Public transit is in an exciting and challenging new phase. Increasing energy costs are moving trips from the auto to public transit. Sustainability concerns and environmental quality issues, such as carbon offsets, “green” communities, and transit-oriented development, connect back to how we travel both today and tomorrow. Most recently, the economic downturn has affected both transit finances and ridership.

There are two primary objectives of the course. First, the course will present a broad overview of transit policy and planning issues with particular reference to the United States. We will focus on the general parameters within which transit operates in terms of financing, political support and demographics. The second objective is more specific. The course will detail the current and emerging planning and operations methods and techniques used across alternate transit modes. We will explore both conventional fixed route transit and paratransit systems, and examine technologies, applications and newer concepts, such as quality of service and the community transit system approach. The topics below will be discussed:

- Transit policy at the state and national levels
- System and route planning and operations
- Technology for transit applications
- Demand analysis
- Finance
- Paratransit and community transit systems
- Land use and transit
- Management of transit properties

The course is a seminar and the full involvement of all participants is expected.

This outline is subject to change based on the availability of guest speakers that will used throughout the semester. The guest speakers, with the exception of the September 25 lecture, are graduates of the Bloustein School and took this course as part of their studies.

Assignments and Final Project

Assignments include a set of four exercises and a final research project due at the end of the semester.

The final project will be on some aspect of transit operations, management or planning. The expected output of the project is a written professional-level report (10 to 15 pages) and a class presentation using PowerPoint. There are a range of topics and issues, many of which are local. New Jersey Transit is the statewide provider of public transit. The Rutgers University bus system is the second largest in the state. The New Brunswick region contains a complex mix of transit operations embedded in a highly congested auto-dominant network. In previous years the reports have focused on transit planning and operations in metropolitan areas in the US and in other countries. The report should focus on a particular place and/or a particular problem or issue. The paper should not be on general policymaking, concepts or reviews. A handout explaining the expectations for the paper will be distributed. Proposals for the paper will be due on October 23 and they must be approved before you proceed with your research.
Readings

A superb report prepared for the Transit Cooperative Research Program (TCRP) of the Transportation Research Board is one core resource. It is:


Sadly, the two classic books cited below are out-of-print. They have been available at times from booksellers found on Amazon and other sources.


George E. Gray and Lester A. Hoel, editors, Public Transportation, Second Edition (Englewood Cliffs, New Jersey: Prentice-Hall, 1992). This book has been archived by the US Department of Transportation Bureau of Transportation Statistics. It can be found at the following link:


There are two classes of readings:

1. Those followed by brackets [black1, etc.] for your reference if you are able to find these texts, but remember that they are not required.

2. Selected readings from TCRP (Transit Cooperative Research Program) are available on the web, as described in the attachment to this outline. These readings are highlighted in bold as R-28, etc.

Unless you are specifically instructed, the readings are not required as part of the course assignments. They are intended to provide background information. They also provide good resources for you to use in preparing your final project.

Field Trip

The field trip will be scheduled for a Friday either on September 18, September 25, October 9, or October 16. You will see actual transit operations and facilities on the field trip. The purpose of the field trip is to provide a real life picture of what we discuss in class. In the past, we have visited PATCO in South Jersey, the RiverLine, the Hudson-Bergen Light Rail line, NJ Transit’s Newark Light Rail Line, the NJ Transit Meadowlands Rail Operations and Maintenance Facility and Hoboken Terminal. A decision on what we will see this year will be made based on availability of transit operators to host us.

Grading

Your final grade will be calculated using the following percentages:

| Assignment 1: | 25% |
| Assignment 2: | 10% |
| Assignment 3: | 15% |
| Assignment 4: | 10% |
| Final Project Presentation and PowerPoint: | 10% |
| Final Project Written Report: | 30% |

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All assignments are due on the date indicated. If they are turned in late, they are subject to a reduction in of up to 10% in the grade value. If you have an absence on the day the assignment is due and such absence has been properly noted through the absence reporting website, the assignment will not be considered late provided it is turned in by the following class regardless of whether an additional week’s absence occurs.

Office Hours

My office hours are by appointment at 120 Albany Street, Tower 2 Suite 250. Please contact me via email (plarrous@ejb.rutgers.edu) or phone (732-932-6641) to schedule an appointment. Please note that my travel requirements for NTI require flexibility when scheduling an appointment, so plan ahead.

Academic Integrity

The Rutgers University policy regarding academic integrity applies to this course. Consult the following web site for more information:

http://academicintegrity.rutgers.edu/integrity.shtml#I

Attendance Policy

Students are expected to attend all classes; if you expect to miss class, please use the University absence reporting website:

https://sims.rutgers.edu/ssra/

You will indicate the date and reason for your absence. An email is automatically sent to me.

