore the public health challenges and opportunities of the built environment around you. These tasks will require you to think about the built environment from multiple perspectives, such as from the viewpoint of a child, disabled, or elderly person. In some cases, the task will consist of a diary of observations, and in others you will collect basic data on built environment infrastructure (or lack thereof) or groundtruth existing data. A grading rubric will be posted to help guide your weekly task assignments.
Students are responsible for posting their homework tasks to the discussion thread on Trunk by the start of class on due dates noted on the course outline. All peer responses must be posted online by the start of the next class (i.e., if a task is due on a Tuesday, peer responses should be posted by class time on Thursday of that same week).

Under no circumstances should excerpts or passages submitted for the homework tasks be exact duplicates of material derived from another source. This is plagiarism when not properly cited. It is ok to paraphrase and quote from passages retrieved from other sources, but it is not ok to use this information directly without proper citation, even for small homework tasks. Please review the Tufts Academic Integrity Policy online for more details about university policy.

Health Impact Assessment Proposal
During the first half of the semester, students will develop a proposal for a health impact assessment (HIA). The HIA project is intended to provide you a broad understanding of the HIA process as it relates to a specific area or application of interest to you. The three parts of the HIA proposal project are as follows:

   **Introduction:** Introduce your topic. Describe a policy or project where you believe a health impact assessment might be informative and useful. Provide the underlying rationale for your proposal choice and describe why this issue or project is important (approximately 1 double-spaced page).

   **Background:** Describe the science. Explore the scientific literature surrounding your topic, including the results of similar HIAs. Write a short literature review (properly cited) that provides the context and background for your policy question or project (approximately 5 double-spaced pages).

   **Methods:** Describe the process. Outline an approach to develop and execute an HIA for your chosen policy or project question, which is essentially a Methods section outlining your strategy for doing this work. The approach should provide detail on every step of the health impact assessment process (approximately 5 double-spaced pages).

Design Challenge
During the latter half of the course, students will participate in a Design Challenge to propose active transportation infrastructure in a location of their choice. Specific details related to the output of the design challenge will be provided mid-semester. Briefly, students will be required to produce a written product that clearly identifies, articulates, and documents the need for active transportation in their chosen location. Projects will apply the tools and information from the class readings, discussions, and tasks to replicate an existing design from the literature to their location that meets the needs of the population of users. Students will identify the public health benefits and costs, as well as the scale and feasibility of such a project in that location. Students interested in receiving optional feedback on the final written product must submit their drafts by the due date noted on the course outline.

In addition to the written document, students will present their ideas to the class in a 10 minute Power Point presentation. After the presentations, students will evaluate the designs of their
fellow classmates and provide written feedback on the public health benefits, feasibility, creativity, and likely success of each proposed active transportation project.

**Students with Disabilities**
Students with disabilities are assured that the Student Accessibility Services (SAS) office will work with each student individually to create access to all aspects of student life. Tufts is committed to providing equal access and support to all qualified students through the provision of reasonable accommodations so that each student may fully participate in the Tufts experience. If you have a disability that requires reasonable accommodations, please contact the Student Accessibility Services office at accessibility@tufts.edu or 617-627-4539 to make an appointment with an SAS representative to determine appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

**Preferred Pronouns**
You can now make a note of your preferred name on SIS, although there is currently no similar process available on Trunk. If you have any specific pronoun preferences, please let me know on the first day of class. My personal preferred pronouns are ‘she, her, and hers.’

**Plagiarism**
This course follows university policy with respect to plagiarism, which will not be tolerated. Proper citation of material derived from other sources is essential to academic integrity, and under no circumstances should students pull material directly from other sources without proper citation. In other words, cutting and pasting is never appropriate without the use of quotations and proper citation. This is plagiarism. It is ok to paraphrase and quote from passages retrieved from other sources, but it is not ok to use this information directly without proper citation, even for small homework tasks. Please review the Tufts Academic Integrity Policy online for more details about university policy.

