



OTREC
OREGON TRANSPORTATION RESEARCH
AND EDUCATION CONSORTIUM

P.O. Box 751
Portland, OR 97207-0751
Phone: (503) 725-2843
Web site: <http://otrec.us>
Email: askotrec@otrec.us



TRANSPORTING THE ECONOMY

A Portland State University course reveals the complexities of designing a freight system.

Issue

The efficient, timely and reliable movement of freight is a critical responsibility of the transportation system and strategically important to the U.S. economy. Today, Americans purchase billions of dollars worth of goods over the Internet for home delivery, routinely sent using next-day-express packages. They also expect globally produced fresh fruits, flowers and vegetables to be available year-round. These shipments move over an extensive freight transportation system comprising millions of vehicles and thousands of miles of road, track and pipeline infrastructure, all supported by sophisticated information technology and operated, managed and maintained by a large, specialized labor force.

These are astounding and vital concepts for students in transportation engineering and planning to understand. This project provided a course in distribution logistics at Portland State University. The long-term goal of this course was to provide a greater understanding of the complex issues surrounding urban freight and logistics that would be relevant to graduate students in civil engineering, urban planning and business programs.

Research

The distribution logistics and urban freight course was offered to upper-division undergraduate students and graduate students at PSU in 2007 and 2008. It presented a multidisciplinary approach to the study of urban logistics, its stakeholders and the environment. This is significant because freight transportation is heterogeneous in nature – meaning various commodities are moved by various modes and carriers over numerous routes – and is almost exclusively the domain of the private sector. The public infrastructure, however, supports much of the freight system. This heterogeneity and the level of private-sector involvement present unique challenges for transportation professionals. A working knowledge of supply-chain logistics and the freight transportation system is essential to develop long-range transportation plans and

THE ISSUE

Globalization and the proliferation of Internet shopping has meant an increased reliance on the freight transportation system for delivery, often the next day, of everything from manufactured goods to produce.

THE PROJECT

Miguel Figliozzi of Portland State University created a course on distribution logistics to give students an understanding of the pieces that make the freight network run. Concepts included:

- Supply chain management and its relationship to freight system performance;
- Challenges of logistics and distribution in congested urban areas;
- Availability of data sources and models for planning, research and design of freight and logistics systems.

IMPLICATIONS

The course spurred research proposals that have employed a growing number of graduate students.

MORE INFORMATION:

otrec.us/project/187

PROJECT INFORMATION

TITLE: Distribution Logistics Course

LEAD INVESTIGATOR: Miguel Figliozi, Portland State University

PROJECT NUMBER: 2008-187

PARTNERS: Portland State University

COMPLETED: August 2009

ONLINE: otrec.us/project/187

projects to improve and enhance the freight system in a particular region, as well as to minimize negative impacts on the environment, communities and the economy.

The course was designed to touch on a variety of issues integral to students' comprehension of the urban and regional freight system. These include a better understanding of carrier and commercial vehicle operations; shippers' perspectives and behaviors; and the public sector's perspective, freight planning models and frameworks.

By the end of the course, students were expected to understand the fundamental concepts of supply-chain management and its relationship to freight transportation system performance. Additionally, students gained better understanding of the opportunities and challenges associated with economic globalization, as well as the challenges particular to distribution logistics within congested urban areas. Students also learned about the availability of data sources and models for use in planning, research and design of freight and logistics systems. Moreover, throughout the course, students developed the skills necessary to be integral players in public and private transportation and logistics planning, design and operation teams.

Implications

The course spurred the production of reports and white papers. Class presentations and discussions stimulated the project's primary investigator, professor Miguel Figliozi, to submit an array of successful research proposals in the freight and logistics fields. These research proposals have employed a growing number of graduate students and have strengthened the symbiosis

between teaching and research activities.

As the only course offered that integrates supply chain, freight and logistics concepts, it strengthened the transportation programs in the Oregon University System. In addition, the presence of guest lecturers and discussion of research opportunities in freight and logistics strengthened ties with the Port of Portland and the Oregon Department of Transportation.

Student feedback about the course was positive. Comments revealed that the course materials sparked an interest in freight transportation issues and increased students' awareness of the complexities of designing a freight and logistics system. Following the positive feedback and outcomes of this course, Figliozi has integrated the materials into a course that looks at the interrelations between freight, logistics, supply chains and sustainability.

Selected titles of term papers:

- ❑ The Impact of Increasing Demand for Sustainable Food Products and Practices on Grocery Supply Chains;
- ❑ Effects of the Trucking Hours of Service Changes;
- ❑ A Comparative Analysis between the U.S.-Mexico and U.S.-Canada Borders;
- ❑ Value Analysis of Truck-only Lanes in Metropolitan Areas;
- ❑ Analyzing the Difference Between Retail and E-Commerce Transportation in Long-tail Used Book Sales;
- ❑ Greenhouse Gases and the Food Supply Chain: Thinking Beyond Transportation Impacts
- ❑ Intelligent Freight Technologies;
- ❑ The Critical Role of Third-Party Logistics Services in the Supply Chain Management and Logistics Industry;
- ❑ Freight Truck Damage Study;
- ❑ Loading and Unloading Freight Zones in Portland Urban Areas;
- ❑ Freight Transportation Research Project: Where Does it Come From? How Does it get Here? Our Nation's Food Supply.

Figure: Selected distribution logistics and urban freight term papers

Graduate and upper-level undergraduate students submitted these and other term papers for the distribution logistics and urban freight course.