

UP 430/CEE 417: Urban Transportation Planning

University of Illinois at Urbana-Champaign

Department of Urban and Regional Planning

Spring 2016

CLASS MEETINGS: Mondays, 5:00-7:50 pm
ROOM: 225 Temple Buell Hall (Lab: 227 TBH)
INSTRUCTORS: Rita Morocoima-Black, rmorocoi@illinois.edu
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COURSE OVERVIEW

Our transportation systems influence virtually every aspect of community life. They are the means for moving people, goods and services throughout our communities, the region, and, increasingly, to destinations around the world. Of equal importance, these systems have played a significant role in shaping patterns of growth, facilitating economic prosperity, and influencing the character and livability of our communities.

As a result, transportation planning is a particularly important component in the overall planning for what we want our communities to be. Past decisions about transportation system development were not always based on a comprehensive review of the diverse needs and interrelationships that influence whether we achieve both effective transportation systems and livable communities. Decisions were not necessarily based on a clear vision about a community's future. Instead, much of our current inventory of transportation facilities was built on a project-by-project basis, often in reaction to traffic congestion or other problems. Planning, development and operational responsibility for various pieces of the transportation network has been divided among federal, state, and local government agencies, regional transit agencies, port districts, and the private sector. The efforts of these various agencies have not always been coordinated to create an efficient, seamless transportation system.

This course will examine a number of the more important issues, descriptive and analytical, dealing with urban transportation. We begin by taking a close look at the historical development of urban transportation and the fundamental question of the role of transportation in urban development. We will continue by examining the characteristics of the urban transportation system and the different modes of transportation and their planning processes while emphasizing the use of analytical tools.

TEXTBOOKS

There are two required textbooks:

The Geography of Urban Transportation, 3rd edition, edited by Susan Hanson and Genevieve Giuliano (2004, The Guilford Press)

Modelling Transport, 4th edition, Juan de Dios Ortuzar and Luis G. Willumsen (2011, Wiley). They will be available for purchase at the Illini Bookstore and on Amazon.

Readings not included in the two required textbooks will be available on the course website.

HOMEWORK ASSIGNMENTS AND GROUP FINAL PROJECT

A number of assignments will be required for the course. The purpose of the homework assignments is to provide opportunities to integrate the principles of the course by analyzing selected problems in urban transportation. Four written assignments will be required: two analytical memoranda and a small group project including data collection and analysis. These assignments have staggered due dates timed to correspond with the subject areas covered in class.

The written assignments are going to be distributed during class. All written assignments (hardcopy only) should be placed on my desk at the beginning of the class on the due date of the assignment. Late assignments will not be accepted except under unusual circumstances.

Homework 1 (Due Date - February 1): 5%
Homework 2 (Due Date – February 8): 5%
Homework 3: (Due Date – February 22): 10%
Homework 4: (Due Date – March 7): 10%

A group final project will also be assigned. Detailed instructions about the final group project will follow.

GRADING

The final grade for the course will be made up of the following components:

- Homework: 30%
- Quizzes: 20%
- Final Project and Presentation: 40%
- Attendance: 10%

Laptops should be used only for note taking. **No web surfing! No texting!**
Phones are expected to be turned off during class time.

DURP CODE OF CONDUCT: INCLUSIVENESS & PROFESSIONALISM

CLASS CLIMATE

The Department of Urban and Regional Planning (DURP) is committed to creating an environment of inclusion and opportunity that is rooted in the very goals and responsibilities of practicing planners. This responsibility requires planners to adhere to the highest standards of professionalism and integrity in the workplace, with coworkers, and with the public. As a result, the development of responsible, ethical, professional behavior is a critical component of professional planning education. DURP expects all students to meet and exceed the standards outlined in the University of Illinois Student Code. See Student Code Article 1—Student Rights and Responsibilities, Part 1. Student Rights: §1-102 In the Classroom.