**Citation Style**
All students should use the APA citation style to reference their written work submitted for this class, including in-text citations and end reference lists for the homework tasks, HIA mini-project, and Design Challenge. Detail on appropriate referencing using the APA citation style is readily available online.
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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assignment Due</th>
<th>Required Readings</th>
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<tbody>
<tr>
<td>Jan. 19</td>
<td>Introduction to Public Health and Built Environment</td>
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<td>Frumkin Chapter 1 and 15</td>
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<td>Jan. 24</td>
<td>Science, Risk, and Methods</td>
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<td>Frumkin Chapter 4 and 6 Schmidt 2013</td>
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<td>Jan. 26</td>
<td>Science, Risk, and Methods contd.</td>
<td>Task #1</td>
<td>Research and data (handout)</td>
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<td>Jan. 31</td>
<td>Health Impact Assessment</td>
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<td>APA 2016</td>
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<td>Dannenberg et al. 2008</td>
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<td>HIP 2011</td>
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<td>Mueller et al. 2017</td>
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<td>Feb. 2</td>
<td>Health Impact Assessment contd.</td>
<td>Task #2</td>
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<td>Feb. 7</td>
<td>Benefits of Nature Contact</td>
<td>Task #3</td>
<td>Frumkin Chapter 9 and 25</td>
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<td>Feb. 9</td>
<td>Benefits of Nature Contact contd.</td>
<td>HIA Intro draft</td>
<td>Mitchell and Popham 2008</td>
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<td>Feb. 14</td>
<td>Noise Pollution</td>
<td>Task #4</td>
<td>Hammer et al. 2014</td>
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<td>Feb. 16</td>
<td>GIS/Mapping Tools: Part I</td>
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<td>Frumkin Chapter 5</td>
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<td>Guest speaker Kevin Lane, post-doctoral researcher at BU and UEP alum</td>
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<td>Seltenrich 2014</td>
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<td>Feb. 21</td>
<td>GIS/Mapping Tools: Part II</td>
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<td>Guest tutorial on Policy Map and Social Explorer by Tufts librarian Josh Quan</td>
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<td>Feb. 23</td>
<td>NO CLASS – Monday schedule</td>
<td>HIA Lit Review draft</td>
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<td>Feb. 28</td>
<td>NO CLASS – Professor away</td>
<td>Task #5</td>
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<tr>
<td>March 2</td>
<td>Water Pollution</td>
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<td>Frumkin Chapter 16</td>
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<td>One additional reading TBD</td>
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<td>March 7</td>
<td>Food Systems</td>
<td>HIA Process draft</td>
<td>Frumkin Chapter 19</td>
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<td>Caspi et al. 2012</td>
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<td>Larson et al. 2009</td>
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<td>Saelens et al. 2012</td>
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<td>Food Systems contd.</td>
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<td>March 14</td>
<td>Air Pollution</td>
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<td>March 16</td>
<td>Air Pollution contd.</td>
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<td>Trasande et al. 2016</td>
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<td>One additional readings TBD</td>
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<td>Spring Break</td>
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<td>HIA project final due Tuesday 3/21</td>
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<td>March 28</td>
<td>Introduction to Active Transportation</td>
<td>Task #7</td>
<td>Brownson et al. 2005, Ewing and Cervero 2010, Zhang 2004, TBD</td>
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<td>March 30</td>
<td>Introduction to Active Transportation contd.</td>
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<td>April 6</td>
<td>Walking and Walkability contd.</td>
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<td>Guest speaker Stacey Beuttell, Program Director for WalkBoston</td>
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<td>April 11</td>
<td>Biking and Bikeability</td>
<td>Task #9</td>
<td>de Hartog et al. 2010, Pucher and Buehler 2008, Reynolds et al. 2009, Zuurbier et al. 2010</td>
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<td>April 13</td>
<td>Biking and Bikeability contd.</td>
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<td>April 18</td>
<td>Design for Active Transportation</td>
<td>Task #10</td>
<td>Schlossberg et al. 2013, AARP 2009 (Chapter 4)</td>
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<td>Guest speaker Mark Chase, UEP lecturer and alum</td>
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<td>April 20</td>
<td>Design for Active Transportation contd.</td>
<td>Design Challenge draft optional</td>
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<td>April 25</td>
<td>Climate Change</td>
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<td>Frumkin Chapter 12, Lake et al. 2012, Stone et al. 2010, Younger et al. 2008</td>
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<td>April 27</td>
<td>Climate Change contd.</td>
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<tr>
<td>May 2 or 4, 9-noon</td>
<td>Design Challenge Presentations</td>
<td>Design Challenge final</td>
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**Detailed Course Outline (all non-textbook required readings available on Trunk)**

**Introduction to Public Health and the Built Environment**
In this class we will review the syllabus and course expectations, and provide a brief introduction to the topics that will be covered in this course. We will lay the foundation for understanding public health challenges related to the built environment, including a discussion of trends in inactivity across the U.S. population and globally.

