

# PPD 633: Methods and Modeling Tools for Transportation Planning

## DRAFT Syllabus (as of 3/6/2024)

**Instructor:** Emily Finkel

**Contact info:** efinkel@usc.edu

**Class Time:** Wednesday, 6-9:20 pm

**Location:** DMC 260

**Office Hours:** Tuesdays, noon-1 pm (virtually via Zoom) or by appointment

## Course Description and Objectives

This is a class for graduate students with a focus on transportation planning, travel demand analysis, planning methods and strategies, online tool application, and transportation data analysis. The class covers four major areas:

1. Developing transportation goals and evaluation metrics
2. Transportation data sources
3. Travel demand modeling and forecasting
4. Additional tools and methodologies for multimodal assessment of the transportation system

The latter half of the semester will focus on how to apply the tools and methods covered in the first half.

Most classes will follow this structure:

- Short presentations by students of homework assignment from previous week
- Lecture and discussion
- Introduction of homework assignment and time for in-class work/one-on-one questions

All readings assigned will be available for free through Blackboard or online with your USC Library access.

## Grading Breakdown

Assignment	Points	% of Grade
11 homework assignments @ 30 points each (will use top 10 scores)	300	30%
Class Participation	100	10%
Midterm Project and Presentation	250	25%
Final Project and Presentation	350	35%
<b>Total</b>	1000	100%

## Grading Scale

Points	Letter
930+	A
900-929	A-
870-899	B+
830-869	B
800-829	B-
770-799	C+
730-769	C
700-729	C-
670-699	D+
630-669	D
600-629	D-
Below 600	F

## Course Outline and Schedule of Topics

Week	Date	Unit
1	January 10	Introduction to transportation plans, policies, goals, metrics and evaluation
2	January 17	Transportation Data pt 1
3	January 24	Transportation Data pt 2
4	January 31	Multimodal Analysis Tools pt 1
5	February 7	Multimodal Analysis Tools pt 2
6	February 14	Travel Demand Modeling and Forecasting pt 1
7	February 21	Travel Demand Modeling and Forecasting pt 2
8	February 28	Traffic Operations Analysis Tools
9	March 6	Mid-term projects and presentations
10	March 13	Spring Break
11	March 20	Methods application: Guidance documents
12	March 27	Methods application: Local transportation assessment guidelines
13	April 3	Methods application: Decision making
14	April 10	Methods application: Grant applications
15	April 17	Final project in-class work time
16	April 24	Final projects and presentations

## **Weekly Class Detail**

### Week 1 (Jan 10): Introduction

Assignment due: None

Reading due:

SCAG Connect SoCal Draft Plan

<https://scag.ca.gov/sites/main/files/file-attachments/23-2987-connect-socal-2024-draft-complete-110223.pdf?1698262706>

Chapters 1 and 5

### Week 2 (Jan 17): Transportation Data pt 1

Assignment due: Homework #1

Reading due:

Welch, T. F., & Widita, A. (2019). Big data in public transportation: a review of sources and methods. *Transport Reviews*, 39(6), 795–818.

<https://doi.org/10.1080/01441647.2019.1616849>

Cynthia Chen, Jingtao Ma, Yusak Susilo, Yu Liu, Menglin Wang, The promises of big data and small data for travel behavior (aka human mobility) analysis, *Transportation Research Part C: Emerging Technologies*, Volume 68, 2016, Pages 285-299, ISSN 0968-090X,

<https://doi.org/10.1016/j.trc.2016.04.005>.

