

**Project Title:** A framework for estimating emissions of freight transport operations

**Principal Investigator:**

Pablo L. Durango-Cohen, Associate Professor, Civil and Environmental Engineering

**Center Project Number:** Y5-05

**Award Amount:** \$76,118

**Start Date:** September 1, 2011

**End Date:** August 31, 2012

In recent years, corporations have shown increasing interest in measuring their environmental impacts, especially pollutant emissions. Business interests, e.g., preparing for imminent regulation, motivate this trend as much as ethics. Investors and customers factor environmental impact into their business decisions, and sustainable companies have a competitive advantage.

For companies with large distribution systems, emissions from transport operations constitute a significant portion of their environmental impact. Many models have been developed to estimate vehicle emissions, though the focus in research and in practice has been on automobiles, as opposed to trucks and other heavy vehicles. In addition, there is a lack of standards governing emissions reporting. Wide variations and lack of documentation make comparisons between companies or years difficult. The goal of this project is, therefore, to develop a rigorous, flexible, and practical framework for estimating the emissions of freight transport operations. It will be based on simple, yet defensible and reliable economic models of marginal emissions contributions from individual shipments, and it will be implemented as an online tool. The initial focus will be on trucking, but extensions for other freight modes are possible.

The proposed framework will provide several practical advantages over currently available methods. In particular, the framework will:

- Be based on data that are commonly available from freight carriers;
- Provide error bounds, describing the precision of emissions estimates;
- Provide quantitative support for strategic shipping and supply-chain decisions; and importantly,
- Allow for consistent comparison among companies and across years.

The proposed framework and online implementation will be validated with data from the transportation operations of two Fortune 500 companies that have established relationships with the NUTC and CCITT.