

## UPP 560

### Urban Transportation Planning I: Introduction

Time: Tuesdays 6 PM– 9 PM  
Class Room: 216 2TH (Taft Hall)

Instructor: Kazuya Kawamura  
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#### Course Description

This course introduces students to the issues, ideas, and techniques associated with urban transportation planning. Topics to be covered include: the role of transportation in society, land use-transportation relationship, domestic travel patterns and other transportation facts, overview of transportation planning methods, environment and transportation, recent development in transportation policy, and current perspectives on urban transportation planning. This course is designed to expose students to a wide range of issues surrounding transportation planning. Students specializing in areas other than transportation should benefit as well as transportation specialists. Advanced students (e.g. doctoral), will be given additional readings for some of the topics covered.

#### Useful Reference Material

- Meyer and Miller. *Urban Transportation Planning*, 2<sup>nd</sup> Ed. McGraw Hill, 2000
- The Geography of Urban Transportation, 3<sup>rd</sup> S. Hanson and G. Giuliano (ed.). Guilford, 2004
- *Transportation Planning Handbook*. John Edwards (ed.). Institute of Transportation Engineers, 1999
- Khisty and Lall. *Transportation Engineering: An Introduction*. Prentice Hall 1999
- Gomez-Ibanez, Tye, and Small. *Essays in Transportation Economics and Policy*. Brookings Institute Press. 1999
- John Dickey, *Metropolitan Transportation Planning*. Taylor & Francis, 1983
- Small, Kenneth. *Urban Transportation Economics*. Harwood Academic Publishers. 1992

## **Requirements**

The course will be taught using a lecture/discussion format. Grades will be based on homework assignments (40%), quizzes (20%), final (take home) exam (30%), and class attendance and participation (10%).

Quizzes will be given randomly in class and cover reading assignments.

## **Academic Honesty**

Students are not permitted to discuss the contents of assignments with other students before the submittal unless otherwise noted. Any form of academic dishonesty, especially plagiarism, will be severely punished (at a minimum, “F” for the course). Please make sure to site a reference whenever you “borrow” ideas or quotes from existing sources including books, articles, web sties, etc.

## **Tentative Schedule**

- Except for the first class, you are expected to have read reading assignments before each lecture.

Week	Date	Subjects
1 <sup>st</sup>	8/29	<ul style="list-style-type: none"><li>• Overview of transportation planning and role of transportation planners</li><li>• Transportation as a system</li><li>• Transportation and society</li></ul>
2 <sup>nd</sup>	9/5	<ul style="list-style-type: none"><li>• Cost of transportation</li><li>• Transportation and land use</li></ul>
3 <sup>rd</sup>	9/12	<ul style="list-style-type: none"><li>• Transportation and land use (cont.)</li><li>• Smart Growth</li></ul>
4 <sup>th</sup>	9/19	Early transportation
5 <sup>th</sup>	9/26	Birth of modern transportation planning
6 <sup>th</sup>	10/3	Data needs and collection
7 <sup>th</sup>	10/10	<ul style="list-style-type: none"><li>• Simple demand analysis</li><li>• Demand analysis - trip generation</li></ul>
8 <sup>th</sup>	10/17	Demand analysis – trip distribution
9 <sup>th</sup>	10/24	Demand analysis – mode choice
10 <sup>th</sup>	10/31	Demand analysis – trip assignment, validation and implementation
11 <sup>th</sup>	11/7	<ul style="list-style-type: none"><li>• Land use modeling</li><li>• Supply analysis</li></ul>
12 <sup>th</sup>	11/14	Environmental impacts and sustainability
13 <sup>th</sup>	11/21	Transportation system management
14 <sup>th</sup>	11/28	Transit planning
15 <sup>th</sup>	12/5	Urban design and transportation: parking, traffic management, & street design

## Reading assignments:

Articles can be either downloaded from the Courseinfo site or the URL addresses shown. Some articles will be in-class handouts.