Please note: My policy for classes is that you are expected to obtain any information, notes, etc. that are necessary to complete any assignments in a timely manner. If you miss class and an assignment is due, it must be turned in the next class upon your return. Failure to follow these standards may result in a lower grade being given to the assignment. Also, if you miss a large number of classes that it affects your ability to complete your assignments independently, your grade may be lowered.
Course Outline

Sept 3

**Introduction**


Ch. 1—Smerk, Public transportation and the city
Ch. 2 – Saltzman, Public transportation in the 20th century
Ch. 3 – Weiner, History of urban transportation planning

Sept 10

**Transit in North America**

*Transit Capacity and Quality of Service Manual, Third Edition*

R-28: Transit Markets of the Future: The Challenge of Change
R-62: Improving Public transportation access to Large Airports
R-122: Understanding How to Motivate Communities to Support and Ride Public Transportation
R-123: Understanding How Individuals Make Travel and Location Decisions: Implications for Public Transportation
R-166: Characteristics of Premium Transit Services that Affect Choice of Mode
R-257: Making Transit Work

Sept 17

**Bus mode: capacity, system and route planning**

*Transit Capacity and Quality of Service Manual, Third Edition*

Black, Ch. 8 - Planning transit networks [Black8]
Black, Ch. 9 - Operations and management [Black9]

Gray & Hoel, Ch. 6 – Koski, Bus transit [GH chapt6]

Canadian Transit Handbook, Ch. 6 – Service design [Canadiantrans6]
Canadian Transit Handbook, Ch. 8 – Customer access [Canadiantrans8]

R-19: Guidelines for Location and Design of Bus Stops
R-26: Operational Analysis of Bus Lanes on Arterials
R-116: Guidebook for Evaluating, Selecting and Implementing Suburban Transit Services

Sept 24

**Bus service planning at NJ Transit**

Guest Lecturer: Jim Gilligan, NJ Transit Bus Service Planning

Oct 1

**Route planning and scheduling**

Assignment 1 – Route planning *(Due Oct 22)*

**Canadian Transit Handbook**, Ch. 13 – Transit operations
**R-27:** Building Transit Ridership  
**R-28:** Transit Markets of the Future: The Challenge of Change  
**R-36:** A Handbook: Using Market Segmentation to Increase Transit Ridership  
**R-40:** Strategies to Attract Users to Public Transportation  
**R-135** Controlling System Costs: Basic and Advanced Scheduling Manuals and Contemporary Issues in Transit Scheduling  
**R-173** Improving Transit Integration Among Multiple Providers

Oct 8  
**Social and environmental justice and Elderly/disabled (ADA) transportation**  
Transit Capacity and Quality of Service Manual, Third Edition  
Gray & Hoel, Ch. 7 -- Jones and Chambers, Paratransit and ridesharing  
Black, Ch. 6 – Paratransit  
Hansen & Giuliano, ch. 12 – Deka, Social and environmental justice issues in urban transportation  
Black, Ch. 13 -- Special groups of users  
Gray & Hoel, Ch. 21 – Rosenbloom, The transportation disadvantaged  
**R-09:** Transit Operations for Individuals with Disabilities  
**R-82:** Improving Public Transit Options for Older Persons  
**R-105:** Strategies to Increase Coordination of Transportation Services for the Transportation Disadvantaged  
**R-119:** Improving ADA Complementary Paratransit Demand  
**R-124:** Guidebook for Measuring, Assessing, and Improving Performance of Demand Response Transportation  
**R-150:** Communication with Vulnerable Populations: A Transportation and Emergency Management Toolkit  
**R-163:** Strategy Guide to Enable and Promote the Use of Fixed-Route Transit by People with Disabilities

Oct 15  
**Developing vehicle assignments and managing transit labor**  
**Assignment 2: Blocking the Transit System (Due Oct. 22)**  
**R-68:** Part-time Transit Operator: The Trends and Impacts  
**R-77:** Managing Transit’s Workforce in the New Millennium  
**R-127:** Employee Compensation Guidelines for Transit Providers in Rural and Small Urban Areas

Oct 22  
**Modes and technology: Rail, light rail, BRT, AGT and Others**  
Transit Capacity and Quality of Service Manual, Third Edition  
Gray & Hoel, Ch. 5 – Vigrass, Rail transit  
Gray & Hoel, Ch. 10 – Vuchic, Comparative analysis  
Gray & Hoel, Ch. 11 – Deen & Pratt, Evaluating rapid transit  
Canadian Transit Handbook, Ch. 3 – Transit technology  
Black, Ch. 7 - Innovative technology  
FTA, 2008 bus rapid transit vehicle demand & systems analysis update  
**R-13:** Rail Transit Capacity  
**R-90:** Bus Rapid Transit  
**R-118:** Bus Rapid Transit Practitioner's Guide  
**R-152:** Guidelines for Ferry Transportation Services  
**R-167:** Making Effective Fixed Guideway Transit Investments: Indicators of Success
Oct 30

**Community transit**

Guest Lecturer: Steve Fittante, NJ Transit, Local Services

Black, Ch. 12 - The people who ride transit [Black12]
APTA, *Fare Elasticity Study* [Fare Elasticity Study]
Brail, Transit discrete choice model examples [Transit Discrete Choice Model Examples]
Schaller, B. Enhancing transit’s competitiveness: a survey methodology [Enhancing Transit’s Competitiveness]
University of Wisconsin-Milwaukee, Transit demand analysis [U-Wisc demand analysis]

