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“A Framework for Sustainable and Strategic Decision Making Using Economic Input-Output Life Cycle Assessment (EIO-LCA), Including Applications to the Transit Bus Fleeting Problem”

Thursday –June 2, 2011
4:00 - 5:00 pm
Refreshments available at 3:30 pm

Abstract:
The decisions made at the purchasing phase of infrastructure management have long lasting implications for the sustainability and level of service provided to a community. In order to properly plan for transit operation, vehicle costs must be valued in light of their total environmental and economic footprint over the planning horizon. Currently, the growing trends of environmental regulation and sustainable design, as well as the unprecedented availability of conventional and alternative fuel bus technologies, have increased the focus on the bus fleeting problem.

We use an integrated framework which incorporates environmental impacts into the decision making process to find the optimal bus fleets for a transit operator in a variety of scenarios. The framework is built upon models of production economics and economic input-output life cycle assessment to provide a practical, prescriptive method to support environmentally conscious decision making and design. The flexibility of the framework means that it can be used in a variety of applications to provide insights into the tradeoffs between environmental and economic factors. We also examine the relationships between cost, level of service, and environmental issues inherent in vehicle fleeting and the wider field of transportation.