

TRANSPORTATION POLICY AND THE ENVIRONMENT

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Objective

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

Students will be able to describe, to measure and to quantify environmental impacts of individual behaviour, of transport policies and of transport projects, they will understand the complex nature of the causes of environmental impacts from transport and will be aware of social and economic implications of possible solutions.

Assignments and Assessment

1. Moderated research paper and presentation: 30%
2. Class presentation (individual or group depending on class size): 20%
3. Class participation: 5%
4. Discussion papers: 10%
5. Final exam: 35%

Course Outline and Readings

1. Overview of environmental problems in transportation

2. US transportation and environmental laws and policy

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

3. Environmental and resource economics issues in transportation

US Government Accountability Office, 2007, Uncertainty about Future Oil Supply Makes it Important to Develop a Strategy for Addressing a Peak and Decline in Oil Output, GAO-07-283

4. Travel demand management policies

Meyer, Michael D., 1999, Demand management as an element of transportation policy: Using carrots and sticks to influence travel behavior, *Transportation Research A (Policy and Practice)*, 33: 575-599.

Goodwin, Phil, Joyce Dargay, and Mark Hanly, 2004, Elasticities of Road Traffic and Fuel Consumption with Respect to Price and Income: A Review, *Transport Reviews*, 24(3): 275-292.

King, David, Michael Manville, and Donald Shoup, 2007, For Whom the Road Tolls - The Politics of Congestion Pricing, *Access*, no. 31, Fall 2007.

Small, Kenneth A. and Kurt Van Dender, 2007, If Cars Were More Efficient Would We Use Less Fuel, *Access*, no. 31, Fall 2007.

Graham, Daniel J. and Stephen Glaister, 2002, The Demand for Automobile Fuel - A Survey of Elasticities, *Journal of Transport Economics and Policy*, 36: 1-26.

Shoup, Donald, 1999, The Trouble with Minimum Parking Requirements, *Transportation Research A (Policy and Practice)*, 33: 549-574.

Discussion papers:

Greenberg, Allen, 2009, Costs and benefits of varying per-mile insurance premiums, draft working paper.

Delucchi, Mark and James J. Murphy, 2008, How large are tax subsidies to motor-vehicle users, *Transport Policy*, 15: 196-208.

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

Noland Robert B., and Mohammed A. Quddus, 2006, Flow improvements and vehicle emissions: Effects of trip generation and vehicle control technology, *Transportation Research D (Transport and Environment)*, 11: 1-14.

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

US EPA, 2008, National Air Quality - Status and Trends through 2007, Office of Air Quality Planning and Standards, EPA-454/R-08-006

Ishaque, Muhammed M., and Robert B. Noland, 2008, Simulated Pedestrian Travel and Exposure to Vehicle Emissions, *Transportation Research D (Transport and Environment)*, 13: 27-46.

6. Climate change: Policy and Impacts

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

Kahn Ribeiro, S., S. Kobayashi, M. Beuthe, J. Gasca, D. Greene, D. S. Lee, Y. Muromachi, P. J. Newton, S. Plotkin, D. Sperling, R. Wit, P. J. Zhou, 2007: Transport and its infrastructure. In *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Discussion papers:

Appendix 5: Transportation Policies and Strategies – New Jersey GHG reduction report draft 2008

Yang, Christopher, David McCollum, Ryan McCarthy, and Wayne Leighty, in press, Meeting an 80 percent reduction in greenhouse gas emissions from transportation by 2050: A case study in California, *Transportation Research D (Transport and Environment)*.

7. Alternative Transport Fuels

Searchinger, Timothy, *et al*, 2008, Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change, *Science* 319, 1238

Lackner, Klaus S., 2003, A Guide to CO₂ Sequestration, *Science*, Vol. 300. no. 5626, pp. 1677 – 1678

Keith, David W. and Alexander E. Farrel, 2003, Rethinking Hydrogen Cars, *Science*, Vol. 301. no. 5631, pp. 315 - 316

8. Aviation and climate change

Williams, Victoria, Impacts of the Aviation Sector on the Environment, for inclusion in the Handbook of Environmentally Conscious Transportation, ed. Myer Kutz, 2008

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

Williams, Victoria, and Robert B. Noland, 2005, Variability of contrail formation conditions and the implications for policies to reduce the climate impacts of aviation, *Transportation Research D (Transport and Environment)*, 10: 269-280.

Discussion papers:

Mayor, Karen and Richard S.J. Tol, 2009, Aviation and the environment in the context of the EU-US Open Skies agreement, *Journal of Air Transport Management*, 15: 90-95.

Bows, Alice and Kevin L. Anderson, 2007, Policy clash: Can projected aviation growth be reconciled with the UK Government's 60% carbon-reduction target?, *Transport Policy*, 14: 103-110.

9. Maritime and freight transport and globalization

Eyring, Veronika, James J. Corbett, David S. Lee, and James J. Winebrake, 2007, Brief summary of the impact of ship emissions, Document submitted to the Health and Environment sub-group of the International Maritime Organization

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, 4March 2008

ICF Consulting, 2002, Industry Options for Improving Ground Freight Fuel Efficiency – Technical Report, Draft Report for Review, Prepared for the U.S. Environmental Protection Agency

10. Noise: impacts and sources

U.S. Department of Transportation, Federal Highway Administration, Highway Traffic Noise in the United States: Problem and Response, April 2006, FHWA-HEP-06-020

U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Highway Traffic Noise Analysis and Abatement Policy and Guidance, 1995.

UK Department of Transport, Welsh Office, 1988, Calculation of Road Traffic Noise, HMSO.

Nelson, Jon P., 2004, Meta-Analysis of Airport Noise and Hedonic Property Values: Problems and Prospects, *Journal of Transport Economics and Policy*, 38: 1-28

11. Land use, transportation and induced travel

Noland, Robert B., and Lewison L. Lem, 2002, A Review of the Evidence for Induced Travel and Changes in Transportation and Environmental Policy in the United States and the United Kingdom, *Transportation Research D (Transport and Environment)*, 7(1): 1-26.

Waddell, Paul, Gudmundur F. Ulfarsson, Joel P. Franklin, and John Lobb, 2007, Incorporating Land Use in Metropolitan Transportation Planning, *Transportation Research A (Policy and Practice)*, 41: 382-410.

Noland, Robert B., 2007, Transport Planning and Environmental Assessment: Implications of Induced Travel Effects, *International Journal of Sustainable Transportation*, 1(1): 1-28.

Handy, Susan, Xinyu Cao and Patricia Mokhtarian, 2005, Correlation or causality between the built environment and travel behaviour? Evidence from Northern California, *Transportation Research D (Transport and Environment)*, 10: 427-444.

Cervero, Robert and Kara Kockleman, 1997, "Travel Demand and the 3D's: Density, Diversity, and Design", *Transportation Research D (Transport and Environment)*, 2(3): 199-217.

Discussion papers:

Bodea, Tudor D., Laurie A. Garrow, Michael D. Meyer, Catherine L. Ross, 2009, Socio-demographic and built environment influences on the odds of being overweight or obese: The Atlanta experience, *Transportation Research A (Policy and Practice)*, 43: 430-444.

Duran, Rodrigo and Michael L. Lahr, On the Effectiveness of Smart Growth Programs in Curbing Urban Sprawl, draft working paper.

12. Environmental justice

Deka, Devajyoti, Social and Environmental Justice in Transportation, from Susan Hanson and Genevieve Giuliano (eds). 2004. *The Geography of Urban Transportation*, 3rd Edition. New York: Guilford Press

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Written assignments for this course will be submitted electronically using plagiarism detection software.