TRANSPORTATION and the ENVIRONMENT, Spring 2015

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Office hours: by appointment only, please send an email to arrange

Learning Objectives

To provide an understanding of the complex interrelationships between transportation and the environment, to discuss the various environmental impacts caused by the provision and use of transportation, to analyze causes and to discuss technology and policy solutions to environmental problems. The course will focus on the economics of environmental, land use and transportation policy and how these affect environmental outcomes.

At the conclusion of this course, students will understand:
• The environmental impacts associated with all modes of transportation;
• How individual behavior affects the environmental impacts of transportation;
• Technical and policy solutions to mitigate environmental impacts of transportation;
• Social and economic impacts associated with environmental effects of transportation and the mitigation of those effects;
• The sources of climate change, the consequences of climate change, and links to transportation policy; and,
• Energy and resource issues associated with transportation, including issues associated with alternative fuels.

Assignments and Assessment

1. Research paper and presentation: 30%
2. Discussion papers: 20%
3. Take home exam: 30%
4. Class participation: 5%
5. Random quizzes: 15%

Percentages are subject to change!

The number of Discussion Papers that you will be responsible for is dependent on the number of students registered for class. Currently, there are 19 registered in the class and you will be responsible for 1 discussion paper each.

All readings and resources are on Sakai. You will need to purchase an iClicker or the iClicker Go smartphone App and register on the Sakai course website.
Course Outline and Readings

Jan 22: Week 1

Overview of environmental problems in transportation
Brief overview of various environmental issues associated with transportation and introduction to topics covered in course.

US transportation and environmental laws and policy
Transportation and environmental legislation and policy framework. Includes discussion of NEPA, CAA, ISTEA and additional transportation policies with connection to environment (for California this includes AB32 and SB375).

Readings:
Federal Highway Administration and Federal Transit Administration, The Transportation Planning Process: Key Issues, FHWA-HEP-07-039

MAP 21 summaries from FHWA and the National League of Cities

Jan 29: Week 2

Environmental and resource economics issues in transportation
Issues associated with resource extraction (oil, natural gas) are discussed. Basic background is given on environmental economics and optimal extraction of resources.

Readings:

Annual Energy Outlook 2014 – Early Release Overview

EPA – Hydraulic fracturing website

Greene, David L., Testimony to the US Senate Committee on Energy and Natural Resources, July 2012


Engelder, Terry, 2011, Response: Fracking is Crucial to global economic stability; the benefits outweigh the environmental risks

Discussion papers:


Feb 5: Week 3

Climate change: Policy and Impacts
Background on the science of climate change and the impacts of climate change on communities and populations. Discussion of transportation policies to mitigate and adapt to climate change.

**Final project assignment handed out.**

**Readings:**

Pew Center on Global Climate Change, Climate 101: Science and Impacts, January 2009.


**Reference Resources:**


**Discussion papers:**


**Feb 12: Week 4**

**Travel demand management: policies (1)**
Policies to reduce travel demand are covered. This includes pricing (of travel and fuel), parking, land use, and other demand management policies.

**Readings:**


**Reference Resources:**

TRB Special report 298, Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy Use, and CO2 Emissions, National Research Council: Washington, DC

**Discussion papers:**


Feb 19: Week 5

**Travel demand management policies: behavior (2)**

Travel behavior and how this can affect policy design, including induced travel and land use interaction effects.

**Readings:**


*Technical Synthesis: Model Uncertainty*, Travel Model Improvement Program, Federal Highway Administration, undated.

**Discussion papers:**


Feb 26: Week 6

**Air pollution: Transport sources, technology solutions, modeling and social costs**

Overview of health impacts associated with criteria air pollutants. Transport sources of these pollutants and technology solutions. Environmental and social costs.

**Readings:**


EPA, What are the six common air pollutants? – web link.

Drum, Kevin, America’s Real Criminal Element: Lead, Mother Jones, Feb. 2013

**Reference Resources:**

US EPA, 2011, Our Nation's Air - Status and Trends through 2010

US EPA, 2001, EPA Guidance: Improving Air Quality through Land Use Activities, Office of Transportation and Air Quality, EPA-420-R-01-001
Discussion papers:


Mar 5: Week 7

**Alternative Transportation Fuels**
Alternative fuels that are available and being researched for transportation. Life-cycle analysis to compare different fuel sources, including ethanol, methane, hydrogen, and electricity.

