

PPD 422: Transportation Technology and the Future of Mobility Fall 2019

Location: VKC100

Time: Mondays, 6:00 – 9:20 pm

Instructor 1: Lilly Shoup

Office Hours: 1 hour prior to class by appointment

Contact Info: lshoup@usc.edu

Instructor 2: Julia Thayne

Office Hours: 1 hour prior to class by appointment

Contact Info: jthayne@usc.edu

Catalog Description

Introduction of the role that technology will play in facilitating shared mobility, disrupting transportation markets, and reshaping multi-modal urban transportation systems; analyses of governance issues; the interaction between private markets and regulators; changes in the nature of infrastructure and urban planning required to accommodate the wired future of transportation.

Course Summary

Technology is transforming mobility and cities. This course will introduce students to a distinctly urban view of the role that technology will play in facilitating shared mobility, disrupting transportation markets, and reshaping multimodal transportation systems. The class will include analyses of governance issues, the interaction between private providers and regulators, and changes in the planning, design, and operations of infrastructure and land use planning that will be required to facilitate a safe, equitable, and sustainable transportation system in the future.

At the end of this course, you should expect to have learned about transportation technology and the future of urban mobility from the multiple perspectives of the people responsible for implementing and shaping them:

- A policymaker anticipating and collaborating on transportation technology deployment
- A business designing and deploying a new urban mobility product or solution
- The public, who influence the transportation networks of today and tomorrow
- Other stakeholders, such as city planners and urban designers, real estate developers, non-profit organizations, or universities, who either have to respond to new mobility (and bear the consequences) or anticipate them (and try to influence their outcomes)

You should also expect to gain a limited technical understanding of the predominant products/solutions in transportation technology today, as well as demonstrate a critical understanding of the urban design, equity, accessibility, and sustainability implications of transportation technology in city environments.

Learning Objectives

At the end of the course you should expect to have the following skills:

1. Understand the technology innovations that are part of the ACES revolution
2. Evaluate the impacts of transportation technology policy frameworks on urban sustainability, equity, and accessibility
3. Present complex policies in a concise and compelling way to a range of audiences
4. Develop proofs-of-concept and pilots for implementing ACES in an urban context

Grading Breakdown

To receive an “A” grade, students must complete all work on time and submit work of superior quality throughout the course. Work must address all aspects of the required assignments, exceed the minimum requirements and demonstrate critical and creative thinking.

Students must consistently contribute to class discussion. In-class assignments will be evaluated based on the thoughtful completion of the assigned activity. Activities in class may include guest speaker discussions, debates, and presentations.

A – Work of excellent quality exceeding requirements and exceeding expectations

B – Work of good quality meeting requirements and meeting expectations

C – Work of fair quality

D – Work of minimum passing quality

F – Failure to adequately complete coursework.

Assignment	Percentage
In-Class Assignments	40%
Mid-term Exam (Multiple Choice)	10%
Final Exam (In-class Essay)	50%

Grading Scale

Course final grades will be determined using the following scale

A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59 and below

Overview of In-Class Assignments

Group Debates

In Weeks 4, 5, 12, and 13 of our course, we will have in-class debates on the following for/against topics.

- *Week 4:* LA Metro should build a Bus Rapid Transit (BRT) line along Colorado Boulevard in Eagle Rock.
- *Week 5:* LADOT should be able to set vehicle caps, collect data, require insurance, and take other policy/regulatory actions on deployment of scooters in the City of LA.
- *Week 12:* The City of LA should have parking minimums for developments being built in Downtown LA.
- *Week 13:* The City of Boston should have taken the bid to host the 2024 Olympics.

Each debate will feature two teams, with five students on each team. You will be assigned a team, a topic, and a date for your debate - information which will be posted on Blackboard following the first class.

