Teaching Sustainability in Transportation Planning

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CEE 5/6240: Urban & Regional Transportation Planning

This course introduces students to the problems, policies, processes, and analytical procedures involved in urban and regional transportation planning. There are four modules:

1. **Problems & processes:** current issues, historical background, government institutions, and planning requirements.
2. **Data collection:** multimodal traffic volumes, household travel surveys, and establishment data to support planning methods.
3. **Analytical & quantitative methods:** traditional four-step travel demand models—trip generation, trip distribution, mode choice, and traffic assignment—and newer activity-based models.
4. **Special issues:** non-auto modes (public transit, walking, and bicycling) and policy applications (air quality, health, and equity).

Students learn fundamental principles, gain factual knowledge, apply course materials, and develop professional skills through readings, lectures, discussions, homework, an exam, and a final group project.

**Motivation**

- The transportation sector has significant impacts on elements of sustainability, including: greenhouse gas emissions, air pollution, energy consumption, mobility/accessibility, and health/well-being.
- Nevertheless, sustainability issues have yet to be consistently and comprehensively integrated into transportation planning practices.
- I want my students to be able to effectively communicate, discuss, and analyze sustainability impacts of transportation projects alongside other (sometimes competing) priorities.

**Action 1—Frame issues, impacts, & policies in terms of sustainability.**

Students will have two new classes to learn, read, discuss, and debate global and domain-specific sustainability topics.

**Outcomes:** Broader views of transportation’s impacts on humans and the environment, and how those impacts affect local/global sustainability (environmental, social, and economic).

**Impacts:** Changes in behaviors, attitudes, and/or perceptions of transportation’s impacts; system-level thinking about how the transportation system affects other systems.

**Action 2—Develop a critical & reflective sustainability assignment.**

Students must review and critique a sustainable transportation policy; assert a position and its opposition; and propose scientific research.

**Outcomes:** Increased knowledge of a transportation sustainability issue or policy, the various positions taken, and potential transportation-related strategies.

**Impacts:** Ability to find and critically evaluate sustainability facts and findings regarding (especially complex and contentious) sustainability-related transportation policies.

**Action 3—Add a sustainability element to the final group project.**

Teams must analyze their project along one sustainability-related dimension:

- Environment
- Health
- Social equity
- Economy

**Outcomes:** Real-world experience confronting and evaluating sustainability impacts of transportation projects and addressing conflicts between different planning goals.

**Impacts:** Practice addressing sustainability issues of transportation projects, and an awareness of how to address sustainability issues in (near-future) professional careers.

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