UP 430/CEE 417: Urban Transportation Planning
Department of Urban and Regional Planning
Department of Civil and Environmental Engineering
University of Illinois at Urbana-Champaign
Fall 2020

Instructor: Dr. Lindsay Braun
lmbran@illinois.edu

Office Hours: Thursdays by appointment; please sign up at https://calendly.com/lmbraun/meeting

Course Sessions: Mondays and Wednesdays 10:30–11:50 AM

Teaching Assistant: Abhinand Krishnashankar, ak43@illinois.edu

TA Office Hours: Wednesdays 12:00–1:00 PM by appointment

Credit Hours: 4.00

Course Description

UP 430/CEE 417 provides a broad overview of urban transportation planning in the United States, including historic and emerging issues faced in the field and the tools that are available to address these challenges. The course is designed for students who intend to specialize in transportation planning or engineering, as well as for those who would like an introduction to the field. The course content is divided into 12 learning modules that cover the following major topics:

- **Context, History, and Foundational Concepts** (Modules 1–3). The first section of the course describes the context of urban transportation planning in the United States, including travel patterns and trends; major phases and developments in transportation history; and key challenges that transportation planners and engineers currently face. This section also introduces concepts that are foundational to a thorough understanding of transportation planning, including the distinction between mobility and accessibility and the relationship between transportation and land use.

- **Institutions and Key Impacts** (Modules 4–8). The second section of the course outlines the institutional structure of transportation planning in the United States. This section describes the transportation planning process; introduces key decision makers and legislation at the federal, state, and regional levels; and considers past, present, and future mechanisms for financing transportation investments. Additionally, this section explores several impacts of the transportation system, including air quality, greenhouse gas emissions, safety and security, public health, and environmental justice and equity.

- **Standards and Methods** (Modules 9–11). The third section of the course introduces technical methods that planners and engineers commonly use to evaluate and plan for urban transportation systems. In particular, this section focuses on standards and practices related to parking, traffic
impact analysis, street design, and travel demand modeling. These topics provide a strong skill basis for students interested in pursuing careers in transportation, in both the public and private sectors.

- **The Future** (Module 12). The final section of the course explores the future of transportation planning with a particular emphasis on connected and autonomous vehicles (CAVs). This section will examine CAV technology and regulations; key opportunities (benefits) and challenges (risks) associated with CAV development; and strategic paths forward for the transportation planning field.

**Course Objectives**

UP 430/CEE 417 is designed to establish a fundamental knowledge base for understanding and analyzing urban transportation systems. By the end of the semester, students will be able to:

- Explain the history and context of transportation planning in the United States
- Summarize travel patterns and trends in meaningful ways
- Interact with major secondary data sources in the transportation planning field
- Describe foundational concepts (e.g., transportation-land use connection, distinction between mobility and accessibility) and understand the implications of these concepts for policy and practice
- Recognize key decision makers and regulatory frameworks in the transportation planning process
- Understand how transportation investments are funded, the limitations of current finance structures, and potential alternatives to address these limitations
- Identify and describe key impacts of the transportation system (e.g., environment, health, safety, equity)
- Assess the effectiveness of MPO plans in addressing transportation impacts
- Understand the evolution and policy implications of parking and street design standards
- Describe and critique methods used to analyze urban transportation systems
- Summarize the challenges and opportunities associated with connected and autonomous vehicles
- Engage in meaningful dialogue about key policy issues and current events in transportation planning

**Course Format**

This course will be taught mostly online, with the possibility of two to three in-person, outdoor sessions if weather and public health conditions allow. Dates for these tentative in-person sessions are indicated in the course schedule (page 6). In-person participation for these outdoor sessions will be optional, and alternative participation options will be provided for students who need or prefer to remain online. All other course sessions and activities will be conducted remotely through a combination of Zoom and Compass.

