How has our society’s love affair with the private car shaped the environment in which we live? How are new policies and laws affecting our transportation options and the world environment in general? How are other countries responding to market changes and environmental impacts of transportation? How far is each individual from such issues as the new energy bill, fuel cells, hybrid electrical vehicles, hydrogen economy, and climate change?

This course exposes students to these questions by focusing on the nexus of transportation and air quality, energy, and climate change concerns. It is interdisciplinary, drawing upon transportation, air quality, statistics, market research and policy.

Course Objectives

- Understand the many forces and event that shape auto-centric transportation systems, and to explore investments and policies that would enhance the transportation system—in terms of performance, productivity, access, energy use, safety, and environmental impacts—and what would do so in an equitable fashion.

- Examine impact of transportation on air quality; Review mobile source regulatory framework; internal combustion engine gas/particle emissions; gain quantitative understanding of emissions testing methodologies, ozone formation mechanisms; weekend/weekday emissions issues; driver behavior and emissions; laboratory vs. real-world emissions levels.
• Gain critical understanding of the theory, structure, functioning, and application of the major air quality models currently used for emissions estimation. Understand the individual model components for the major models currently in use. This includes their underlying principles, assumptions, policy and application implications, data requirements, and advantages and disadvantages.

• **Promote technology, regulation/policy, management, and financing innovations** in environment, energy, and transportation systems, obtain active learning and independent research training and skills to implement the innovative ideas, writing (topic, key ideas, major problems/issues to address, tasks, methodology/approach)

**Reading Materials**


2. Students will be required to download user manuals, software, and additional readings from such state and federal agencies as the Environmental Protection Agency, New York Metropolitan Transportation Consortium (NYMTC), NYSDEC, and the California Air Resources Board. URLs are given below. Course software are also installed on computers in one of the computer labs in Engineering Library in Carpenter Hall.
   EMFAC2007: [http://www.arb.ca.gov/msei/onroad/latest_version.htm](http://www.arb.ca.gov/msei/onroad/latest_version.htm)
   MOBILE6 Vehicle Emission Modeling Software: [http://www.epa.gov/OMS/m6.htm](http://www.epa.gov/OMS/m6.htm)
   National Mobile Inventory Model (NMIM): [http://www.epa.gov/OMS/nmim.htm](http://www.epa.gov/OMS/nmim.htm)

3. Additional reading assignments may also be given as class handouts

**Format and Expectations**

• **CLASS = DISCUSSION+LECTURE+CASE FORMAT** – Assigned reading must be done before class!

**Class organization:** this course will not follow the path of a traditional lecturing but will focus on active learning and independent research training. This allows us to address emerging real-world questions in transportation and environment/energy planning and practice that are of crucial interest to not only academics, but also policy makers and industry. Such practical questions are likely to emerge in most types of jobs you might find yourself in – such as in consulting firms and government agencies, as well as academic forums – where you might be required to write reports or papers to summarize and critique an existing literature, or potentially to carry out your own analysis. The course provides a guide to pursuing independent research about such questions.