ACADEMIC INTEGRITY

This course follows the guidelines set forth by the University student code. See http://www.admin.uiuc.edu/policy/code/article_1/a1_1-401.html for specific guidelines, examples, and punishment associated with academic dishonesty.

COURSE SCHEDULE

- **Week 1 (January 25)** - Course overview. Introduction and key concepts. History of the urban transportation systems and its relationship with the urban environment
- **Week 2 (February 1)** - History of the Transportation Planning Process: Changes. Impacts of Transportation Policies in Land Use
- **Week 3 (February 8)** - Transportation planning at the federal level, regional and local level
- **Week 4 (February 15)** - Planning for automobiles and transit
- **Week 5 (February 22)** - Planning for walking and biking: Changes in mode choices
- **Week 6 (February 29)** - Transportation and the built environment. Health Implications
- **Week 7 (March 7)** - The role of models in transportation planning
- **Week 8 (March 14)** - Introduction to Travel Demand Forecasting
- **Week 9 (March 21)** - Spring Break
- **Week 10 (March 28)** - Methods and issues with modeling and forecasting
- **Week 11 (April 4)** - Trip Generation Modeling
- **Week 12 (April 11)** - Trip Distribution Modeling
- **Week 13 (April 18)** - Mode Choice Modeling
- **Week 14 (April 25)** - Model Aggregation and Transferability
- **Week 15 (May 2)** - Traffic Assignment Modeling
- **Week 16 (May 9)** - Final Project Presentation

INTRODUCTION TO TRANSPORTATION PLANNING AND COURSE OVERVIEW

* indicates optional readings.

Week 1: January 25

Course overview. Introduction and key concepts. History of the urban transportation systems and its relationship with the urban environment.

Susan Hanson. 2004. "The Context of Urban Travel: Concepts and Recent Trends". Chapter 1 in *"The Geography of Urban Transportation"*, 3rd edition, edited by Susan Hanson and Genevieve Giuliano. New York: The Guilford Press. Pages 3-29.

Robert Cervero, R. 2003. "Are Induced-Travel Studies Inducing Bad Investments?" Access 22. Pages 22- 27.

Alan Pisarski. 2010. "Livability and All That," *New Geography*. (<http://www.newgeography.com/content/001865-livability-and-all-that>).

Transportation Research Board. 2013. "Critical Issues in Transportation."

*Susan Handy. 1994. "Highway Blues: Nothing a Little Accessibility Can't Cure." Access 5. Pages 3-7.

*Todd Litman. 2012. "Comprehensive Transport Planning Framework." Victoria Transport Policy Institute.

*Marlon Boarnet. 2011. "A Broader Context for Land Use and Travel Behavior, and a Research Agenda." *Journal of the American Planning Association*, 77(3), Pages 197-213.

Week 2: February 1

History of the Transportation Planning Process: Changes. Impacts of Transportation Policies in Land Use

Peter Muller. 2004. "Transportation and Urban Form: Stages in the Spatial Evolution of the American Metropolis." Chapter 3 in "*The Geography of Urban Transportation*", 3rd edition, edited by Susan Hanson and Genevieve Giuliano. New York: The Guilford Press. Pages 59-85.

Alan Pisarski. 2012. "Working Through the Evolving Legacy of Metropolitan Transportation Planning." *Transportation Research News* 283. Pages 27-36.

Todd Litman. 2014. "Land Use Impacts On Transport: How Land Use Factors Affect Travel Behavior." Victoria Transport Policy Institute.

Todd Litman. 2013. "The New Transportation Planning Paradigm." *ITE Journal*. June 2013.
<http://www.vtpi.org/paradigm.pdf>

Randall Crane. 1998. "Travel by Design?" *Access* 12, Pages 2 – 7.

Week 3: February 8

Transportation planning at the federal level, regional and local level

Martin Wachs. 2004. "Reflections on the Planning Process," Chapter 6 in "*The Geography of Urban Transportation*", 3rd edition, edited by Susan Hanson and Genevieve Giuliano. New York: The Guilford Press. Pages 141-162.