### Week 1

#### ▪ **Topic:**

- Overview of transportation planning and role of transportation planners
- Transportation as a system
- Transportation and society

#### ▪ **Required Readings:**

1. Khisty, C.J. & Lall, B.K. (1998). Transportation as a System. In Transportation Engineering: An Introduction (2<sup>nd</sup> ed.) (pp. 1-30). Upper Saddle River, NJ: Prentice Hall. Available at the course web site
2. Purcher, J. and Renne, J.L. (2003). Socioeconomics of Urban Travel: Evidence from the 2001 NHTS. Transportation Quarterly, 57 (3), 49-77. Available at the course web site

#### ▪ **Suggested Readings:**

1. Rosenbloom, S. (2003). The Mobility Needs of Older Americans: Implications for Transportation Reauthorization. The Brookings Institution Series on Transportation Reform. Washington, D.C.: The Brookings Institution. Available at [http://www.brookings.edu/es/urban/publications/20030807\\_Rosenbloom.pdf](http://www.brookings.edu/es/urban/publications/20030807_Rosenbloom.pdf)

### Week 2

#### ▪ **Topic:**

- Cost of transportation
- Transportation and land use

#### ▪ **Required Readings:**

1. Gomez-Ibanez, J. (1997). Estimating Whether Transport Users Pay Their Way: The State of the Art. In Greene, D.L., Jones, D.W., & Delucchi, M.A. (Eds.), The Full Costs and Benefits of Transportation (pp. 149-172). New York: Springer Verlag. Available at the course web site.
2. Transportation Costs Primer. Sacramento Transportation & Air Quality Collaborative. Available at [http://www.sactaqc.org/Resources/primers/Primer\\_Transportation\\_Costs.htm](http://www.sactaqc.org/Resources/primers/Primer_Transportation_Costs.htm)
3. Muller, P.O. (2004). Transportation and Urban Form: Stages in The spatial Evolution of the American Metropolis. In Hanson, S. (Eds.), The Geography of Urban Transportation (3<sup>rd</sup> ed.) (pp. 59-85). New York: The Guilford Press. Available at the course web site.
4. Button, K.J. (1993). 2.5. Urban Transportation and Land Values & 2.6. Transport and Urban Wage Rate, In Transport and Economics (2<sup>nd</sup> ed.) (pp.30-38). Northampton, Mass: Edward Alger. Available at the course web site.

#### ▪ **Suggested Readings:**

1. Taaffe, E.J., Gauthier, H.L. & O'Kelly, M.E. (1996). Urban Transportation. In Geography of Transportation (2<sup>nd</sup> ed.) (pp. 166-192). Upper Saddle River, NJ: Prentice Hall.

2. Pickrell, D. (1999). Transportation and Land Use. In Gomez-Ibanez, J.A., Tye, W.B. & Winston, C. (Eds.), Essays in Transportation Economics and Policy (pp. 403-435). Washington, D.C.: Brookings Institution Press. Available at the course web site
3. Anderson & McCullough. Full Cost of Transportation in the Twin Cities Region. Available at <http://www.cts.umn.edu/trg/publications/pdfreport/TRGrpt5.pdf>

### **Week 3**

- **Topic:**

1. Transportation and Land Use
2. Smart Growth

- **Required Readings:**

1. Giuliano, G. (2004). "Land Use Impacts of Transportation Investments - Highway and Transit". In Hanson, S. (Eds.), The Geography of Urban Transportation (3<sup>rd</sup> ed.) (pp. 237-273). New York: The Guilford Press. Available at the course web site
2. Downs, A. "Smart Growth". *Journal of the American Planning Association*, Vol. 71, No. 4, Autumn 2005. pp. 367-380 Available at the course web site
3. Bochner, B.S. (2000). Smart Growth Tools for Transportation. *ITE Journal*, 77 (11), 26-29. Available at the course web site. Available at the course web site.
4. Talen, E. & Knaap, G. (2003). Legalizing Smart Growth: An Empirical Study of Land Use Regulation in Illinois. *Journal of Planning Education and Research*. 22 (4). 345-359. Available at the course web site.

- **Suggested Readings:**

1. Skaburskis, A. (2006) "New Urbanism and Sprawl". *Journal of Planning Education and Research* 25: pp. 233-248 Available at the course web site
2. Rodriguez, D.A., A. J. Khattak, and K. R. Evenson (2006) "Can New Urbanism Encourage Physical Activity?", *Journal of the American Planning Association*, Vol. 71. No. 1, Winter 2006. pp. 43-54. Available at the course web site
3. Handy, S., X. Cao, and P. L. Mokhtarian. (2006) "Self-Selection in the Relationship between the Built Environment and Walking". *Journal of the American Planning Association*, Vol. 71. No. 1, Winter 2006. pp. 55-74. Available at the course web site
4. Cervero, R. and K. Kockelman. Travel Demand and the 3Ds: Density, Diversity, and Design. (1997). *Transportation Research D. Vol 2:3*. pp 199-219. Available at the course web site