Lectures will be held synchronously via Zoom during the scheduled class time. Synchronous participation is strongly encouraged if at all possible. I understand, however, that some of you may face barriers to synchronous participation (e.g., different time zone, family care obligations, limited internet bandwidth). To accommodate students who cannot participate during the scheduled class time—either on a regular basis or for particular sessions (e.g., due to illness)—recordings of all lectures will be posted on Compass.

The synchronous sessions of the course will be interactive and taught through a combination of lectures and in-class activities (e.g., labs, discussions, debates). Additional opportunities for learning and engagement will come through group assignments and a class discussion board. Students are expected and encouraged to actively engage in these activities, contributing their questions, ideas, and experiences to a rich discussion and application of the course content.
Course Requirements

Engagement. Active engagement with the course materials, with the instructor, and with other students in the class is essential for success in UP 430/CEE 417. Given the unique and mostly-online format of this course, engagement can be demonstrated in multiple ways. The bulk of the engagement grade will come from the class discussion board, in which students will react to discussion questions and to each other's comments at the conclusion of each learning module (specific instructions to follow separately). Additionally, students are expected to complete the assigned readings prior to class and to come to lectures and the discussion board prepared for thoughtful participation. Synchronous lectures will be interactive and students will be expected and encouraged to engage in active dialogue about key concepts and real-world examples. For students who must participate asynchronously, engagement can be demonstrated not only through participation in the discussion board, but through proactive communication with the instructor, TA, and classmates as needed.

Assignments. Students will complete three assignments that require the use of analytical methods common in transportation planning. Two assignments will be completed in small groups assigned by the instructor; peer evaluations of individual contributions will form part of the grade for these assignments. One assignment will be completed individually; discussion among students about this assignment is allowed (and encouraged), but each student must turn in their own work. The assignments will cover the following topics/techniques:

- Assignment 1 (group): Travel Data Analysis
- Assignment 2 (individual): MPO Plan Evaluation
- Assignment 3 (group): Street Redesign Project

Note that graduate students will serve as group leaders for Assignments 1 and 3, and the specific requirements for Assignment 2 will differ for undergraduate and graduate students.

Labs. Students will complete seven labs during the course of the semester. For students who are able to participate in the synchronous sessions, these labs will be completed in small breakout groups during class. For students who are unable to participate synchronously on lab days, work may be completed either individually or in self-arranged small groups outside of class. Students will upload their completed lab documents to Compass on the Friday following the lab session for a basic check of completion and understanding.

Final Exam. A synthetic final exam covering lecture materials and course readings will be held online during the official University final exam period. The University policy on deferred, missed, and make-up exams will be followed (please see http://studentcode.illinois.edu/article3/part2/3-201/ and note key differences for undergraduate and graduate students).

Grading

Weights. Course requirements will be weighted in the final grade as follows:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Weight (%)</th>
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<tbody>
<tr>
<td>Engagement</td>
<td>15</td>
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<tr>
<td>Assignment 1 (group): Travel Data Analysis</td>
<td>15</td>
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<tr>
<td>Assignment 2 (individual): MPO Plan Evaluation</td>
<td>15</td>
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<tr>
<td>Assignment 3 (group): Street Redesign Project</td>
<td>20</td>
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<tr>
<td>Labs</td>
<td>15</td>
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<tr>
<td>Final Exam</td>
<td>20</td>
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<tr>
<td>Total</td>
<td>100%</td>
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Grading Scale. Numeric grades will be converted into letter grades using the scale outlined below. The course will not be graded on a curve, and there will be no rounding applied to numeric grades.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
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<tbody>
<tr>
<td>A</td>
<td>94.0–100</td>
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<tr>
<td>A-</td>
<td>90.0–93.99</td>
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<tr>
<td>B</td>
<td>80.0–83.99</td>
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<tr>
<td>B+</td>
<td>87.0–89.99</td>
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<tr>
<td>B-</td>
<td>74.0–76.99</td>
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<tr>
<td>C</td>
<td>70.0–73.99</td>
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<tr>
<td>C+</td>
<td>67.0–69.99</td>
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<tr>
<td>C-</td>
<td>64.0–66.99</td>
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<tr>
<td>D</td>
<td>60.0–63.99</td>
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<tr>
<td>D+</td>
<td>67.0–69.99</td>
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<tr>
<td>D-</td>
<td>Less than 60.0</td>
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</table>

