

Course:**GCU 442/598: Geographical Analysis of Transportation
Fall Semester, 2010****Schedule Line #:** 84934 (GCU 442) 86712 (GCU 598)**Credit Hours:** 3**Time:** Tues-Thurs, 10:30 –11:45 AM**Location:** Room: Manzanita Hall 001**Professor:** **Dr. Michael Kuby, Professor**
Coor 5568, Phone: 965-6850
email: mikekuby@asu.edu
<http://geoplan.asu.edu/kuby>**Office Hours:** Tuesdays 1-3 PM, Fridays 10- noon AM or by appointment**Required Readings:** Hanson, Susan and Genevieve Giuliano (eds). 2004. *The Geography of Urban Transportation*, Third Edition. New York: Guilford Publications.Gilbert, Richard and Anthony Perl. 2010. *Transport Revolutions: Moving People and Freight Without Oil* (revised and updated edition). Gabriola Island, BC Canada: New Society Publishers.

A selection of journal articles and book chapters are also required. See below for purchasing/downloading details.

Course Summary. This course examines the geographical aspects of transportation systems. It looks at the geography of networks, transport costs and rates, different modes of transport, trade, economic development, and technology. We will study the movement of freight and passengers at the individual, urban, national, and international scales. We will focus especially on air transport, transit, and energy.

Transportation geography has two themes. The first is transportation and spatial organization. This includes both how transportation is organized geographically, and how transportation organizes other human activities. Examples of the spatial organization of transportation include networks, corridors, hierarchies, hinterlands, intermodal connections, and so on. Examples of the spatial aspects of human society and economy that transportation helps to organize are land use patterns, industrial location, urban hierarchies, information flows, shopping, regional development, and trade. We will study the different approaches are used to describe and explain transportation and spatial organization, including conceptual, graphical, historical, and empirical. Each of these approaches are, in their own way, attempts to tell a story about the changing spatial patterns of transportation.

The second theme of transportation geography is applied real-world problem-solving. The approach is quantitative and overlaps with the disciplines of planning and engineering. Our goal will be to understand these models at the conceptual level and the introductory mathematical level. At the “conceptual” level, you will be expected to know about each model’s purpose, its inputs and outputs, and its assumptions, strengths, and limitations. At the “introductory mathematical” level, you will be expected to know what the parameters and variables stand for, and why its “functional form” makes sense.

Learning Outcomes. After taking this class, students should be able to:

- Understand and explain the main concepts and theories in transport geography, such as time-space convergence, location theory, hinterlands, network development, international trade, transport demand management, and the relationships between transport and land use.
- Use transport cost terminology properly.
- Know the advantages and disadvantages of each mode of transport for moving freight and passengers.
- Discuss how transport has evolved historically, the effects transport developments have had on the spatial economy and other societal issues, and the role of technology, economics, and policy on transport history.
- Understand the steps in the basic four-step urban transportation modeling system, as well as its strengths and weaknesses and alternatives.
- Assess the prospects for mass transit by understanding the factors that contribute to its success.
- Discuss the sustainability of different transport systems and modes and the energy use and environmental impacts.
- Understand how GIS can be used in transportation analysis, and be able to perform some basic GIS-T analyses.
- Use spreadsheets for computation of Gini coefficients for traffic concentration.
- Statistically estimate the coefficients of a gravity model, and be able to apply a gravity model to predicting flow volumes.
- Use linear programming to solve a basic problem to minimize transport costs.

Class Attendance and Participation. Students are expected to come to class having read the readings and be prepared to lead discussions and answer questions about the readings.

Pop Quizzes. There will be four short pop quizzes on the readings. I will automatically drop the worst one at the end of the semester.

Readings. You are expected to read all the chapters and articles and come to class ready to discuss them. In addition to the two books, there are a number of supplemental readings from other sources. All of the supplemental readings are available from the Library Resources section of the Blackboard site for free. In addition, most of them can also be purchased from Alphagraphics if you would like to buy them all at once and not be bothered with printing each one. Alphagraphics is at 815 W. University (at Hardy) – phone number 480-968-7821. It's actually cheaper to purchase them from Alphagraphics for \$23.75 (incl. tax) than to print them yourself, factoring in the ink cartridges and the savings from double-sided printing, not to mention the convenience. But the choice is yours. You can also order them online from www.agonuniversity.com to be shipped to your home via UPS (at additional cost).

