SYLLABUS

WWS 527a
Transportation Policy Analysis and Systems Planning

v1.1

Fall 2007/2008

Professor Alain L Kornhauser	Class Hours: Tue. & Thurs. 2:40 - 4:10 p.m. Location: 010 Robertson Hall
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Course Requirements:	**% of final grade**
bi-weekly assignments	30%
"tenth - week" exams	30%
Term project due at end of Reading Period	30%
Class participation	10%

Course Description

Studied is the transportation sector of the economy from a broad public policy perspective with an emphasis on technology. The focus is on the modeling and methodologies that underpin the policy formulation, capital and operations planning, and real-time operational decision making within the transportation industry. With shifting national priorities, the public sector role in transportation continues to change significantly. The heightened sensitivity of security, climate change and energy create substantial challenges. Social and market forces play a much bigger role in shaping public policy in transportation. Radical concepts such as "value" pricing, private toll roads and for-profit mass transportation are now seriously considered as central elements of a broad transportation policy. Meanwhile, local issues of traffic congestion, road construction and transportation-related environmental issues are dominant themes of grass roots politics.

The first part of the course, "policy, planning and decision making", surveys the transportation sector of the economy by studying and evaluating the current change in the balance between Federal, regional and local transportation agencies, private transportation providers, consumers of transportation and those impacted by transportation. Studied are the roles played by each of the participants in the transportation sector of the economy. The historical evolution of transportation policy will provide a perspective for evaluating current proposals for a reorientation of transportation priorities.

The second part of the course, "tools and technology", focuses on the quantitative aspects of transportation design, planning and analysis. Studied are the methodologies used in the transportation planning process: its objective, its models and its data requirements. Focus will be on methodologies of the planning process that are appropriate for addressing broad national policy issues as well as detailed and specific local circulation and traffic issues. These methodologies will be applied to the design of a new State-wide mass transit system for New Jersey. Each student will be responsible for the design and analysis of the mass transit system for at least one county. The class will work together to create a unified synergistic system for the entire state. Work on the system will evolve throughout the semester. Interim results and findings will be presented at two interim workshops. A Final workshop, presenting final recommendations, will take place at the end of Reading Period.

The third part of the course, "technologies", focuses on the users of transportation and how emerging technologies may improve the way that we use transportation. Studied are the various elements of intelligent transportation systems (ITS) that apply advanced communications, computation and control systems. The introduction of many of these systems is in response to improved service demanded by the shippers and travelers. Studied will be advanced traveler information systems and advanced transportation management.

The final part of the course, "current transportation policy issues", investigates three policy issues having significant local, regional and national transportation policy implications:

a) “Paying for Access” (the Manhattan Congestion Zone),
b) “The Arts versus Mass Transit” (Moving the Dinky to make room for the new University Arts Center), and
c) “Privatizing the Cash Cow (aka New Jersey Turnpike) ”

Course requirements include weekly readings, bi-weekly assignments, one “tenth week” exam, a term project and class participation. Two (2) 80 minute classes. We’ll also visit some transportation facilities in the metropolitan area and have several distinguished practitioners come speak with us.

Textbook: ***Reference Textbooks:***
Gomez-Ibañez, et al (Eds.). (1999) Essays in Transportation Economics and Policy –A Handbook in honor of John R. Meyer. Washington DC: Brookings Institution Press. Available on a page by page basis at: http://brookings.nap.edu/books/0815731817/html/
Meyer, M. D., & Miller, E. J. (M&M) *Urban Transportation Planning, A Decision-Oriented Approach, 2nd ed*. McGraw-Hill, 2001, ISBN 0-07-242332-3

Other References: .
Proceedings of the ITS America 2005 Annual Meeting, May, 2005
Ran, B., Boyce, D. *Dynamic Urban Transportation Network Models*, Lecture Notes in Economics & Mathematical Systems, #417, Springer-Verlag

Oppenheim, N. *Urban Travel Demand Modeling*, Wiley, 1995, ISBN 0-471-55723-4
http://www.bts.gov/ US Transportation Statistics
http://www.fhwa.dot.gov/tea21/index.htm Current Federal Transportation Legislation
http://www.fhwa.dot.gov/trafficinfo/index.htm#TRFF National traffic & road closure

Part 1. Perspective on the Transportation Sector of the Economy: Its Function, Its Players, Its Technologies, Its Policies, Its Information Sources

Week 1
Mon Sep17
Introduction and Survey of Course
Elements of the transportation sector of the economy, the player, the technologies, the information sources
Reading:
http://www.bts.gov/publications/pocket_guide_to_transportation/2005/pdf/entire.pdf
The Changing Face of Transportation USDOT National Transport Statistics (Continuously updated)
Class Notes: Week 1

Wed Sep 19
Historical evolution of National Transportation Policy
Readings: Coyle Ch. 1-4, pp. 2-129 (passed out); *Brief History of US DOT*
http://isweb.tasc.dot.gov/Historian/history.htm
Homework 1: The Last Drop

Week 2
Mon Sep 24
Current National Transportation Policy and the FY07Budget Proposal for Transportation; Highway taxes; Central Jersey Rapid Transit Project BRT Project RFP-04-01
Homework 2: The Value of a Life, Due Wed. Sep 26.

Reading: FY2006 Federal Budget ; FY2005 Federal Transportation Budget; The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), governs fiscal years 2004 through 2009. The legislation For 2005 to 2009, highway spending limits total $189.48 billion, and public transportation funding totals $45.31 billion. Public transportation spending equals 18.5 percent of the bill's overall funding. Summary of Highway provisions

Wed Sep 26
Big Picture view of Transportation in the next 20-25 years (be prepared to discuss!)

