

Syllabus

11.S03 First-Year Discovery Subject:

Transportation shaping sustainable urbanization: connections with behavior, urban economics and planning

This version: November 17, 2021

Units: 3 (2-0-1)

Subject can count toward the 9-unit discovery-focused credit limit for first-year students

Grading Type: P/D/F

Class meeting time and place: 11am-12:30pm Tuesdays and Thursdays; from March 28 until April 21 (H4)

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Course Description and Objectives

Notable characteristics of cities are correlated with their historical and current transportation features. Central areas of most European cities created during the pre-modern transportation era are more walkable, dense, and diverse. Auto-oriented North American suburbs sprawled during the massive increase in car ownership. This course introduces students to theoretical basis and empirical evidence to explore the changes in the built environment expected from transportation investments, and how they can be used to promote sustainable and equitable cities. Along the way, we will reflect on the urban transformation autonomous vehicles will bring and how shared mobility services are affecting travel behavior, and its implications from an urban planning perspective. Lectures will be interspersed with guest speakers and one field trip.

This 3 units P/NR course proposal was designed to meet the requirement for a First-Year Discovery (FYD) subject. Its main purpose is to introduce students to an urban studies approach to analyze transportation phenomena, putting first-year undergrad students in contact with DUSP faculty and the kind of data, methods and questions mobilized on their research. Students will also be exposed to a real transportation project and its local urban impacts. Transportation serves as one of the cross-cutting research/education areas in DUSP and there is no FYD subject to help undergrad students explore this topic in the department and from an urban planning approach.

Structure and Schedule

Class 1 | 29/3

- Topics: Introduction
Urban studies approach to analyze transportation phenomena
- Reading: Muller, P. O. (2004). Transportation and Urban Form - Stages in the Spatial Evolution of the American Metropolis. In S. Hanson (Ed.), *The Geography of Urban Transportation* (pp. 59–85). Guildford Press.

Class 2 | 31/3

- Topics: Urban economics theoretical framework
Transport costs and urban form
- Reading: Giuliano, G., & Agarwal, A. (2017). Land Use Impacts of Transportation Investments. In G. Giuliano & S. Hanson (Eds.), *The Geography of Urban Transportation* (Fourth edi).

Class 3 | 5/4

- Topics: Behavior science and transportation technology shaping travel behavior
- Guest Speaker: TBD
- Reading: McFadden, D. (2007). The behavioral science of transportation. *Transport policy*, 14(4), 269–274.

Class 4 | 7/4

- Topics: Transportation shaping cities in the US context and aspects of transit-oriented planning and governance
- Guest Speaker: TBD
- Reading: Zegras, C. (2017). Metropolitan Governance for Sustainable Mobility. In A. Gómez-Álvarez, R. Rajack, E. L. Moreno, & G. Lanfranchi (Eds.), *Steering the Metropolis: Metropolitan Governance for Sustainable Urban Development* (pp. 225–238). IDB.

Class 5 | 12/4

- Topics: Transportation and air quality in Chinese cities
- Guest Speaker: Prof. Siqi Zheng
Samuel Tak Lee Professor @ DUSP-MIT
Faculty Director, [Sustainable Urbanization Lab](#)
Faculty Director, [MIT Center for Real Estate](#)
- Reading: Zheng, S., Zhang, X., Sun, W., & Wang, J. (2019). The effect of a new subway line on local air quality: A case study in Changsha. *Transportation Research Part D: Transport and Environment*. 68: 26-38.

Class 6 | 14/4

- Topics: Transportation in Latin America and its impact on built environment
- Reading: Costa, A., Zegras, C, Biderman, C. Chasing the City that Cannot Stop: Exploring transportation and urban co-development in São Paulo's history

Class 7 | 19/4

Topics: Autonomous vehicles and new mobility technologies shaping future cities
Reading: Fábio Duarte & Carlo Ratti (2018) The Impact of Autonomous Vehicles on Cities: A Review, Journal of Urban Technology, 25:4, 3-18.

Class 8 | 21/4

Topics: Transportation shaping sustainable urbanization: establishing the connections
Analyzing a real transportation project and its local urban impacts
Reading: Green Line Extension Project Report

Grading

Students are expected to attend and participate in all classes, reading the corresponding materials for each class. Students that were not able to attend one or more classes will produce a reflection memo following guidelines provided by the instructors.