Course Description

This course focuses on the interaction between land use and transportation along multiple scales, ranging from the metropolitan lens to the curbside one. The course aims to develop an understanding of relevant theories and analytical techniques, as well as a critical approach to contemporary challenges fostered by new technologies, through the exploration of various cases drawn from different parts of the world.

During the first module of the course, students will develop a basic understanding of the indissociable relation between transportation and land use.

The second module will introduce the major forces, patterns and trends linking transportation and land use, including metropolitan growth and governance, suburbanization, accessibility, environmental, social and health impacts policies and design.

Building on these foundations, in the third module, students will learn key concepts and analytical models to assess the relation between transportation and land use, including travel demand and travel behavior, and the influence of the built environment and urban form in transportation. Additionally, students will learn about two special topics: Transit Oriented Development (TOD) and high-speed rail boosting the urbanization of new Chinese towns.

The fourth module of the course turns to the exploration of how new technologies and scales might change the way we examine the relation between transportation and land use, including autonomous vehicles and curbside management.

Finally, in the fifth module students will present case studies addressing different topics discussed during the course, building on real cases in different contexts.

Learning Objectives

By the end of the course, students should have developed:

- An understanding of transportation and land use interaction theories, including issues related to accessibility, travel demand, urban structure, and location theory;
- An ability to interpret the influence of land use on travel behavior, accounting for potential variation in estimated effects due to the spatial scale of analysis, analytical approach, and data used;
- Skills for assessing urban form and design from the perspective of travel behavior;
- An understanding of the impacts of transportation infrastructure on land development;
- An ability to critically evaluate policies aimed to influence the transportation-land use interaction space;
- A knowledge of the various relevant policy instruments, institutional settings, and analytical tools.
- A critical approach to contemporary opportunities and challenges faced by planning authorities dealing with transportation planning and land use.

For students with the need/interest, special session(s) will be organized to give students a basic aptitude in understanding regression models; geographic information systems (GIS) and databases; and transportation levels of service measurement.

**Course Requirements**

The course meets once a week for lectures and class work and discussions. In addition to regular class sessions, the TA will occasionally conduct non-mandatory discussions. There are no formal prerequisites for the course; however, students should have some understanding of, and facility with, statistics. Students are expected to come to class having read the required readings for the week.

**Course Materials**

All of the course readings are listed on the syllabus below and are available online: https://learning-modules.mit.edu/class/index.html?uuid=/course/11/sp20/11.526#info.


Additional readings are also listed for your benefit; going over them is entirely optional. Please contact the TA if you have any problems with accessing the materials.

**Special Accommodations**

If you have a documented disability, or any other problem you think might affect your ability to perform in class, please see the instructor early in the semester so that arrangements may be made to accommodate you.

**Class exercises, Assignments and Grading**

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<thead>
<tr>
<th>Value</th>
<th>Posted</th>
<th>Due</th>
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<table>
<thead>
<tr>
<th>Assignment 1</th>
<th>10%</th>
<th>2/6</th>
<th>2/20</th>
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<tr>
<td>Land use and transportation in your neighborhood</td>
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| Class exercise 1 [pairs]                        | 5%  | 2/20  | 2/27  |
| Land use and transportation in your neighborhood |     |       |       |

| Assignment 2                                      | 10% | 2/27  | 3/5   |
| Accessibility in the metropolis                   |     |       |       |

| Class exercise 2 [pairs]                        | 5%  | 3/5   | 3/12  |
| Social, environmental and health impacts of land use-transportation link |     |       |       |

| Assignment 3 [pairs]                             | 15% | 3/12  | 4/2   |
| Shaping travel behavior by design                 |     |       |       |

| Class exercise 3 [pairs]                        | 5%  | 4/16  | 4/23  |
| Autonomous vehicles: policies and design         |     |       |       |

| Assignment 4: case studies                       | 15% | 4/2   | 4/30  |
| 5-minute presentation                            |     |       | + 5/7 |

| Final Assignment: Project Analysis                | 35% | 3/19  | 5/7   |
| Critical assessment of development plans          |     |       |       |

* When not otherwise marked, assignments are individual. Late submissions for all assignments will be penalized, except in cases of documented disabilities or arrangements with the instructor.

**Academic Integrity**

Plagiarism and cheating are not tolerated. Never (1) turn in an assignment that is not your own original work, or (2) turn in an assignment for this class that you previously turned in for another class. Anyone caught cheating on an assignment will be reported to the provost in line with recognized university procedures. This may result in a failing grade for the class, and possibly even suspension from MIT. Please see the instructor if you have any questions about what constitutes plagiarism, and visit the MIT policy on Academic Integrity: [http://web.mit.edu/academicintegrity/](http://web.mit.edu/academicintegrity/)

**Calendar**

<table>
<thead>
<tr>
<th>MODULE 1: INTRODUCTION TO LAND USE AND TRANSPORTATION PLANNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture 1: February 6</td>
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</tbody>
</table>

Course overview, objectives, expectations, logistics, student interests.
**Part 1:** Teaching and learning land use and transportation planning.