### Week 3 (Jan 24): Transportation Data pt 2

Assignment due: Homework #2

Reading due:

Critique of ITE Trip Generation Rates and An Alternative Basis for Estimating New Area Traffic

Fred A. Reid, *Transportation Research Record* 874, 1982

<https://onlinepubs.trb.org/Onlinepubs/trr/1982/874/874-001.pdf>

Roughly Right or Precisely Wrong

Donald Shoup, *Access Magazine*, 2002

<https://www.accessmagazine.org/wp-content/uploads/sites/7/2016/02/access20-04-roughly-right-or-precisely-wrong.pdf>

Phantom Trips

Adam Millard-Ball, *Access Magazine*, 2014

<https://www.accessmagazine.org/wp-content/uploads/sites/7/2015/01/access45-Phantom-Trips-revise-links.pdf>

Innovations in Estimating Trip Generation Rates

Boston Region MPO

<https://www.ctps.org/data/html/studies/other/Innovations-Trip-Generation-Rates/Innovations-in-Estimating-Trip-Generation-Rates.html>

Week 4 (Jan 31): Multimodal Analysis Tools pt 1

Assignment due: Homework #3

Reading due:

Evaluating Accessibility for Transport Planning  
Todd Litman, Victoria Transport Policy Institute  
<https://www.vtpi.org/access.pdf>

Bearn, C., Mingus, C., & Watkins, K. (2018). An adaption of the level of traffic stress based on evidence from the literature and widely available data. *Research in Transportation Business & Management*, 29, 50–62. <https://doi.org/10.1016/j.rtbm.2018.12.002>

Week 5 (Feb 7): Multimodal Analysis Tools pt 2

Assignment due: Homework #4

Reading due:

Manaugh, K., Badami, M. G., & El-Geneidy, A. M. (2015). Integrating social equity into urban transportation planning: A critical evaluation of equity objectives and measures in transportation plans in North America. *Transport Policy*, 37, 167–176.  
<https://doi.org/10.1016/j.tranpol.2014.09.013>

Brodie, S., & Amekudzi-Kennedy, A. (2017). Performance-Based Methodology for Evaluating Equity for Transportation System Users. *Transportation Research Record: Journal of the Transportation Research Board*, 2605(1), 83–91. <https://doi.org/10.3141/2605-08>

Brozen, M., & Yahata Ekman, A. (2020). The Need to Prioritize Black Lives in LA's Traffic Safety Efforts.  
<https://escholarship.org/content/qt0dm6x8k4/qt0dm6x8k4.pdf>

Week 6 (Feb 14): Travel Demand Modeling and Forecasting pt 1

Assignment due: Homework #5

Reading due:

NCHRP Report 716: Travel Demand Forecasting: Parameters and Techniques  
Chapters 1-3

Week 7 (Feb 21): Travel Demand Modeling and Forecasting pt 2

Assignment due: Homework #6

Reading due:

NCHRP Report 716: Travel Demand Forecasting: Parameters and Techniques  
Chapters 4 and 6

Bills, T. S., Sall, E. A., & Walker, J. L. (2012). Activity-Based Travel Models and Transportation Equity Analysis: Research Directions and Exploration of Model Performance. Transportation Research Record, 2320(1), 18–27. <https://doi.org/10.3141/2320-03>

The Broken Algorithm That Poisoned American Transportation  
Aaron Gordon, Vice Magazine

<https://www.vice.com/en/article/v7qxy9/the-broken-algorithm-that-poisoned-american-transportation-v27n3>

### Week 8 (Feb 28): Traffic Operations Analysis Tools

Assignment due: Homework #7

Reading due:

Highway Capacity Manual  
Chapter 2: Capacity and Level-of-Service Concepts

Afrin, T., & Yodo, N. (2020). A survey of road traffic congestion measures towards a sustainable and resilient transportation system. Sustainability (Basel, Switzerland), 12(11), 4660-. <https://doi.org/10.3390/su12114660>

### Week 9 (Mar 6): Mid-Term Projects and Presentations

Assignment due: Mid-term projects and presentations

Reading due: None

### Week 10 (Mar 13): Spring Break

Assignment due: None

Reading due: None

### Week 11 (Mar 20): Methods application: Guidance documents

Assignment due: None

Reading due:

Taylor, B. D., & Hong Hwang, Y. (2020). Eighty-Five Percent Solution: Historical Look at Crowdsourcing Speed Limits and the Question of Safety. Transportation Research Record, 2674(9), 346–357. <https://doi.org/10.1177/0361198120928995>

NACTO Statement on the Release of the 11th Edition of the MUTCD, Which Governs How Nearly Every Street in the U.S. Is Designed (click through and explore links)

December 2023

<https://nacto.org/2023/12/20/mutcd-11-reaction/>

FHWA Bikeway Selection Guide

[https://safety.fhwa.dot.gov/ped\\_bike/tools\\_solve/docs/fhwasa18077.pdf](https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf)

Week 12 (Mar 27): Methods application: Local transportation assessment guidelines

Assignment due: Guidance documents homework

Reading due:

LADOT Local Transportation Assessment Guidelines, August 2022

[https://ladot.lacity.gov/sites/default/files/documents/2020-transportation-assessment-guidelines\\_final\\_2020.07.27\\_0.pdf](https://ladot.lacity.gov/sites/default/files/documents/2020-transportation-assessment-guidelines_final_2020.07.27_0.pdf)

Sections 1 and 3

Week 13 (Apr 3): Methods application: Decision marking

Assignment due: Public meeting homework (previously called #8)

Reading due:

Measure HLA and Mobility Plan Report, City of Los Angeles CAO, February 15, 2024:

[https://clkrep.lacity.org/onlinedocs/2023/23-0600-S54\\_rpt\\_CAO\\_02-15-24.pdf](https://clkrep.lacity.org/onlinedocs/2023/23-0600-S54_rpt_CAO_02-15-24.pdf)

Week 14 (Apr 10): Methods application: Grant applications

Assignment due: Local transportation assessment guidelines homework

Reading due:

Lowe, K., Reckhow, S., & Gainsborough, J. F. (2016). Capacity and Equity: Federal Funding Competition between and Within Metropolitan Regions. *Journal of Urban Affairs*, 38(1), 25–41. <https://doi.org/10.1111/juaf.12203>

Making Federal Funding Work for Cities

NACTO and Transportation for America, March 2021

<https://nacto.org/wp-content/uploads/2021/03/Making-Federal-Funding-Work-for-Cities.pdf>

Week 15 (Apr 17): Final Project In-Class Work Time

Assignment due: Grant applications homework

Reading due: None

Week 16 (Apr 24): Final Projects and Presentations

Assignment due: Final project and presentation

Reading due: None

## **Statement on Academic Conduct and Support Systems**

### **Academic Integrity:**

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, compromises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

### **AI-Generated Material**

In this course, I encourage you to use artificial intelligence (AI)-powered programs to help you with assignments that indicate the permitted use of AI. You should also be aware that AI text generation tools may present incorrect information, biased responses, and incomplete analyses; thus they are not yet prepared to produce text that meets the standards of this course. To adhere to our university values, you must cite any AI-generated material (e.g., text, images, etc.) included or referenced in your work and provide the prompts used to generate the content. Using an AI tool to generate content without proper attribution will be treated as plagiarism and reported to the Office of Academic Integrity.

### **Students and Disability Accommodations:**

USC welcomes students with disabilities into all of the University's educational programs. [The Office of Student Accessibility Services](#) (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and

accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](https://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu).

## **Support Systems:**

[\*Counseling and Mental Health\*](#) - (213) 740-9355 – 24/7 on call

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

[\*988 Suicide and Crisis Lifeline\*](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[\*Relationship and Sexual Violence Prevention Services \(RSVP\)\*](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[\*Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)\*](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[\*Reporting Incidents of Bias or Harassment\*](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[\*The Office of Student Accessibility Services \(OSAS\)\*](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[\*USC Campus Support and Intervention\*](#) - (213) 740-0411

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

[\*Diversity, Equity and Inclusion\*](#) - (213) 740-2101

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

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) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or [otfp@med.usc.edu](mailto:otfp@med.usc.edu)

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.