FHWA. 2012. "Moving Ahead for Progress in the 21st Century Act (MAP-21)." A Summary of Highway Provisions.

"A Bridge to Somewhere: Rethinking American Transportation for the 21st Century." 2008. Brookings.

James Andrews. 1996. "Metro Power." *Planning*.

"Performance Driven: A New Vision for U.S. Transportation Policy." 2009. *National Transportation Policy Project*.

Susan Handy and Gian-Claudia Sciara. 2014. "Chapter 6: Regional Transportation Planning."

USDOT. "A Guide To Transportation Decision Making." Publication No. FHWA-HEP-09-034.

*Federal Highway Administration. 2007. "The Transportation Planning Process: Key Issues."

*US EPA. 2011. "Guide to Sustainable Transportation Performance Measures."

*FHWA. 2013. "Performance Based Planning and Programming Guidebook."

Week 4: February 15

Planning for automobiles and transit

Genevieve Giuliano and Susan Hanson. 2004. "Managing the Auto". Chapter 14 in *"The Geography of Urban Transportation"*, 3rd edition, edited by Susan Hanson and Genevieve Giuliano. New York: The Guilford Press. Pages 382-403.

John Pucher. 2004. "Public Transportation". Chapter 8 in *"The Geography of Urban Transportation"*, 3rd edition, edited by Susan Hanson and Genevieve Giuliano. New York: The Guilford Press. Pages 199-236.

Brian Taylor. 2006. "Putting a Price on Mobility: Cars and Contradictions in Planning," *Longer View, Journal of the American Planning Association*, 72 (3): 279-284.

Damien Newton and Melanie Curry. 2014. "California Has Officially Ditched Car-Centric 'Level of Service'."

Michael Manville and Donald Shoup. 2004. "People, Parking, and Cities." *Access 25*. Pages 2-8.

Aaron Golub. 2004. "Brazil's Buses: Simply Successful." *Access 24*. Pages 2-9.

Martin Wachs. 2012. "Planning for High Speed Rail." *Access 41*. Pages 38-40.

*Transit Cooperative Research Program. 2003. "Transit Capacity and Quality of Service Manual, 2nd Edition. Part 1. Introduction and concepts." Washington, D.C.:Transportation Research Board.

*Maria Borjesson, Jonas Eliasson, et al. 2012. "The Stockholm congestion charges-five years on. Effects, acceptability and lessons learnt." *Transport Policy 20(0)*. Pages 1-28.

*Jeffrey Brown, Daniel Baldwin Hess, and Donald Shoup. 2003. "Fare-Free Public Transit at Universities – An Evaluation." *Journal of Planning Education and Research 23 (1)*. Pages 69-82.

*American Public Transportation Association. 2012. *Public Transportation Fact Book, 63rd Edition*. Washington, D.C.

Week 5: February 22

Planning for walking and biking: Changes in mode choices

Tal and Handy. 2011. "Measuring Non-motorized Accessibility and Connectivity in a Robust Pedestrian Network." *Institute of Transportation Studies*. UC Davis.

Boarnet, M., J. Kenneth, W. Siembab, W. Fulton, and M. Nguyen. 2011. "Retrofitting the Suburbs to Increase Walking." *Access 39*. Pages 2-7.

Todd Litman. 2014. "Economic Value of Walkability." *Victoria Transport Policy Institute*.

City of Los Angeles. 2008. *Walkability Checklist*.

John Zacharias. 1999. "The Amsterdam Experiment in Mixing Pedestrians, Trams, and Bicycles." *ITE Journal*. Pages 22-28.

Active Living Research. 2013. "How to Increase Bicycling for Daily Travel."

Kevin Krizek, Gavin Poindexter, Gary Barnes, and Paul Mogush. 2007. "Analyzing the benefits and costs of bicycle facilities via online guidelines." *Planning Practice and Research* 22 (2). Pages 197-213.

Wesley Marshall and Norman Garrick. 2011. "Evidence on Why Bike-Friendly Cities Are Safer for All Road Users." *Environmental Practice* 13 (01). Pages 16-27.