The Private Sector side of Transportation. Carriers, shippers 3rd party logistics, and other service provides
Background reference: links to trucking industry: Trucking/Carriers:
http://www.truckline.com/, http://etrucker.com, http://www.truckinginfo.com/,
http://truklink.com/, http://www.truckload.org/ Logistics/Shipper:

http://www.logisticsmgmt.com, http://www.totalsupplychain.com, http://www.trafficworld.com/, http://inboundlogistics.com/index.shtml, http://logistar2.com/ (For software vendor research), http://www.pcmiler.com/news/industry/default.html

Homework #2 &#3 Alternatives Analysis Student Teams

Part 2. Planning and Analysis Tools of Transportation Demand and Investment

Week 3

Mon Oct 1
Development of a Formal Urban Transportation Planning (UTP) Process & Decision Making: The Central Jersey Transit Study
Ref.: *Class Notes* also: Millstone Bypass
Background reference: M&M, Ch 2 Planning & Decision Making

Wed Oct 3
Urban Travel & Transportation System Characteristics: Planning Studies and Methods: Travel Demand Surveys, Data Sources, Intro to Sequential Demand Forecasting Modeling Approaches
Background reference: M&M, Ch 3

Week 4
Mon Oct 8
Alternatives Analysis: Goals, Objectives, Metropolitan Planning Processes
Readings:
Background reference: M&M, Ch 4 Data Management & Use in Decision Making

Wed Oct 10
Alternatives Analysis: Land Use Models
Background reference: M&M , Ch. 5.0 – 5.3
Notes **News:** End of Line for Dinky?

Week 5
Mon Oct 15
Alternatives Analysis: Demand Forecasts: Land Use Models and Trip Generation
Ref.: Puget Sound Study, Broad, New York Met Area Study, North Carolina Study , Travel modeling Urban Goods Movement Model UGMM ; **Class Notes Background reference:** M&M , Ch. 5.0 – 5.3 Handout of ITE Trip Generation chapter, Ch. 5.4.1 Handout, reference on matrix manipulations in Excel **Ref.:** Class Notes

Assignment: Homework #5. My City. Examples: MyCityEx1, MyCityEx2 Due: Wed. Oct 19 & Mon Nov7.

Wed Oct 17
Modeling Trip Distribution and Mode Split for State-wide transit system
Assignment: Layout, generate trips for the Central Jersey Transit Study
Ref.: Class Notes, **Background reference:** M&M , Ch. 5.4.2**Ref.:**

Week 6
Mon Oct 22
Paths through networks; Network Analysis: Shortest Paths: Label Setting and Label Correcting, Shortest paths in Real Networks and Essentially Shortest Paths
Readings: Ch. 5.4.3-6, Magnanti, Ch4, Ch5 Zhan & Noon, "Shortest Path Algorithm : An Evaluation using Real Road Networks"; Kornhauser & Hunt, "Essentially Shortest Paths"; White & Kornhauser "Princeton Dynamic traffic Assignment Model"

Wed Oct 24
Traffic Assignment
Readings: Kornhauser & Hunt, "Essentially Shortest Paths"; White & Kornhauser "Princeton Dynamic traffic Assignment Model"

Term Break Oct 28- Nov 3

Part 3 The Role of High Technology in Transportation

Week 7
Mon Nov 5 and Wed Nov 9
Intelligent Transportation Systems (ITS): Advanced Traveler Information Systems (ATIS):
In-vehicle Satellite Navigation: From TravTek to Navigation Based Services; Global Positioning Systems (GPS)
Readings: Next Steps in "Advanced Traveler Information Systems"

Week 8
Mon Nov 12 and Wed Nov 14
Personal Rapid Transit, "Transport System of the Future???" History of PRT. A Look at "Radical" Transit Alternatives: Supply Role of Automation in Public Transportation Systems; Recent Developments in Automated People Movers and Personal Rapid Transit Systems. Study of the Newark Airport and Anderson's Taxi 2000
Readings: NJ DoT PRT Exec Presentation; Jerry Schneider's Source Page, **Skyweb Express (aka Taxi2000),** History of PRT, Jerry Schneider's Source Page, **Taxi2000**

Week 9
Mon Nov 21
"Value Pricing", other pricing policies in transportation.
Readings: Fehlig, M, Kornhauser, A. "Marketable Permits for Peak Hour Congestion on Rt 1" TRB,
Assignment: Final Project Description

Wed Nov 23
The London Congestion Zone and implications on NYC
Readings: London Congestion Zone

Part 4 Current High Profile Transportation Policy & planning Issues

Week 10
Mon Nov 26 and Wed Nov 28
"Paying for Access" (the Manhattan Congestion Zone)
Readings: To be distributed
Assignment:

Exam: Thursday Nov 29**(Distributed by Email)**

Exam covering weeks 1-9 Instructions

Week 11
Mon Dec 5 and Wed Dec 7
"The Arts versus Mass Transit" (Moving the Dinky to make room for the new University Arts Center)
Readings: To be distributed
Assignment:

Week 12
Mon Dec 14 and **Wed Dec 16**
"Privatizing the Cash Cow (aka New Jersey Turnpike)"
Readings: To be distributed
Assignment:

Reading Period 10:00 am - 1:00pm Tuesday Jan 10, Final Workshop on Term Project; Lunch will be served. Schedule