Guest Speakers

In Weeks 4, 6, 8, 9, and 13 of the course, a guest speaker will present on the following topics:

- *Week 4:* Transportation Equity
- *Week 6:* Autonomous Vehicles
- *Week 8:* Zero Emissions Vehicles
- *Week 9:* Transportation-as-a-Service
- *Week 13:* LA2028 Olympics

Prior to each guest speaker's visit, you will be responsible for researching the speaker and the topics, as well as preparing and submitting three questions you would like to ask. Following the lecture, you will be responsible for submitting notes on what you learned and any remaining questions. These will be submitted via Blackboard by midnight of the night before the following class (e.g., for Week 4's assignment, on the Sunday night at midnight before Week 5's class) to be considered on time.

Group Presentations

In Weeks 7, 8, and 11, we will have group presentations on the following topics.

- 1) *Week 7:* CAV Policy
 - a) Federal regulation of CAVs in the U.S.
 - b) State and local regulations of CAVs in the U.S.
 - i) NV, Las Vegas
 - ii) FL, Tampa/Miami/Orlando
 - iii) CA, San Francisco/Bay Area
 - c) OUS policy for CAVs
- 2) *Week 8:* Zero-emissions vehicles and Sustainable Urban Transport
 - a) Types of and global market trends for zero-emissions freight and logistics vehicles
 - b) Types of and global market trends for zero-emissions passenger vehicles
 - c) U.S. federal regulations, incentives, and adoption for zero-emissions vehicles
 - d) EU regulations, incentives, and adoption of zero-emissions vehicles
 - e) Chinese regulations, incentives, and adoption of zero-emissions vehicles
- 3) *Week 11:* New Mobility and the Public-Private Partnership Paradigm

- a) Microtransit pilots in U.S. cities
- b) Overview of urban air mobility companies and projects
- c) Overview of curb management companies and projects
- d) Overview of mobility-as-a-service companies and projects
- e) Case studies of successful P3's in the U.S. and/or abroad

Each presentation will be prepared by groups of 2-3 students, and the topics and groups will be assigned following Week 1 of the course. The entire presentation should last 15-18 minutes, followed by 2-3 minutes of questions / discussion. You will be stopped after 20 minutes whether you are finished or not, so time your presentation well. You will NOT be allowed to read from notes or note cards during the presentation.

Class Policies

In-Class Assignments: A substantial portion of the grade for this class is from in-class assignments, submitted at the end of most classes. The lowest 2 in-class assignment scores will be dropped (use those wisely!). If you aren't present for the in-class work you won't earn credit for that day.

Late work: Late work will be accepted with a 25% penalty for one week after the assignment due date. Late work will not be accepted after one week and must be turned in before the last day of class.

Technology in Class: Electronic devices are allowed in class, but please use laptops and phones for learning purposes only. Your use can't be distracting to other students ability to learn and participate in class and students may be asked to leave.

Communication: We are here for you! Please feel free to email us at any point to ask a question, provide feedback, or arrange an office hours appointment. Please use an USC email address to make sure we see it and put the course number in the subject line. We will respond to your email within 48 hours.

Research Assistance: Need to do research but don't know where to start? Searching for a book, article, or data to support your argument? Not sure how to cite a source in your bibliography? Ask a librarian! Research help is available:

- In person and by phone, chat and email at Ask a Librarian
- Through research guides and FAQs
- By contacting your subject librarian

Religious Absences: University policy grants students excused absences from class for observance of religious holy days. However, you must contact us IN ADVANCE to request such an excused absence. You will be given an opportunity to make up missed work because of religious observance.

Students with Disabilities: Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Course Schedule: A Weekly Breakdown

This tentative schedule provides the topics, reading, and assignments for each class. It is expected that all readings are completed before class. Assignments are due at the start of class. Any changes to the schedule will be announced in class and noted on Blackboard.