### **Week 4**

- **Topic:**

Early Transportation

- **Required Readings:**

1. Taaffe, E.J., Gauthier, H.L. & O'Kelly, M.E. (1996). The Evolution of the U.S. Transportation System I & II. In Geography of Transportation (2<sup>nd</sup> ed.) (pp. 73-142). Upper Saddle River, NJ: Prentice Hall. Available at the course web site

## Week 5

- **Topic:**  
Birth of Modern Transportation Planning
- **Required Readings**
  1. Myer, M.D. & Miller, E.J. (2001). Urban Transportation Planning: Definition and Context. In Urban Transportation Planning (2<sup>nd</sup> Ed.) (pp. 1-40). New York: McGraw Hill.
  2. Walters, J. (2002, May). The TEA Generation. Governing. Available at the course web site.
- **Suggested Reading:**
  1. Transportation Mode, Available at <http://people.hofstra.edu/geotrans/eng/ch3en/ch3menu.html>
  2. Weiner, E. (1997). Urban Transportation Planning in the United States: An Historical Overview (5<sup>th</sup> ed.). U.S. Department of Transportation, Federal Highway Administration. Available at <http://tmip.fhwa.dot.gov/clearinghouse/docs/utp/>

## Week 6

- **Topic:**  
Data Needs and Collection
- **Required Readings:**
  1. Gayle, S. (1999). Urban Transportation Studies. In Edwards, J. (Eds.), Transportation Planning Handbook (pp. 394-426). Washington, D.C.: Institute of Transportation Engineers. Available at the course web site
  2. Levinson, H.S. & Jurasin, R. P. (1999). Transportation Planning Studies. In Desards, J. (Eds.), Transportation Planning Handbook (pp. 95-153). Washington, D.C.: Institute of Transportation Engineers. Available at the course web site

## Week 7

- **Topic:**
  - Simple demand analysis
  - Demand analysis - trip generation
- **Required Readings:**
  1. Myer, M.D. & Miller, E.J. (2001). Demand Analysis. In Urban Transportation Planning (2<sup>nd</sup> Ed.) (pp. 247-331). New York: McGraw Hill. Available at the course web site
  2. Mitchelson, R.L. & Wheeler, J.O. Analysis of Aggregate Flows: The Atlanta Case. In Hanson, S. (Eds.), The Geography of Urban Transportation (2<sup>nd</sup> ed.) (pp. 129-165). New York: The Guilford Press. Available at the course web site
- **Suggested Reading for advanced students:**
  1. Bhat, C.R. & Koppelman, F.S. (1999). Activity-based Modeling of Travel Demand. In Hall, R.H. (Eds.), Handbook of Transportation Science (pp.35-61). Boston, Mass: Kluwer Academic Publishers.

## Week 8

- **Topic:**

Demand Analysis – Trip Distribution

- **Required Readings: Same as above plus class handouts**

### Week 9

- **Topic:**

Demand Analysis – Mode Choice

- **Required Readings: Same as above plus class handouts**

### Week 10

- **Topic:**

1. Demand Analysis – Trip Assignment
2. Demand Analysis – Validation and implementation

- **Required Reading: Same as above and**

Flyvbjerg, B., M. K. Skamris Holm, and S. L. Buhl. (2005) "How (In) accurate Are Demand Forecasts in Public Works Projects?" *Journal of the American Planning Association*, Vol. 71. No. 2, Spring 2005 Available at the course web site

- **Suggested Reading**

1. Barton-Aschman Associates, Inc.& Cambridge Systematics, Inc. (1997). Model Validation and Reasonableness Checking Manual. Travel Model Improvement Program (TMIP), Federal Highway Administration (FHWA), U.S. DOT. Available at <http://tmip.fhwa.dot.gov/clearinghouse/docs/mvrcm/mvrcm.pdf>

### Week 11

- **Topic:**

1. Land use modeling
2. Supply Analysis

- **Required Readings:**

1. Torrens, P.M. (2000). How Land-Use-Transportation Models Work. Center for Advanced Spatial Analysis Working Paper Series. University College London, London, UK. Available at [http://www.casa.ucl.ac.uk/how\\_lutms\\_work.pdf](http://www.casa.ucl.ac.uk/how_lutms_work.pdf)
2. Zegeer, J.D. (1999). Planning Approach to Capacity. In Edwards, J. (Eds.), Transportation Planning Handbook (pp. 207-238). Washington, D.C.: Institute of Transportation Engineers. Available at the course web site