Homework Exercises. The course includes four hands-on computer exercises. I will demo the steps in class, and you will complete them at home. One lab will be a group project. No previous modeling, programming, or GIS experience is assumed beyond basic computer literacy. There will also be a group presentation on a case study from transport history.

Term Paper. Graduate students are required to write a term paper on a topic of their choice. Topics must be approved by me in advance. Guidelines will be handed out a few weeks into the semester. Minimum length is 10 pages. Grad students will make short oral presentations of their findings during the last week of the semester.

Exams. There will be one midterm exam and one final exam. The final exam will be cumulative for the semester, with an emphasis on the second half. Make-up exams will be allowed only if the student has approved it with me in advance of the test. If you can't reach me by phone, you can e-mail me or call the School of Geographical Sciences

and Urban Planning office (965-7533). I will require confirmation of your excuse via valid written proof (e.g., doctor's note or receipt, copy of traffic ticket, funeral announcement, etc.).

Grades.

Your final grade is based on a weighted average as follows:

	Undergrads	Grad Students
Pop quizzes on readings (will drop lowest score)	3 x 3% = 9%	3 x 2.67% = 8%
Transport history case study group presentation	5%	n.a.
4 Homework Exercises	4 x 9%=36%	4 x 8%=32%
Term Paper	n.a.	20%
1 Midterm Exam	25%	20%
1 Final Exam	25%	20%
TOTAL	100%	100%

Class Schedule. Dates are tentative and subject to change as necessary.

Week	Date	Topic	Required Readings (please have it read for the class indicated) Also Project Due Dates
0	Thurs. Aug. 19	Course Overview Introduction to Transportation Geography	
1	Tues. Aug 24	Background and History of Transportation	<ul style="list-style-type: none"> • Hanson & Giuliano: Chs. 1-2 • Gilbert & Perl: Chs. 1-2 • Black: Ch. 2
	Thurs. Aug. 26	Background and History of Transportation	
2	Tues. Aug. 31	Transportation Costs	<ul style="list-style-type: none"> • Kuby Powerpoint • Hanson & Giuliano: Ch. 11; Ch. 12, pp. 332-345.
	Thurs. Sept. 2	Transportation Costs and Financing	<ul style="list-style-type: none"> • Duvall (2010)
3	Tues. Sept. 7	Transport historical geography group presentations	<ul style="list-style-type: none"> • Group project: present a brief case study from U.S. transportation history (see handout)
	Thurs. Sept. 9	Air Transport: Deregulation and Hubs	<ul style="list-style-type: none"> • Reynolds-Faighan (1998) • Button (2002) • Goetz and Vowles (2009) • Tierney and Kuby (2009)
4	Tues. Sept. 14	Air Transport: Deregulation and Hubs	
	Thurs. Sept. 16	Gini Coefficient Lab Demo	
5	Tues. Sept. 21	Transportation Networks	<ul style="list-style-type: none"> • Kuby, Roberts, Upchurch, Tierney (2009)
	Thurs. Sept. 23	GIS for Transportation (GIS-T) Lab Demo	<ul style="list-style-type: none"> • Gini Coefficient Exercise Due • Hanson & Giuliano: Ch. 7 • Rodrigue, Ch. 1: Route Selection Models
6	Tues. Sept. 28	GIS-T	<ul style="list-style-type: none"> • GIS-T Exercise Due
	Thurs. Sept. 30	Economic Geography	<ul style="list-style-type: none"> • Taaffe, Gauthier & O’Kelly: Ch. 2 • Kuby Powerpoint