	Topic	Readings and Homework	Deliverable
Week 1	Introduction to the Four Technology Forces of Transportation Innovation	<ul style="list-style-type: none"> Bouton, Shannon, et al. “The future of mobility: How cities can benefit.” <i>McKinsey</i>, 2017, 	

Theme 1. YESTERDAY: URBAN DEVELOPMENT AND TRANSPORTATION HISTORY

Week 2	Transportation Policy – The Future as it Looked in the Past	<ul style="list-style-type: none"> Morris, Eric. “From Horse Power to Horsepower” ACCESS number 30, 2007, University of California Transportation Center, pp. 2-9, Masters, Nathan. A Brief History of Bicycles in the Los Angeles Area. March 24, 2011 Listen or read: 99 Percent Invisible Podcast. The Great Red Car Conspiracy. Moynihan, Daniel P. “New Roads and Urban Chaos,” <i>The Reporter</i>, April 14, 1960. Shoup, Lilly, “Transportation 101” <i>Transportation for America</i>. 2011. pp. 14-22. 	
Week 3	Transportation Technology and the Geography of the Modern Metropolis	<ul style="list-style-type: none"> Jean-Paul Rodrigue (2017), The Geography of Transport Systems. New York: Routledge. Chapter 1. Baum-Snow, Nathaniel. (2007), “Did Highways Cause Suburbanization?” <i>Quarterly Journal of Economics</i>, 122(2): 775-805; at Ewing, Reid. “Growing Cooler: The Evidence on Urban Development and Climate Change” <i>Urban Land Institute</i>. 2007. Chapter 3. 	
Week 4	Transportation for Who?	<ul style="list-style-type: none"> Tomer, Adie, et al. “Missed Opportunities: Transit and Jobs in Metropolitan America” Brookings Metropolitan Policy Program. International Transport Forum and OECD. Income Inequality, Social Inclusion and Mobility. 2017. Chapter 1. Cohen, Stuart and Sahar Shirazi. “Policy Brief: Can We Advance Social Equity with Shared, Autonomous and Electric Vehicles?” <i>ITS Davis</i>. 3 Revolutions. 2017. 	Class Debate and Guest Lecture

THEME 2. TODAY: TECHNOLOGY AND THE TRANSFORMATION OF MOBILITY

Week 5	The Sharing Economy	<ul style="list-style-type: none"> ● Feigon, Sharon and Colin Murphy. (2018) "TCRP Report 195, Broadening Understanding of the Interplay between Public Transit, Shared Mobility, and Personal Automobiles." Transportation Research Board. ● Clewlow, Regina R. and Gouri Shankar Mishra (2017) "Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States." Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-17-07 ● Shared Use Mobility Center. Shared Mobility Action Plan 2017 Scorecard. 	Class Debate
Week 6	Connected and Automated Vehicle Technology	<ul style="list-style-type: none"> ● Aspen Institute Center for Urban Innovation, "Taming the Autonomous Vehicle: A Primer for Cities," <i>Bloomberg Philanthropies</i>, 2017. ● Prior to class, spend 30 minutes online researching the technologies, challenges, opportunities, and impacts behind connected and autonomous vehicle technologies. Your research will prepare you to ask questions to our guest speakers, as well as contribute to the in-class activity. 	Guest Speaker
Week 7	Connected and Automated Vehicle Policy	<ul style="list-style-type: none"> ● "Blueprint for Autonomous Urbanism," NACTO, 2017. ● National Academies of Sciences, Engineering, and Medicine. 2017. "Advancing Automated and Connected Vehicles: Policy and Planning Strategies for State and Local Transportation Agencies," <i>The National Academies Press</i>, 2017. 	Student Presentations Midterm Test
Week 8	Zero Emissions Vehicles and Sustainable Urban Transport	<ul style="list-style-type: none"> ● C40 Cities, "Good Practice Guide: Low Emissions Vehicles." ● Talking Headways Podcast, "Episode 247: Electric Bus Opportunities & Barriers," August 14, 2019. ● Thayne, Julia et al., "Powering the Future of Urban Mobility," Siemens, 2018. ● Prior to class, spend an hour online researching the technologies, challenges, opportunities, and 	Student Presentations and Guest Speaker