Detailed instructions for completing each assignment will be provided. Submitted assignments will be graded and returned promptly with detailed feedback. The general grading rubric is as follows:

- An “A” assignment demonstrates original thought and synthesis of ideas and sophisticated, cogent analysis. It is clearly written and presented. Outstanding work.
- A “B” assignment includes above average analysis with appropriate evidence to support ideas. It is clearly written and presented. Good work.
- A “C” assignment shows a basic level of understanding, with analysis limited to obvious arguments. Writing is competent. Developing but adequate work.
- A “D” assignment misunderstands or misrepresents the material, or is so poorly written or presented as to obscure the analysis. Inadequate work.

Late Assignments. Students are expected to turn in all deliverables (assignments, labs, discussion board posts) on time. However, I understand—now more than ever—that challenges, unanticipated obligations, and illnesses will arise. If you are unable to meet a particular deadline, it is your responsibility to make prior arrangements with the instructor for that given deliverable. Otherwise, work submitted past the deadline will receive a five-percentage-point deduction, and work submitted later than five days past the deadline will not be considered for grading unless consent has been given by the instructor. Please communicate with me proactively about any challenges, illnesses, or emergencies that arise—I am here to work with you and help you do your best!

Readings

There is no required text for this course. All readings will be posted on Compass and/or available through the University of Illinois library. Readings for each session are listed at the conclusion of this syllabus.

Course Policies and Other Items/Resources

Attendance. “Attendance,” defined this semester as active engagement with the course material and activities, is necessary for adequate performance in this course. It is the instructor’s decision as to when a student’s “absences” (e.g., missed deadlines, non-participation in discussion board, lack of engagement), without proactive communication with the instructor, become excessive and should be reported. If in the opinion of an instructor the attendance of a student becomes so irregular that their scholarship is likely to be impaired, the instructor may submit an irregular attendance form to the Associate Dean of the student’s college. A copy is forwarded to the student, who should contact the instructor immediately to work out a solution. If irregular attendance continues without excuse, the instructor may request the student be withdrawn from the course. This request for withdrawal would result in a grade of E for the course. Extenuating circumstances will always be considered when supporting evidence is presented. See Rule 1-501 and Rule 1-502 in the Student Code for more information.
**Academic Accommodations.** This course will accommodate students with documented disabilities. To obtain disability-related academic adjustments and/or auxiliary aids, students should contact both the instructor and the Disability Resources and Educational Services (DRES) as soon as possible. You can contact DRES at 1207 S. Oak Street, Champaign, by phone at (217) 333-1970, or via email at disability@illinois.edu.

**Academic Integrity.** This course follows the guidelines set forth by the University Student Code. See [http://www.admin.uiuc.edu/policy/code/article_1/a1_1-401.html](http://www.admin.uiuc.edu/policy/code/article_1/a1_1-401.html) for specific guidelines, examples, and punishment associated with academic dishonesty. In written work, any ideas that are not your own must be properly cited. The consequences for plagiarism may include receiving no credit for an assignment or, at the discretion of the instructor, failure of the course.

**Counseling.** The University Counseling Center is committed to providing a range of services intended to help students develop improved coping skills in order to address emotional, interpersonal, and academic concerns. The Counseling Center provides individual, couples, and group counseling. All of these services are paid for through the health services fee. The Counseling Center offers primarily short term counseling, but they do also provide referrals to the community when students could benefit from longer term services. [https://counselingcenter.illinois.edu/](https://counselingcenter.illinois.edu/).