Week	Date	Topic	Required Readings (please have it read for the class indicated) Also Project Due Dates
7	Tues. Oct. 5	Economic Geography Trade Theory	
	Thurs. Oct. 7	Trade Theory	
8	Tues. Oct. 12	Midterm Exam	
	Thurs. Oct. 14	Film: Phoenix: The Urban Desert	
9	Tues. Oct. 19	Transport Optimization Models	<ul style="list-style-type: none"> • Linear Programming Handout (grad and undergrad) • Taaffe, Gauthier, & O'Kelly: Ch. 10 (grad only)
	Thurs. Oct. 21	Transport Optimization Lab Demo	
10	Tues. Oct. 26	Urban Transportation and Urban Form	<ul style="list-style-type: none"> • Hanson & Giuliano: Ch. 3 • Hanson & Giuliano: Ch. 8 • Hanson & Giuliano: Ch. 9
	Thurs. Oct. 28	Urban Transportation and Urban Form	<ul style="list-style-type: none"> • Optimization Lab Due
11	Tues. Nov. 2	Urban Transportation Planning 4-Step Modeling	<ul style="list-style-type: none"> • Hanson & Giuliano: Ch. 5 • Hanson & Giuliano: Ch. 6
	Thurs. Nov. 4	Trip Generation Models Trip Distribution Models	<ul style="list-style-type: none"> • Taaffe, Gauthier&O'Kelly: Ch. 7 (grad and undergrad) • Taaffe, Gauthier&O'Kelly: Ch. 11 (grad only)
12	Tues. Nov. 9	Film: Portland: Quest for the Livable City	
	Thurs. Nov. 11	Veterans Day	All ASU Classes Cancelled
13	Tues. Nov. 16	Gravity Model Lab Demo	
	Thurs. Nov. 18	Modal Split Traffic Assignment	
14	Tues. Nov. 23	Critiques of, and Alternatives to, 4-Step Modeling	<ul style="list-style-type: none"> • Gravity Model Lab Due
	Thurs. Nov. 25	Thanksgiving	All ASU Classes Cancelled
15	Tues. Nov. 30	Transport, Energy, and the Environment	<ul style="list-style-type: none"> • Hanson & Giuliano: Ch. 10 • Gilbert & Perl: Ch. 3
	Thurs. Dec. 2	Transport, Energy, and the Environment	<ul style="list-style-type: none"> • Hanson & Giuliano: Ch. 13 • Gilbert & Perl: Ch. 4
16	Tues. Dec. 7	Transport, Energy, and the Environment	<ul style="list-style-type: none"> • Gilbert & Perl: Chs. 5-6 • Hanson & Giuliano: Ch. 14
	Wed. Dec. 8	READING DAY	<ul style="list-style-type: none"> • Grad Student Term Papers Due
	Tues. Dec. 14 9:50-11:40 AM		<ul style="list-style-type: none"> • Final Exam

Required Supplemental Readings

**Available from Alphagraphics, 815 W. University (at Hardy) –480-968-7821 –
www.agonuniversity.com (printed and bound for \$23.75 including tax) or downloadable from
Library Resources in Blackboard.**

Black, William. 2003. *Transportation: A Geographical Analysis*. New York: Guilford Press. (Chapter 2 only)

Button, Kenneth 2002. Debunking some common myths about airport hubs. *Journal of Air Transport Management* 8: 177-188.

Duvall, Tyler. 2010. Unclogging transportation. *National Affairs* 3: 87-102 (Spring 2010).

Goetz, Andrew and Timothy M. Vowles. 2009. The good, the bad, and the ugly: 30 years of U.S. airline deregulation. *Journal of Transport Geography* 17: 251-263.

Kuby Michael J., Tyler D. Roberts, Christopher D. Upchurch, Sean Tierney. 2009. Network Analysis. In Kitchin R, Thrift N (eds) *International Encyclopedia of Human Geography*, Volume 7, pp. 391-398. Oxford: Elsevier.

Reynolds-Feighan, Aisling J. 1998. The impact of U.S. airline deregulation on airport traffic patterns. *Geographical Analysis* 30(3): 234-253.

Taaffe, Edward J., Howard L. Gauthier, and Morton E. O’Kelly. 1996. *Geography of Transportation* (2nd. ed.). Saddle River, NJ: Prentice-Hall. (Chapters 2 and 7 only)

Tierney, Sean, and Michael Kuby. 2008. Airline and Airport Choice by Passengers in Multi-Airport Regions: The Effect of Southwest Airlines. *Professional Geographer* 60(1): 15–32.

Available via Library Resources in Blackboard or just type the URL into your browser

Rodrigue, J-P *et al.* 2003. *Transport Geography on the Web*, Hofstra University, Department of Economics & Geography, <http://people.hofstra.edu/geotrans>.

Section on GIS-T:

<http://people.hofstra.edu/geotrans/eng/ch1en/meth1en/ch1m4en.html>

Section on route selection models:

http://people.hofstra.edu/geotrans/eng/ch2en/meth2en/ch2m2en_2ed.html