- **Suggested Readings for advanced students:**

1. Waddell, P. UrbanSim: Modeling Urban Development for Land Use, Transportation and Environmental Planning. *Journal of American Planning Association*, Vol. 68 No. 3, Summer 2002, pp. 297-314. Available at the course web site
2. Pradhan, A., and K. Kockelman . Uncertainty Propagation in an Integrated Land Use-Transportation Modeling Framework: Output Variation via UrbanSim. *Proceedings of Transportation Research Board Annual Meeting*. Washington, D.C. January 2002. Available at the course web site

3. Ben-Akiva, M., and J. Bowman. Integration of an Activity-based Model System and a Residential Location Model. *Urban Studies*, Vol. 35, No. 7, pp. 1131-1153, 1998 Available at the course web site

### Week 12

- **Topic:**

Environmental Impacts and sustainability

- **Required Readings:**

1. Bae, C. C. (2004). "Transportation and the Environment". In Hanson, S. (Eds.), The Geography of Urban Transportation (3<sup>rd</sup> ed.) (pp. 356-381). New York: The Guilford Press. Available at the course web site
2. Deakin, E. (2002) "Sustainable Transportation: U.S. Dilemmas and European Experiences". Transportation Research Record 1792. TRB. Washington D.C. Available at the course web site
3. Kennedy, C. (2002) "A comparison of the sustainability of public and private transportation systems: Study of the Greater Toronto Area". Transportation 29: Kluwer Academic Publishers. pp. 459-493 Available at the course web site

- **Suggested readings:**

1. Schade, W. and W. Rothengatter. (2001) "Strategic Sustainability Analysis: Broadening Existing Assessment Approaches for Transport Policies". Transportation Research Record 1756. TRB. Washington D.C. Available at the course web site
2. Mindali, O. A. Raveh, and I. Salomon. (2004) "Urban Density and Energy Consumption: a New Look at Old Statistics". Transportation Research Part A. Vol. 38. pp. 143-162 Available at the course web site.

### Week 13

- **Topic:**

Transportation System Management

- **Required Readings:**

1. Meyer, M.C. (1999). Demand Management as an Element of Transportation Policy: Using Carrots and Sticks to Influence Travel Behavior. Transportation Research, Part A, 33 (7/8), 579-599. Available at the course web site.
2. Wachs, M. (1993). Learning from Los Angeles: Transport, Urban Form, and Air Quality. Transportation, 20, 329-354. Available at the course web site.
3. Giuliano, G., and S. Hanson (2004). "Managing the Auto". In Hanson, S. (Eds.), The Geography of Urban Transportation (3<sup>rd</sup> ed.) (pp. 382-403). New York: The Guilford Press. Available at the course web site

### Week 14

- **Topic:**

Transit Planning

- **Required Readings:**

1. Kain, J.F. (1999). The Urban Transportation Problem: A reexamination and Update. In Gomez-Ibanez, J.A., Tye, W.B. & Winston, C. (Eds.), Essays in

- Transportation Economics and Policy (pp. 359-401). Washington, D.C.: Brookings Institution Press Available at the course web site.
2. Kain, J.F. & Liu, Z. (1999). Secrets of Success: Assessing the Large Increases in Transit Ridership Achieved by Houston and San Diego Transit Providers. Transportation Research, Part A, 33 (7/8), 601-624. Available at the course web site.
- **Suggested Reading:**  
Larwin, T.F. (1999). Urban Transit. In Edwards, J. (Eds.), Transportation Planning Handbook (pp. 427-498). Washington, D.C.: Institute of Transportation Engineers.

## **Week 15**

- **Topic:**  
Urban Design and Transportation – Parking, Traffic Management, Street Design
- **Required Readings:**
  1. Smith, M, (1999). Parking. In Edwards, J. (Eds.), Transportation Planning Handbook (pp. 499-559). Washington, D.C.: Institute of Transportation Engineers. Available at the course web site.
  2. Southworth, M. & Ben-Joseph, E. (1995). Street Standards and the Shaping of Suburbia. Journal of the American Planning Association, 61 (1), 65-81 Available at the course web site.
  3. Atkins, C. (1999). Traffic Calming. In Edwards, J. (Eds.), Transportation Planning Handbook (pp. 642-675). Washington, D.C.: Institute of Transportation Engineers. Available at the course web site.
- **Suggested Reading:**  
Federal Highway Administration, U.S. DOT. (2004). Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, Revision 1. Available at <http://mutcd.fhwa.dot.gov/pdfs/2003r1/pdf-index.htm>