**Class Climate.** The Department of Urban and Regional Planning (DURP) is committed to maintaining a learning environment that is rooted in the goals and responsibilities of professional planners. By enrolling in a class offered by the Department of Urban and Regional Planning, students agree to be responsible for maintaining an atmosphere of mutual respect in all DURP activities, including lectures, discussions, labs, projects, and extracurricular programs. See Student Code Article 1-Student Rights and Responsibilities, Part 1. Student Rights: §1-102.

**Netiquette.** In any social interaction, certain rules of etiquette are expected and contribute to more enjoyable and productive communication. The following are tips for interacting online via email or discussion board messages, adapted from guidelines originally compiled by Chuq Von Rospach and Gene Spafford (1995):

- Remember that the person receiving your message is someone like you, deserving and appreciating courtesy and respect.
- Be brief; succinct, thoughtful messages have the greatest effect.
- Your messages reflect on you personally; take time to make sure that you are proud of their form and content.
- Use descriptive subject headings in your emails.
- Think about your audience and the relevance of your messages.
- Be careful when you use humor and sarcasm; absent the voice inflections and body language that aid face-to-face communication, internet messages are easy to misinterpret.
- When making follow-up comments, summarize the parts of the message to which you are responding.
- Avoid repeating what has already been said; needless repetition is ineffective communication.
- Cite appropriate references whenever using someone else's ideas, thoughts, or words.
<table>
<thead>
<tr>
<th>Module</th>
<th>Date</th>
<th>Topic</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Aug 24</td>
<td>Course Overview and Major Themes</td>
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<tr>
<td>1</td>
<td>Aug 26</td>
<td>Transportation Data 1: Travel Patterns and Trends</td>
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<td></td>
<td>Aug 31</td>
<td>Transportation Data 2: Sources and Methods</td>
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<td></td>
<td>Sep 2</td>
<td>Transportation Data 3: NHTS Application Exercise</td>
<td>Lab 1</td>
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<td></td>
<td>Sep 7</td>
<td>NO CLASS – Labor Day</td>
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<tr>
<td>2</td>
<td>Sep 9</td>
<td>Transportation History 1: Walking City + Transit</td>
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<td>Sep 14</td>
<td>Transportation History 2: Rise of the Automobile</td>
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<td>3</td>
<td>Sep 16</td>
<td>Transportation and Land Use 1: T → LU</td>
<td>Lab 2*</td>
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<td>Sep 21</td>
<td>Transportation and Land Use 2: LU → T</td>
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<td></td>
<td>Sep 23</td>
<td>Transportation and Land Use 3: Measuring Walkability</td>
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<td>Section II: Institutions and Key Impacts</td>
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<td>4</td>
<td>Sep 28</td>
<td>Transportation Planning Process 1: Federal Role</td>
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<td>5</td>
<td>Sep 30</td>
<td>Transportation Planning Process 2: MPOs and States</td>
<td>A1 Due (Friday)</td>
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<td></td>
<td>Oct 5</td>
<td>Transportation Finance 1: Current Status</td>
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<td></td>
<td>Oct 7</td>
<td>Transportation Finance 2: Future Alternatives</td>
<td>Lab 3*</td>
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<td>Oct 12</td>
<td>Environmental Impacts 1: NEPA and Air Quality</td>
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<td>6</td>
<td>Oct 14</td>
<td>Environmental Impacts 2: Greenhouse Gas Emissions</td>
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<td>7</td>
<td>Oct 19</td>
<td>Congestion: A Problem or a Solution?</td>
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<td></td>
<td>Oct 21</td>
<td>Equity, EJ, and Travel of Disadvantaged Groups</td>
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<td>8</td>
<td>Oct 26</td>
<td>Transportation Safety and Security</td>
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<td>Oct 28</td>
<td>Public Health: Benefits, Risks, and Tradeoffs</td>
<td>Lab 4*; A2 Due (Friday)</td>
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<td>Section III: Standards and Methods</td>
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<td>9</td>
<td>Nov 2</td>
<td>Street Design: Traditional Standards</td>
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<td>Nov 4</td>
<td>Street Design: New Approaches</td>
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<td>10</td>
<td>Nov 9</td>
<td>Street Design: New Approaches (continued) and Visualization</td>
<td>Lab 5</td>
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<td>Nov 11</td>
<td>Planning for Parking</td>
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<td>Nov 16</td>
<td>Traffic Impact Analysis</td>
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<td>Nov 18</td>
<td>ITE Standards: Application Exercise</td>
<td>Lab 6</td>
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<td></td>
<td>Nov 23</td>
<td>NO CLASS – Fall Break</td>
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<td>11</td>
<td>Nov 25</td>
<td>NO CLASS – Fall Break</td>
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<td></td>
<td>Nov 30</td>
<td>Transportation Modeling 1: Standard Practices</td>
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<td></td>
<td>Dec 2</td>
<td>Transportation Modeling 2: Critiques and Alternatives</td>
<td>A3 Due (Friday)</td>
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<td>Section IV: The Future</td>
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<td>12</td>
<td>Dec 7</td>
<td>Autonomous Vehicles 1: Overview, Opportunities, Challenges</td>
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<td></td>
<td>Dec 9</td>
<td>Autonomous Vehicles 2: Paths Forward</td>
<td>Lab 7</td>
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<td></td>
<td>Dec 14</td>
<td>Final Exam (8:00 AM on Monday)</td>
<td>Final Exam</td>
</tr>
</tbody>
</table>