R-49: Using Public Transportation to Reduce the Economic, Social and Human cost of Personal Immobility
R-54: Transit Manager Tool Kit for Rural and Small Urban Transportation Systems
R-55: Guidelines for Enhancing Suburban Mobility Using Public Transportation
R-70: Guidebook for Change and Innovation at Rural and Small Urban Transit Systems
R-73: Characteristics of Urban Travel Demand
R-136: Guidebook for rural Demand-Response transportation: Measuring, Assessing and Improving Performance
R-140: A Guide for Planning and Operating Flexible Public Transportation Services
R-143: Resource Guide for Commingling ADA and Non-ADA Paratransit Riders
R-144: Sharing the Costs of Human Services Transportation
R-150: Communication with Vulnerable Populations: A Transportation and Emergency Management Toolkit
R-161: Methods for Forecasting Demand and Quantifying Need for Rural Passenger Transportation

Nov 5

**Quality of service fundamentals and measures**

**Assignment 3 – Riding Transit (Due Nov 19)**

*Transit Capacity and Quality of Service Manual, Third Edition*

R-63: Enhancing the Visibility and Image of Transit in the United States and Canada
R-88: A Guidebook for Developing a Transit Performance Measurement System
R-111: Elements Needed to Create High Ridership Transit Systems
R-141: A Methodology for Performance Measurement and Peer Comparison in the Public Transportation Industry
R-166: Characteristics of Premium Transit Services that Affect Choice of Mode

Nov 12

**Security in transit systems**

*Transit Security Update, TCRP Synthesis 80*

Hazard and Security Activities of the Transportation Research Board
R-06: Public Transit Security Series (Multiple Volumes)
R-149: Improving Safety-Related Rules Compliance in the Public Transportation Industry
R-160: Improving Safety Culture in Public Transportation
Nov 19

Transit costs, benefits and pricing

Assignment No. 4 – Transit system budget, fares, costs (Due Dec 3)

Gray & Hoel, Ch. 9 – Ferreri, Comparative costs
University of Wisconsin-Milwaukee, Transit performance measurement
University of Wisconsin-Milwaukee, Transit cost analysis

R-89: Financing Capital Investment: A Primer for the Transit Practitioner
R-94: Fare Policies, Structures and Technologies: Update (updated R-10 which is not listed here)
R-129: Local and Regional Funding Mechanisms for Public Transportation
R-133: Practical Measures to Increase Transit Advertising Revenues
R-162: Guidance for Developing a Transit Asset Management Plan

Dec 3

Land use and transit

Beimborn and Rabinowitz, The new suburb: guidelines for transit sensitive suburban land use design
Downs, Still Stuck in Traffic, Appendix E

R-16: Transit and Urban Form
R-22: The Role of Transit in Creating Livable Metropolitan Communities
R-33: Transit Friendly Street: Design and Traffic Management Strategies to Support Livable Communities
R-74: Costs of Sprawl
R-176: Quantifying Transit’s Impact on GHG Emissions and Energy—The Land Use Component

Planning and managing transit systems

Gray & Hoel, Ch. 16 – Smerk, Management of public transportation
Gray & Hoel, Ch. 17 – Davis and Mundy, Public transportation marketing
Canadian Transit Handbook, ch. 5 – Marketing and communications
R-103: Public Transportation Operating Agencies as Employers of Choice
R-159: Transforming Public Transportation Institutional and Business Models

Course wrap up

Dec 10

Project presentations

Dec 17

Project presentations
The Transit Cooperative Research Program (TCRP) is part of the Transportation Research Board that is housed in the National Academies. TCRP conducts practical research to help the public transportation industry improves its operational effectiveness and efficiency. TCRP was established in 1991 and receives funding from the surface transportation program. The reports that TCRP produces represent the best body of current knowledge related to public transportation in the United States.

There are four types of research reports that TCRP produces. They are:

1. Research Report—R—A report that is the result of applied research in the transit industry.
3. Legal Research Digest—LRD—A report that examines legal issues related to public transportation administration and operation.
4. Research Results Digest—RRD—A summary report of public transportation research when a full report is not warranted.

All of the reports are available electronically and can be accessed using the following link:

http://www.tcrponline.org/bin/publications.pl?category=22

The class is encouraged to review and/or read the reports related to each class. The entire body of TCRP research is a major resource for developing the final class paper.

One of the key reports that covers all aspects of public transportation is R-165: Transit Capacity and Quality of Service Manual. 3rd Edition. This is a key document for this class. In addition, R-95: Travelers’ Response to Changes in the Transportation System (multiple chapters) covers numerous topics that will be discussed in class.

References for the Syntheses, Legal Research Digests and Research Results Digests are not provided. Please consult the web link to see the listing of the research in these formats.