

Orf 467
Transportation Systems Planning and Analysis v1.2

Fall 2009/2010

[Course Description](#)

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

Week 1

Mon Sep 21

Introduction and Survey of Course

Elements of the transportation sector of the economy, the player, the technologies, the information sources

Reading: Basic background on Transportation in the US:

http://www.bts.gov/publications/pocket_guide_to_transportation/2009/pdf/entire.pdf

Trends in Personal Income and Travel miles:

http://www.bts.gov/publications/bts_special_report/2007_10_03/pdf/entire.pdf

Energy Flow Diagram: http://www.eia.doe.gov/emew/aer/pdf/pages/sec1_3.pdf

National Transportation Statistics:

http://www.bts.gov/publications/national_transportation_statistics/2008/pdf/entire.pdf

[Recent Traffic Volume Trends](#)

[Highway Statistics Publication Archive](#)

Wed Sep 23

Historical evolution of National Transportation Policy leading to current National Transportation Policy,

[Highway taxes](#); [Stateline.org Article](#)

Readings: [Brief History of US DOT](#)

Homework 1: [The Last Drop](#) ; Due Mon Sep 28

[Class Notes: Week 1](#)

Week 2

Mon Sep 28

Evolution of Urban transportation Technology: From the Omnibus to PRT

Class [Notes \(History Slides\)](#)

Wed Sep 30

Big Picture view of Transportation in the next 20-25 years ([be prepared to discuss](#) this link!) 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 PRT Legislative Study](#); [NJ PRT Legislative Exec Presentation](#), NJ PRT [Academic Look](#), [Jerry Schneider’s Source Page](#), [Skyweb Express \(aka Taxi2000\)](#), [History of PRT](#)

More Links on PRT: Uppsala [Conference](#); Daventry [Conference](#), Vectus [PRT](#) , [PRT for Sodertalje](#)

Class [Notes \(PodcarPaper\)](#)

Term Assignment: New Jersey State-wide PRT Network Design: [Assignment](#) v1, [Teams](#)

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

Week 3

Mon Oct 5

Development of a Formal Urban Transportation Planning (UTP) Process & Decision Making: The Central Jersey Transit Study ; Alternatives Analysis: Goals, Objectives, Metropolitan Planning Processes

Ref.: [Class Notes](#) [Planning Charts](#)

Background reference: Ed Weiner, [Urban Transportation Planning In the United States: An Historical Overview: Fifth Edition](#) especially Ch 3 [3-C Urban Travel Forecasting Process](#), Ch 5 [Continuing Transportation Planning](#) ; Ch 10 [ITE trip Generation Report](#) Ch 13, especially: [Met and Statewide Planning Regs](#) , [Transportation Management Systems](#),

Wed Oct 7

Urban Travel & Transportation System Characteristics: Planning Studies and Methods: Travel Demand Surveys, Data Sources, Intro to Sequential Demand Forecasting Modeling Approaches

Background & Data Reference: [TCRP B-15 Characteristics of Urban Travel](#) see especially: [Overall Trip Rates](#)

Homework #2a,b [My City](#) Examples: [MyCityEx1](#), [MyCityEx2](#), [CityOfEden](#), [CofEReport](#) Due: Before class on: Wed. Oct 14 & Wed Oct 21.

Week 4

Mon Oct 12

Relating the demand for transportation with Land Use: Trip generation

Ref.: Puget Sound Study, Broad, New York Met Area Study, North Carolina Study , (see Notes for links) Travel Modeling [Urban Goods Movement Model UGMM](#) ;

Class Notes [Notes](#)

Wed Oct 14

Relating the demand for transportation with Land Use: Trip distribution

Ref.:

Class Notes: [Notes](#) **Trip distribution**

Ref.: [The Gravity Model](#), [Example of Trip Distribution Model](#)

Week 5

Mon Oct 19:

Modeling Trip Distribution and Mode Split for State-wide transit system

Assignment:

Ref.: **Class Notes** [Class Notes](#), **Homework #3** [Final Report for My City](#)

Wed Oct 21

Traffic Assignment and paths through networks; Network Analysis: Shortest Paths: Label Setting and Label Correcting, Shortest paths in Real Networks and Essentially Shortest Paths

Readings: Magnanti, Ch2, Ch4 (to be distributed)

Week 6

Mon Oct 26

More on: Paths through networks; Network Analysis: Shortest Paths: Label Setting and Label Correcting, Shortest paths in Real Networks and Essentially Shortest Paths

Readings: Magnanti: Ch. 2 & 4.