		impacts behind alternative fuel vehicles, including battery electric vehicles, hydrogen fuel vehicles, renewable natural gas (RNG) and compressed natural gas (CNG), and plug-in hybrid electric vehicles. Your research will prepare you to ask questions to our guest speakers, as well as contribute to the in-class activity.	
Week 9	Transportation-as-a-Service	<ul style="list-style-type: none"> ● Goodall, Warwick, Tiffany Dovey Fishman, Justine Bornstein, and Brett Bonthron. "The rise of mobility as a service." Deloitte Review. (2017) ● Rocky Mountain Institute, "Interoperable Transit Data: Enabling a shift to mobility as a service," 2015. ● Hand, Ashley. "Urban Mobility in a Digital Age." Prepared for the Los Angeles Department of Transportation. Executive Summary. 	Guest Speaker
THEME 3: IMPLICATIONS OF TECHNOLOGY ON URBAN TRANSPORTATION SYSTEMS OF TOMORROW			
Week 10	New Mobility and Street Design	<ul style="list-style-type: none"> ● Thayne, Julia and Camilla Siggaard Andersen. "Streets Ahead." Gehl, May 2017. Shoup, Lilly and Lauren Grabowski. "Future Proofing Complete Streets." CalPlanner Magazine. pp. 4-5. 	
Week 11	New Mobility and the Public-Private Partnership Paradigm	<ul style="list-style-type: none"> ● Transit Cooperative Research Program (TCRP) Research Report 204: Partnerships Between Transit Agencies and Transportation Network Companies (TNCs) http://www.trb.org/Main/Blurbs/179005.aspx or listen to the webinar summary: http://www.trb.org/Main/Blurbs/179219.aspx ● Office of Extraordinary Innovation. "2019 OEI Innovation Portfolio." 	Student Presentations
Week 12	New Mobility and the Future of Real Estate	<ul style="list-style-type: none"> ● Anderson, Marco, "Policy Brief: Land Use and Transportation Policies" April 2017. ● Green Street Advisors, "The Transportation Revolution: The Impact of Ride-Hailing and Driverless Vehicles on Real Estate," ULI, 2017. 	Class Debate

THEME 4: CATALYSTS IN DRIVING TRANSFORMATION			
Week 13	The 2028 Olympics and Planning the Future of Urban Mobility in LA	<ul style="list-style-type: none"> Kassens-Noor et al. "Olympic Transport Legacies: Rio de Janeiro's Bus Rapid Transit System," <i>Journal of Planning Education and Research</i> 2018, Vol. 38(1) 13-24. 	Guest Speaker and Class Debate
Week 14	Panel, Networking Event, Class Feedback, and Exam Review		
Week 15	Final Exam		

“Learning Experience Evaluations will be conducted before the end of the semester. This will be your opportunity to provide feedback about your learning experience in the class. This feedback helps the instructor determine whether students are having the intended learning experiences for the class. It is important to remember that the learning process is collaborative and requires significant effort from the instructor, individual students, and the class as a whole. Students should provide a thoughtful assessment of their experience, as well as of their own effort, with comments focused on specific aspects of instruction or the course. Comments on personal characteristics of the instructor are not appropriate and will not be considered. For this feedback to be as comprehensive as possible, all students should complete the evaluation.”

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Student Health Counseling Services - (213) 740-7711 – 24/7 on call

engemannshc.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call

suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 – 24/7 on call

engemannshc.usc.edu/rsvp

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) | Title IX - (213) 740-5086

equity.usc.edu, titleix.usc.edu

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

Bias Assessment Response and Support - (213) 740-2421

studentaffairs.usc.edu/bias-assessment-response-support

Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

The Office of Disability Services and Programs - (213) 740-0776

dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Support and Advocacy - (213) 821-4710

studentaffairs.usc.edu/ssu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101

diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.