**Required Readings**

**Part 2:** Why comparative land use and transportation planning?

**Required Readings**

**Additional Readings**

**Assignment 1 Out:** Explore the land use-transportation interaction [your hometown, individual]

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## MODULE 2: FORCES, PATTERNS, TRENDS, CONCERNS

**Lecture 2:** February 13 [Christopher Zegras]

**Part 1:** Metropolitan-ization forces, patterns, trends, and concerns

**Required Readings**


** Part 2: Metropolitan governance

** Required Readings**


** Additional Readings**


** Lecture 3: February 20**

** Part 1: Parking**

** Required Readings**


** Additional Readings**


** Part 2: Class exercise 1: land use-transportation interaction [selected sites, in pairs]**

** Assignment 1 due**

** Lecture 4: February 27 [Christopher Zegras]**

** Part 1: Accessibility: Land use—transportation link**

** Required Readings**

Handy, S.L. & Clifton, K.J. (2001). Evaluating Neighborhood Accessibility: Possibilities and

**Part 2: Accessibility: Operationalization**

**Required Readings**

**Class Exercise 1 due**
**Assignment 2 out: Accessibility in the metropolis [individual]**

**Lecture 5: March 05**

**Part 1: Environmental impacts of land use and transportation choices**

**Required Readings**

**Additional Readings**
**Part 2: Transportation, land use, and health**

**Required Readings**

**Additional Readings**

**Assignment 2 due**

**Class exercise 2: Social, environmental and health impacts of land use-transportation link**

**Required Readings**

**Resources**
Accessibility Observatory: [http://access.umn.edu](http://access.umn.edu)
Transit Analyst: [https://transitanalyst.com/](https://transitanalyst.com/)
Travel Time Platform: [https://app.traveltimeplatform.com](https://app.traveltimeplatform.com)

**MODULE 3: KEY CONCEPTS AND ANALYTICAL TOOLS**

**Lecture 6: March 12 [Christopher Zegras]**

**Part 1: Travel Demand**

**Required Readings**
Part 2: Land Use and Travel Behavior

Required Readings

Additional Readings

** Class Exercise 2 due
** Assignment 3 out: Shaping travel behavior by design [pairs]

**Additional Readings**

**Part 2: High-speed rail and urbanization in China** [guest lecturer: Siqi Zheng]

**Required Readings**

**Additional Readings**

**Final Assignment out: Project Assessment** [individual]

**SPRING BREAK**: March 26

**Lecture 8: April 02**

**Part 1: Urban form: driver or response?**

**Required Readings**

**Part 2: Travel behavior and built environment: a matter of scale?**

**Required Readings**


**Additional Readings**


**Assignment 3 due**

**Assignment 4 out: case studies**

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**Lecture 9: April 09**

**Part 1: Big data and urban mobility**

**Required Readings**


**Additional Readings**


**Part 2: Digital platforms for transportation and land use planning**


Coax, MIT Mobility Futures Collaborative ([https://mfc.mit.edu/innovations-participatory-design-brt-systems](https://mfc.mit.edu/innovations-participatory-design-brt-systems))

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**MODULE 4: SHAPING THE FUTURE: TECHNOLOGIES AND SCALES**

**Lecture 10: April 16**
Part 1: Autonomous Vehicles: challenges and opportunities for land use and transportation

Required Readings

Additional Readings

Part 2: Class discussion: AV and urban design

Required Readings

Additional Readings

** Class exercise 3: Autonomous vehicles: policies and design [pairs]**

Lecture 11: April 23

Part 1: Curb management: multiple spatial and temporal scales of land use and transportation

Required Readings

**Part 2:** Case Study: RATP, Paris [guest lecturer, Arianna Salazar]

**Class Exercise 3 due**

### MODULE 5: CASE STUDIES / STUDENT PRESENTATION

<table>
<thead>
<tr>
<th>Lecture 12: April 30</th>
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<tbody>
<tr>
<td><strong>Part 1:</strong> Case Studies: technologies (Autonomous Vehicles, Speed Rail, Hyperloop)</td>
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<td><strong>Part 2:</strong> Case Studies: technologies (AV freight, drones and logistics)</td>
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<table>
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<tr>
<th>Lecture 13: May 07</th>
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<tr>
<td><strong>Part 1:</strong> Case Studies: transit (BRT, TOD)</td>
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<td><strong>Part 2:</strong> Case Studies: policies and financial instruments</td>
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**Final Assignment due**