INTRODUCTION TO TRANSPORTATION PLANNING
(WILLIAMS HALL 25 | TR 10:15AM-11:45AM)

• Instructor: Associate Professor Erick Guerra, 312 Duhring Wing
• Direct Contact: E-mail is the best way to reach me: erickg@upenn.edu. Replies in 1-2 business days during regular hours.
• Questions: Please post course-related questions to Canvas. Emailing course-related questions will delay responses.
• Office Hours: TBD and by appointment. Sign up: http://www.wejoinin.com/ibambe@gmail.com

COURSE OVERVIEW
This course provides an overview and introduction to urban transportation planning and policy. Although the focus is on US transportation, the course will also pay special attention to transportation issues in the fast-growing cities of the developing world. The first section of the course focuses on histories and theories of transportation. How and why do we travel? How have we gotten where we are today? The next section looks at larger policy questions, such as who transportation planning benefits and how we evaluate transportation systems. The third section on 4-step modeling and predicting transportation demand. The final section applies what we learn in the first three sections to look at more specific policies, such as congestion charging, bicycle planning, and traffic calming.

Throughout the course, I introduce a series of labs and lectures to familiarize you with available transportation data and a variety of transportation planning methods. Please be sure to download R, R-Studio, and any indicated datasets prior to a lab session. Labs will be essential for completing semiweekly homework assignments

COURSE REQUIREMENTS
Student evaluations are based on two exams and five homework assignments. The homework assignments will help you develop the ability to describe existing transportation and land use conditions and use data to predict demand or evaluate transportation planning policies and investments. The midterm and final exam will ask you to write short answers and memos responding to specific question prompts and will require you to draw on the readings, lectures, and assignments covered throughout the course. The final exam will emphasize the last half of the course but test your knowledge and comprehension of transportation planning history and theory, travel behavior, demand modeling, and project evaluation.

Homework assignments will be evaluated as check minus, check, and check plus. Assignments may be completed in pairs and are due in hard copy at the beginning of class. Incomplete or late assignments will receive a check minus. The assignments are designed to help you synthesize the material of each section, develop the ability to work with
transportation data, and evaluate what you have learned. If you are struggling to complete any of the course material or need an extension for any assignments, please do not hesitate to contact me. I am generally happy to grant extensions when asked in advance.

**Approximate grading weights**
Midterm (25%), Homework (25%), final exam (50%).

**Final paper (in lieu of final exam)**
Instead of the final exam, you may opt to produce a final paper to explore a transportation area or dataset in depth. I recommend choosing one of the following options:

1) Describing and answering a simple research question using an existing dataset (e.g., summarizing and discussing the relative costs and ridership of light rail or heavy rail transit in the United States); or
2) Summarizing the state of academic knowledge about a specific research topic, such as whether and by how much bike lanes increase traffic safety or whether and by how much BRT increases transit use.

In both cases, your paper will need: (1) an introduction that defines the question and why it is important, (2) a methods section that explains what you did (if a lit review, how did you choose the literature you reviewed?), (3) a findings section that summarizes the findings, (4) a discussion section that explains what the findings mean, and (5) a conclusion that summarizes your paper.

If you would like to write a final paper instead of taking the exam, please submit a one-to-three paragraph paper proposal to Canvas by November 9.

**Assignment and exam dates**

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<th>Assignments/Exams</th>
<th>Due Date</th>
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<tr>
<td>HW 1 Traffic counts</td>
<td>Thursday 9/15</td>
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<td>HW 2 Census analysis</td>
<td>Tuesday 9/27</td>
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<tr>
<td>HW 3 Household travel survey</td>
<td>Thursday 10/13</td>
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<tr>
<td><strong>Midterm exam</strong></td>
<td><strong>Thursday 10/20</strong></td>
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<td>HW 4 Demand modeling</td>
<td>Tuesday 11/15</td>
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<tr>
<td>HW 5 Describing transit</td>
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<tr>
<td><strong>Final exam</strong></td>
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<td><strong>Final paper (in lieu of exam)</strong></td>
<td><strong>Monday 12/19</strong></td>
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Readings
There is one required textbook for the course:


It is available through on-line book retailers like Amazon.com. The remaining required readings are available online through Canvas. Where possible, I also provide hyperlinks to articles in the reading list. You will only be able to access them through a Penn-connected computer or through a library proxy.

If for some reason a link is broken, you are still required to access the reading. I recommend using the Penn library or Google Scholar.

Participation
Come prepared to participate in class discussions. To be prepared, you must complete all required readings and be ready to discuss them with the class. This is an important component of the course and your learning experience.