* Kevin Krizek, Gavin Poindexter, Gary Barnes, and Paul Mogush. 2006. "Guidelines for Analysis of Investments in Bicycle Facilities." *National Cooperative Highway Research Program (NCHRP) Report 552*. Transportation Research Board.

*John Pucher, Jennifer Dill and Susan Handy. 2010. "Infrastructure, programs, and policies to increase bicycling: An international review." *Preventive Medicine* 50. Pages 106-125.

*Ed Barsotti and Gin Kilgore. "The Road Network is the Bicycle Network: Bicycle Suitability Measures for Roadways and Sidepaths." Transport Chicago Conference 2011. Unpublished manuscript.

Week 6: February 29

Transportation and the built environment. Health Implications.

Urban Design 4 Health. The Hidden Health Costs of Transportation.

Frank, L., et al. Many pathways from land use to health: Associations between neighborhood walkability and active transportation, body mass index, and air quality. *Journal of the American Planning Association*, Vol. 72, No. 1, (Winter 2006): 75-87.

Susan Handy and Kelly Clifton. Planning and the Built Environment: Implications for Obesity Prevention. *Handbook of Obesity Prevention*.

*Active Design Guidelines. 2010. Promoting Physical Activity and Health in Design. New York City.

Week 7: March 7

The role of models in transportation planning (Guest lecture on CUUATS Modeling Suite)

Robert Johnston. 2004. "The Urban Transportation Planning Process." Chapter 5 in *The Geography of Urban Transportation*, 3rd edition, edited by Susan Hanson and Genevieve Giuliano. New York: The Guilford Press. Pages 115-140.

Peter Furnish and Don Wignall. Making the Most of Models. 2009. Victoria Transport Policy Institute.

Kenworthy, Jeff. 2012. "Don't Shoot Me, I'm Only The Transportation Planner." *World Transport Policy and Practice* 18 (4). Pages 6-26.

Week 8: March 14

Introduction to Travel Demand Forecasting

Beimborn, E. A. 2006. *A Transportation Modeling Primer*, Center for Urban Studies, University of Wisconsin-Milwaukee

Week 9: March 21

Spring Break

Week 10: March 28

Methods and issues with modeling and forecasting, Trip Generation Modeling

Ortuzar, J, *Modeling Transport*, 4th Edition, Chapter 4 (Course Text Book)

NCHRP Report 365: *Travel Estimation Techniques for Urban Planning*, Chapter 2 and Chapter 3.

Week 11: April 4

Trip Distribution Modeling

Ortuzar, J, *Modeling Transport*, 4th Edition, Chapter 5 (Course Text Book)

NCHRP Report 365: *Travel Estimation Techniques for Urban Planning*, Chapter 4.

Week 12: April 11

External Travel Estimation and Mode Choice Modeling

Ortuzar, J, *Modeling Transport*, 4th Edition, Chapter 6 (Course Text Book)

NCHRP Report 365: *Travel Estimation Techniques for Urban Planning*, Chapter 5 and Chapter 6.

Week 13: April 18

Model Aggregation and Transferability

Ortuzar, J, *Modeling Transport*, 4th Edition, Chapter 9 (Course Text Book)

NCHRP Report 365: *Travel Estimation Techniques for Urban Planning*, Chapter 7 and Chapter 8.

Week 14: April 25

Traffic Assignment Modeling

Ortuzar, J, *Modeling Transport*, 4th Edition, Chapter 10 (Course Text Book)

NCHRP Report 365: *Travel Estimation Techniques for Urban Planning*, Chapter 9 and Chapter 10.

Week 15: May 2

Freight Demand Model and Activity Based Modeling

Ortuzar, J, *Modeling Transport*, 4th Edition, Chapter 13 (Course Text Book)

NCHRP Report 716: *Travel Demand Forecasting: Parameters and Techniques*, Chapter 6

Week 16: May 9
Final Project Submission and Group Presentation