**Project proposals due**

**Readings:**


Discussion papers:


Mar 12: Week 8

Environmental Issues in Aviation
Focus is primarily on air pollutant and climate impacts of aviation. What policies are available to mitigate aviation environmental impacts.

Readings:


Aviation and Climate Change: The Views of Aviation Stakeholders, Feb. 2009


Discussion papers:


Mar 19: Week 9: SPRING BREAK – NO CLASS
Mar 26: Week 10

**Maritime and freight transport and globalization**

Logistics of freight transportation and technologies for minimizing emissions. Intermodal transportation including interactions between trucks, rail and maritime transport. Terminal and port planning issues.

**TAKE HOME MIDTERM HANDED OUT. THIS WILL BE DUE ON MONDAY AT 8:00am.**

**Readings**

Giuliano, Genevieve, Thomas O’Brien, Laetitia Dablanc, and Kevin Holliday, Synthesis of Freight Research in Urban Transportation Planning, National Cooperative Freight Research Program, report 23, Transportation Research Board, 2013. (see section 2.2 on “Emissions and Other Environmental Problems and Strategies” and parts of section 2.3)


US EPA, 2008, EPA Finalizes More Stringent Emissions Standards for Locomotives and Marine Compression-Ignition Engines, Office of Transportation and Air Quality, EPA 420-F-08-00, 4 March 2008


Technologies and Approaches to Reducing the Fuel Consumption of Medium- and Heavy-Duty Vehicles, Committee to Assess Fuel Economy Technologies for Medium- and Heavy-Duty Vehicles; National Research Council; Transportation Research Board, 2010.

**Discussion papers:**


Apr 2: Week 11

**Guest lecturer: Jeff Perlman, NJTPA, Climate Change issues for an MPO**

MOVES and GREET models, in the 3rd floor computer lab.
Apr 9: Week 12

Environmental impact assessment in transportation
Overview of policy framework of environmental impact assessment. Defining the purpose and need for a project, defining realistic alternatives, issues with forecasting and travel analysis. Decomposing a sample EIS.

Public participation in transportation planning: guest lecturer, Jon Carnegie

Readings:


Record of Decision, Dec. 2010 (this is loaded on Sakai, attachments are at website)

April 16th: Week 13

Environmental Justice: guest lecturer, David Aimen

Readings:


Discussion Papers


April 22: Field trip to TRANSACTION CONFERENCE in Atlantic City.
http://www.njtransaction.com/
Apr 23: Week 14

**Guest lecturer: Jeanne Herb, Associate Director of the Environmental Analysis and Communications Group at the Bloustein School, formerly at NJ DEP**

**Noise: impacts and sources**
Noise policy in the US and Europe. Factors associated with traffic noise and mitigation techniques. Economic, health and nuisance impacts of noise, introduction to hedonic analysis to estimate noise costs. Aviation and airport noise impacts, including mitigation measures.

**Readings:**


**Reference Resources:**


Apr 30: Week 15

**Project presentations**

May 7: Week 16 (during exam week)

**Project presentations**
**Academic Integrity**

Academic integrity is essential to the success of the educational enterprise and breaches of academic integrity constitute serious offenses against the academic community. Every member of that community bears a responsibility for ensuring that the highest standards of academic integrity are upheld. Only through a genuine partnership among students, faculty, staff, and administrators will the University be able to maintain the necessary commitment to academic integrity.

Full policy is available at: [http://academicintegrity.rutgers.edu/integrity.shtml](http://academicintegrity.rutgers.edu/integrity.shtml)

A good resource for understanding what plagiarism is and how to avoid it is available at: [www.plagiarism.org](http://www.plagiarism.org). Be sure to also be familiar with how to cite your sources. **If you don't understand what plagiarism is, then come speak with me.**

Written assignments for this course will be submitted electronically using TurnItIn plagiarism detection software. Examples of what this software can detect are on the course Sakai site. **Plagiarism on any component of the course will result in an F for that component, and possibly an F for the entire course. If you have previously plagiarized you will be expelled from the program.**

**Absences from class**

Students are expected to attend all classes; if you expect to miss any classes, please use the University absence reporting website [https://sims.rutgers.edu/ssra/](https://sims.rutgers.edu/ssra/) to indicate the date and reason for your absence. An email is automatically sent to me. Unexcused absences will count against your participation grade.