Transportation, the Environment, and Health (14196) ENVR E-163
Thursday, 5:30-7:30
September 5th – December 19th, 2013

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Course Description:

This generation inherited transportation systems and now we have climate change and negative health impacts from some forms of transportation. We want students to understand the existing transportation systems (rail, ship, vehicle, mass transit, bicycle, walking) and the environmental and health impact of each. From this knowledge, students could choose to use the most environmental and healthy transportation systems and/or they could help in overhauling and making transportation systems more sustainable and healthy for everyone. The course will then help students to better understand and impact public policies as well as the impacts of their own personal transportation decisions. For history, we will explore bicycles (which predated cars), mass transit, and vehicles. For health, we will calculate METs (Metabolic Equivalent of Task or human energy expenditure of different forms of transportation - 1 MET = a car passenger; 2 METs = a driver; 1 MET = transit rider; 3 METs = walking; and 8 METs = bicycling). We also will discuss the negative health effects of mobile source air pollution and compare costs, return on investment, and the number of jobs in repairing a bridge or creating a bicycle facility. Also discussed will be car versus bicycle parking and related costs and benefits. All forms of transportation would additionally be measured by travel time, convenience, noise, fatalities, runoff, heat island effect, quality of life, identity, vegetation, and wildlife migration. The expectation is with more information and awareness, decisions about new transportation infrastructure could be based on many complex factors that go beyond job creation (New Deal), Level of Service (LOS - moving vehicles quickly), and crumbling infrastructure.

Intended Audience:

Planners, environmentalists, architects, developers, government officials, transportation specialists, ecologists, and public health professionals.

Course Objectives:

By the end of the course, the students will have demonstrated competencies in the following:

1) Understand the general history of transportation systems and urban designs (rail, ship, mass transit, bicycle, and walking).

2) Critically analyze different measures of transportation systems in relation to the environment (ecology, mobile source air pollution, heat island effect, runoff, etc.) and health (Metabolic Equivalent of Task, injuries, fatalities, quality of life, socializing, economics, etc.)

3) Recommend policies to change the transportation systems to better respond to the environment and health given the complexities and difficulties of changing the existing transportation system, social patterns, environmental constraints, funding difficulties, need to respond to disadvantaged populations, and technological limitations.

4) Synthesize information on transportation systems to be able to effectively propose in writing one change to the current transportation system that would have the best chance to better respond to the environment and health

5) Learn how to write academic papers in the IMRAD style (Introduction, Methods, Results and Discussion).

Course Objectives Based on the Course Format:

At the completion of this course, students will be able to:

1) Propose a policy that could be initiated on the local, state, or national level to improve one element of the transportation system (will propose three elements in writing throughout the course – the student will select the most promising element, of the three, for the best improvement to an aspect of the transportation system for the final paper).

2) Defend this policy in writing, using any of the following:

- History
- Current information about transportation systems, the environment, or health
- Measures (existing or new – Level of Service – vehicle volumes, METs, mobile source air pollution reduction, etc,)
- Understanding the need to maintain some elements of status quo (vehicular dominant transportation, serving the needs of the underserved, etc.)

Grading

Grading will be based on three papers (3 pages long – 3 ideas for changing the transportation system) and 1 final paper (10 pages long – select the best way to change the transportation system and the best defense for your recommendation). Students will also be graded on an interactive exercise so students have the opportunity to interact, even through distance learning. The papers will follow the IMRAD structure (Introduction, Methods, Results, and Discussion) and grading will be based on the IMRAD style.

Points:

100 points for each of the 3 papers	=	300 points
500 points for the final paper	=	500 points
200 points for interactive participation	=	200 points
		1,000 points total

Course Material

Approximately a week before each class, a class syllabus for that class will be uploaded on the course web site that will include the full description of that lecture plus the reading materials. Some of the reading material will have been selected by guest lecturers and thus it is better to provide each syllabus near the class.

I. Theme - Understanding History of Transportation Systems and Criteria for the Current System Related to the Environment and Health

Class #1 (September 5) Course Introduction (Anne Lusk and Mark Chase)

Class #2 (September 12) History of Walking, Ships, Rail/Mass Transit, and Bicycles (Anne Lusk)

Class #3 (September 19) History of Motor Vehicles and Parking (Mark Chase)

II. Theme – Fundamentals Concepts of Transportation Thoroughfares and How they Work

Class #4 (September 26) Streetscape Design & the Pedestrian Environment (Mark Chase with invited speaker TBA) ***[First short paper due]***

Class #5 (October 3) Ecology of Highways – (Anne Lusk with invited speaker)

Class #6 (October 10) Transit Systems – what works and what doesn't work (Mark Chase)

III. Theme - How Students Could Help Overhaul Transportation Systems to Make Transportation More Sustainable and Healthy for Everyone

Class # 7 (October 17) Bicycle Parking Inside Homes/Offices/Schools/Stores, Injury Prevention, Novel Landscaping, Mobile Source Air Pollution Reduction (Anne Lusk)

Class #8 (October 24) Techniques for Reducing Auto-dependence (Mark Chase) ***[Second short paper due]***

Class #9 (October 31) Managing Car Proliferation/Car-Sharing & Congestion Pricing (Mark Chase)

IV. Theme –Transportation Metrics and Consideration of New Measures Related to the Environment and Health

Class #10 (November 7) Metabolic Equivalent of Task (MET Routes and Social Cycle Tracks/Date Night Cycle Tracks – (Anne Lusk)

Class #11 (November 14) Vehicle Levels of Service (LOS) and Measures of other Levels of Service (Mark Chase) [**Third short paper due]**

Class #12 (November 21) Social Justice in the Transportation Systems, Self-Identity in Transportation Choices, and Economic Development (Anne Lusk)

V. Theme – Traditional and Innovative Funding Mechanisms for Transportation

Class #13 (December 5) Federal Transportation Funding/and the Metropolitan Planning Process (Mark Chase)

Class #14 (December 12) Novel funding mechanism and the ability to propose such funding (Anne Lusk)

Class #15 (December 19) Anne Lusk and Mark Chase with interaction from the students to present their best ideas online **[Final 10 page paper due]**