Subject to revision; * denotes sessions that may be held in person (outdoors), if weather and public health conditions allow.
Readings

Introduction

Course Overview and Major Themes (8/24)

Module 1: Transportation Data

Travel Patterns and Trends (8/26)
- Choose one of the following:

Data Sources and Methods (8/31)

NHTS Application Exercise (9/2)
- No readings required

Module 2: Transportation History

Walking City and the Rise and Fall of Transit (9/9)

Rise of the Automobile (9/14)
Module 3: Transportation and Land Use

Transportation → Land Use (9/16)

Land Use → Transportation (9/21)

Measuring Walkability (9/23)
- Walkability audit tools assigned as part of Lab 2

Module 4: Transportation Planning Process

The Federal Role (9/28)

Metropolitan Planning Organizations (MPOs) and States (9/30)
Module 5: Transportation Finance

Current Status (10/5)


Future Alternatives (10/7)


Module 6: Environmental Impacts

NEPA Process and Air Quality Conformity (10/12)


Greenhouse Gas Emissions (10/14)


Module 7: Congestion and Equity

Congestion: A Problem or a Solution? (10/19)


Equity, EJ, and Travel of Disadvantaged Groups (10/21)


**Module 8: Safety and Health**

**Transportation Safety and Security (10/26)**


**Public Health: Benefits, Risks, and Tradeoffs (10/28)**


**Module 9: Street Design**

**Traditional Standards (11/2)**


**New Approaches (11/4)**


**New Approaches (continued) and Visualization (11/9)**


**Module 10: Parking and Traffic Impact Analysis**

**Planning for Parking (11/11)**


Traffic Impact Analysis (11/16)
• Institute of Transportation Engineers. (2006). “Transportation Impact Analyses for Site Development.”

ITE Standards: Application Exercise (11/18)

Module 1: Transportation Modeling

Standard Practices (11/30)

Critiques and Alternatives (12/2)

Module 12: Autonomous Vehicles

Overview, Opportunities, and Challenges (12/7)

Paths Forward (12/9)
• Links to policy statements on autonomous vehicles:
  o [Human Factors and Ergonomics Society](https://www.hfes.org) (HFES)
- National Association of City Transportation Officials (NACTO)
- Institute of Transportation Engineers (ITE)
- Association of Pedestrian and Bicycle Professionals (APBP)
- California Multi-Agency Workgroup on AV Deployment for Healthy and Sustainable Communities