Ref.: [Class Notes](#)

Wed Oct 28

More on Networks: Label Setting Dijkstra's Algorithm

Readings: [DijkstraApplet](#)

Ref.: Magnanti Ch 4, especially 4.5 through 4.9 [Class Notes c](#) ; [Comparisons of Orf467F09 My Cities](#)

Term Break Oct 29- Nov 8

Week 7

Mon Nov 9

More on Networks: Dial and Radix Heap Implementations of Dijkstra's; Label Correcting; real world networks and stochastic issues

Ref.: Magnanti Ch 4, especially 4.5 through 4.9 [Class Notes c](#)

Additional Readings: He, Kornhauser & Ran, "Essentially best routes in dynamic and stochastic networks", Zhan & Noon, "Shortest Path Algorithm : An Evaluation using Real Road Networks

Assignment: Magnanti: 2.1, 2.2, 2.3, 2.4, 2.5, 2.30, 2.31, 4.1, 4.14, 4.15 (These are straight forward. Do them with your partners; turn in one solution set per two person pair.), ***Due in class Monday Nov 16.***

Part 3 The Role of High Technology in Transportation

Wed Nov 11

Intelligent Transportation Systems (ITS): Advanced Traveler Information Systems (ATIS):

In-vehicle Satellite Navigation: From TravTek to Navigation Based Services; Global Positioning Systems (GPS)

Readings: 511 Traffic <http://www.trafficland.com/>; [Bay Area South Florida](#) ; [Virginia TampaBay](#) ; [Minnesota Georgia Traffic.com](#) ; [Real-time ATIS http://www.photoenforced.com/us.html](#); <http://www.cameralert.com/>

Assignment: [Next Steps in "Advanced Traveler Information Systems"](#)

Week 8

Mon Nov 16 & Wed Nov 18

Toward Real-Time Dynamic Minimum Estimated Time of Arrival turn-by-turn route guidance

Readings: [Demers, A, et al](#) "Competing With the Ghost of ADVANCE: Experimenting with Real-Time ATIS",

Fontaine, M.D., et al, "Wireless Location Technology-Based Traffic Monitoring" Transportation Research Record No. 1993, 2007, pp. 51-58, **Class [Notes](#)**

Week 9

Mon Nov 2

Energy and transportation

Readings: NJ Energy Overview:

http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=NJ#overview

Exam: Tuesday Evening Nov 24 7:30- 8:50pm 101 ORFE Building

Exam covering weeks 1-8 [Instructions](#)

Wed Nov 25

NO CLASS (exam the previous evening)

Part 4 Current High Profile Transportation Policy & Planning Issues

Week 10

Mon Nov 30 and Wed Dec 2

Current National Transportation Policy, Transportation infrastructure and the stimulus packages, and the FY10 Budget Proposal for Transportation; [Central Jersey Rapid Transit Project](#) The Private Sector side of Transportation. Carriers, shippers 3rd party logistics, and other service providers

Big Picture view of Transportation in the next 20-25 years ([be prepared to discuss!](#))

<http://etrucker.com>, <http://www.truckinginfo.com/>, <http://truklink.com/>, <http://www.truckload.org/>

Readings: [FY2009 Federal Transportation Budget](#); The Safe, Accountable, Flexible, and 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](#)

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>

Week 11

Mon Dec 7

“Value Pricing”, other pricing policies in transportation.

Readings: [Fehlig, M, Kornhauser, A. “Marketable Permits for Peak Hour Congestion on Rt 1”](#)

RPA [Congestion Charging & Technology, 2007](#)

Zupan, J and A. Perrotta “[An Exploration of Motor Vehicle Congestion Pricing in NY” Regional plan Assoc. , 2003](#)

Ref.: [Class Notes](#)

Wed Dec 9

The London Congestion Zone and “Paying for Access” and prospects for the Manhattan Congestion Zone

Readings: [London Congestion Zone](#)

Assignment: *2nd Interim Report on NJPRT counties, Due in class Wed Dec 12*

Week 12

Mon Dec 14

“Privatizing the Cash Cow (aka New Jersey Turnpike)” & Financing Transit In NY Metropolitan area.

Readings: Derrick Leung’08 Senior Thesis: “[Unyoking the Cash Cow. Who Should Own the New Jersey Turnpike?](#)”

New Toll Proposal for East River Bridges: [Ravitch](#) and [NYT](#)

Wed Dec 16

Individual presentations of 2nd Interim Report of NJ PRT design.

Reading Period 10:00 am - 1:00pm Tuesday Jan 12, Final Workshop on Term Project; Lunch will be served. [Schedule](#)