**Required Readings**
Frumkin H. 2016. Textbook Chapters 1 and 15.

**Additional Readings**
Frumkin H. 2016. Textbook Chapters 2 and 3.


**Science, Risk, and Methods**
In this class, we will lay the groundwork for the basic concepts of epidemiology, exposure assessment, and biostatistics critical to understanding and evaluating the research papers discussed in this class. We will also explore particular data and design challenges related to studies of the built environment, and will briefly discuss the role of epigenetics in understanding environmental health hazards.

**Required Readings**


Issues Related to Research Design and Data (posted handout)
**Additional Readings**

**Health Impact Assessment**
In this class we will discuss the goals of health impact assessment, and the general methodology and rationale for conducting such applied analyses in practice. We will review existing HIAs, and discuss how to develop and plan these efforts for the purposes of the midterm class project.

**Required Readings**


**Additional readings**

**Benefits of Nature Contact**
The week’s required readings consist of two journal articles and two textbook chapters that summarize the literature supporting the health benefits of human contact with nature. We will explore the environmental psychology literature, and provide an overview of the public health implications of access to nature and green space on mental and physical health, as well as attention and focus. We will identify the physiological and emotional basis for these health benefits, and understand how they impact health inequalities.

**Required Readings**


**Additional Readings**


**Noise Pollution**

During this guest lecture, we will explore noise as an environmental health hazard, and the impact the built environment has on generating or mitigating these hazards.

*Required Readings*


*Additional Readings*


**GIS/Mapping Tools and Gene-Environment Interactions**

In this class we will review basic online mapping tools for understanding the built environment, including Policy Map and Social Explorer. Students will be provided with a tutorial and handout that will allow them to access these tools for use in their homework tasks and class project. Students are encouraged to substitute GIS software if they possess the relevant skill set. In the second part of this class, we will discuss the growing literature on the relationship between genetics and the environment, and explore how genetic differences within a population make some individuals more susceptible than others to built environment risk factors.

*Required Readings*


Additional Readings

Water Pollution
This lecture was added in response to student interest in the topic of water pollution and the built environment. The required reading for the day broadly explores the topic of water quality and public health, but the focus of this lecture may adapt somewhat to meet student interests.

Required readings

One additional required reading TBD

Food Systems
During this week, we will explore built environment challenges related to food systems, including access to healthy food, perceived vs objective measures of access, and environmental justice concerns related to food desserts.

Required Readings


Additional Readings


Air Pollution
During this week, we will explore the relationship between transportation and mobile source-related air and noise pollution on human health. We will discuss the wide range of health outcomes attributed to transportation-related pollution, with a particular focus on susceptible sub-populations.

Required Readings


One additional required reading TBD

Additional Readings


Introduction to Active Transportation
The required readings explore built environment features that encourage or impede active transportation. We will identify the strength of the evidence supporting various design features, as well as how these variables are identified and measured in the scientific literature. This background material will allow us to develop and explore walking and biking as separate modes of transportation in the subsequent lectures.
**Required Readings**


**Additional Required Reading TBD**

**Additional Readings**


Walking and Walkability
We will build upon the previous readings and lectures to focus explicitly on walking and measures of ‘walkability’. We will explore built environment features and land uses relevant to walking, and identify how they are captured and measured in the current literature. We will explore the costs and benefits of walking as a form of active transportation, and its relationship to other modes of transportation as well as air quality.

Required Readings


Biking and Bikeability
We will build upon the previous readings and lectures to focus explicitly on biking and measures of ‘bikeability’. We will explore built environment features and land uses relevant to biking, and identify how they are captured and measured in the current literature. We will explore the costs and benefits of walking as a form of active transportation, and focus specifically on safety and infrastructure challenges as they relate to increasing the bike modeshare.

Required Readings


Additional Readings


Design for Active Transportation

In the guest lecture by Mark Chase, we will review the principles of design for active transportation. We will follow up during the second lecture with design-related topics for susceptible sub-populations.
Required Readings


Additional Readings


Climate Change
During this week we will look at how global warming and climate variability impacts public health through changes to the built environment, including food security, heat, extreme weather events, etc., with a specific focus on vulnerable urban populations.

Required Readings


Additional Readings