Software
Please install R and R-Studio onto your personal computer. You will need these programs for the lab sessions. If you are familiar with R, you may use any text editor that you prefer. If not, please use R-Studio. Both programs are fully functional with Windows, Macs, and Linux machines.

http://cran.r-project.org/
http://www.rstudio.com/

If you would like to use a point-and-click GUI, several are available. I will not, however, be supporting these in class, if you have a technical issue. I will provide you with sufficient code to complete all course assignments. While you will certainly learn some coding during the class, you will be able to accomplish assignments by cutting and pasting from text files that I provide. No prior coding experience is needed.

I will also be providing additional labs throughout the semester.

Plagiarism and academic integrity
Do not plagiarize. If you have any questions about what constitutes plagiarism, please consult the University’s official policy for academic integrity. If you continue to have any questions, please come talk to me or send me an email. Plagiarism can lead to failure and even expulsion. Plagiarism harms you, your colleagues, the University, the department, and your professors. Don’t do it. If you are having trouble completing any assignment, please arrange a time to speak with me in person.
READING LIST AND CLASS SCHEDULE

An asterisk indicates that the reading is available in the required textbook.

PART I: HISTORIES AND THEORIES

1.1 (8/30): Introduction and Overview
Welcome to class! No readings.

1.2 (9/1): Trends in urban transportation
*Chapter 1. (Hanson, S.): Introducing Urban Transportation

(Optional readings)

2.1 (9/6): Transportation and the evolution of urban form
*Chapter 3. (Muller, P.): Transportation and urban form: Stages in the spatial evolution of the American metropolis.

(Optional readings)

2.2 (9/8): The transportation and land use connection

(Optional readings)

3.1 (9/13): Lab: supply, demand, price, and elasticities
This is the first lab session. Please be sure to download and install R and R-Studio prior to class.
Spend 30 minutes walking through this tutorial (it has installation instructions too):
http://web.cs.ucla.edu/~gulzar/rstudio/basic-tutorial.html


3.2 (9/15) The transportation planning process
*Chapter 6. (Sciara, G. and Handy, S.): Regional Transportation Planning

4.1 (9/20) Finance and equity
*Chapter 10. (Taylor, B.): The Geography of Urban Transportation Finance.
(Optional readings)

4.2 (9/22) Transportation data and the transportation plan
*Chapter 7. (Boarnet, M.): Land Use, Travel Behavior, and Disaggregate Travel Data

Download DVRPC’s 2012 household travel survey (spend a little time reviewing the data dictionary and be sure to carefully read the README: https://www.dvrpc.org/Transportation/Modeling/Data/zip/PublicDB_RELEASE.zip

Quick lab: set working directory and open files

5.1 (9/27) Lab session: summarizing transportation data
No reading: Walk through Philadelphia Household Travel Survey lab 1. If you do not complete this first lab, you may struggle with the second in class lab.

PART II: POLICY AND PROJECT EVALUATION

5.2 (9/28) Introduction to projection evaluation and cost-benefit analysis

(Optional readings)
6.1 (10/4) Social costs and benefits

(Optional readings)

6.2 (10/6) Fall break
No class

7.1 (10/12) Assessing environmental impacts (ASIF)

(Optional readings)
*Chapter 12. (Greene, L.): Transportation and Energy

7.2 (10/13) Level of service, mobility, and accessibility


8.1 (10/18) My ongoing research
No readings for today. Focus on preparing for exam.

8.2 (10/20) Midterm exam

PART III: PREDICTING TRANSPORTATION DEMAND

9.1 (10/25) The demand for transportation
9.2 (10/27) The 4-step model
*Chapter 5. (Miller, H.): Theories and Models in Transportation Planning

(Optional readings)

10.1 (11/1) Class lab: Linear regression and direct demand modeling
Bring your computer with dataset loaded.


10.2 (11/3) Choice and count models for transportation planning (ACSP)

PART IV: MULTIMODAL TRANSPORTATION PLANNING POLICIES

11.1 (11/8) Dealing with congestion
*Chapter 14. (Giuliano, G. with Hanson, S.): Looking to the Future

11.2 (11/10) Multimodal urban planning
Guest lecture: Chris Puchalsky on Philadelphia’s Strategic Transportation Plan

12.1 (11/15) Urban Freight
*Chapter 2. (Lablanc, L. and Rodrigue, J.P.) The Geography of Urban Freight

12.2 (11/17) The high cost of free parking

(Optional Readings)
Website: http://sfpark.org/about-the-project/pilot-evaluation/
**13.1 (11/22) Public transportation: an overview**


(Optional Readings)


**13.2 (11/24) Thanksgiving**

No class.

**14.1 (11/29) Air transportation planning**

Guest lecture: Megan Ryerson


(Optional Readings)


**14.2 (12/1) Bicycle and pedestrian planning**


**15.1 (12/6) Doctoral research into transportation planning at Penn**

No readings for today. Guest panel.

**15.2 (12/8) The future of urban transportation**


*Chapter 4. (Circella, G. and Mokhtarian, P.) Impacts of Information and Communication Technology.*