

Freight Transportation Demand Modeling

Overview

Over the past few years, India's gross domestic product has grown over 7% with an economic value estimated at US\$ 1.22 trillion per year. Unfortunately, India's freight transportation infrastructure is not adequately built to accommodate this rapidly increasing growth. Freight is defined here as movement of goods and commodities by truck, rail, air, water, and pipeline. The demand for freight movement is expected to increase at a rapid pace with evolving needs of e-commerce, express deliveries, and expedited imports and exports. The purpose of this course is to introduce students, researchers, and practitioners to develop methodological approaches to estimate freight demand in terms of freight generation, distribution, choice of mode and route. The theoretical concepts and practical considerations will be discussed in the class on how freight modeling is being carried out at various level of geographies such as international, national, state and metropolitan levels. The course will introduce participants to key freight industry terms, concepts and issues, and provides a freight big picture based on performance of the major freight transportation modes. Building on this factual knowledge the course provides worked examples of the mathematical and statistical models and solution procedures used to estimate and forecast freight movements by mode and commodity. The course will discuss available approaches to model freight transportation demand. Concise description of the state-of-the-art mathematical models of freight transportation system, focusing primarily on areas where it deviates from passenger transport models. Such mathematical models can support freight demand model development and facilitate policy design in different ways including: explanation of drivers of freight transport; modeling and forecasting of freight flows; performance assessment of freight systems; and design of freight operations. During the course participants will have the opportunity to use open source softwares and work on international case studies.

Some of the topics to be covered in the course includes: * Three-layer structure of freight: Global, Regional and Local * Freight Generation and Freight Trip Generation * Forecasting of freight trip generation; Modelling Inter-Regional Freight Demand with Input–Output, Gravity and Spatial Computable General Equilibrium (SCGE) Models * Behavioral analysis of freight mode choice decisions * Multi-class traffic assignment; Aggregate-Disaggregate-Aggregate Model Systems * Analysis of Urban Freight * Use of GPS and Bluetooth Data for Freight Analysis * International best practices of freight models

Objectives

The primary objectives of the course are as follows:

- Familiarize the participants to the concept of freight travel demand modeling, and its distinction from passenger travel demand modeling.
- Develop capability among participants to conceptualize and apply the freight travel demand in the transportation planning process.
- Introduce the participants to practical problems and their solutions, through case studies and real life projects in freight travel demand modeling.
- Identify the input data required for model estimation and application, and how and where the requisite data may be obtained in an efficient and cost-effective manner in a developing country context
- Establish familiarity with course participants on strategies for implementing, adopting, and adapting the freight travel demand modeling in their developing country contexts and varying geographies

Modules	A: Travel Demand Modeling Basics and Advances: December 11 - 13 B: Behavioral Freight Travel Demand Modeling: December 14 - 19 Number of participants for the course will be limited to fifty.
You Should Attend If...	<ul style="list-style-type: none"> You are a transportation engineer/planner or research scientist interested in urban transportation planning/activity based modeling You are a student or faculty from academic institution interested in learning Activity based models and their application
Fees	Faculty (Internal and external) and Scientists: Rs. 2000/- Participants from Training Organizations / Industry / Consultancy firms: Rs. 5,000/- Students and Research Scholars: <ul style="list-style-type: none"> Without award of grade: Rs 1000/- With award of grade: Rs. 2000/- Participants from abroad: Students: USD 100 Other participants from abroad: USD 200 The registration fee includes instructional materials, tutorials, laboratory and computer use, free internet facility, working lunch, mid-sessions tea & snacks. Out station participants will be provided accommodation and boarding in the Institute Guest House in the campus on payment. The charges range from Rs.4000/- to Rs. 5000/- for the entire duration of the course.

The Faculty



Dr. Sabyasachee Mishra, is an assistant professor at University of Memphis, and Director of Graduate Studies at Intermodal Freight Transportation Institute (IFTI). IFTI is one of the four national University Transportation Centers (UTCs) in the United States. He has published over 100 articles in international journals and peer reviewed conference proceedings. In 2014 he was selected as American Society of Civil Engineers (ASCE) Excellence in Civil Engineering Education (ExCEED) fellow. He received scholarship to attend the National Science Foundation (NSF) sponsored 2014 Pan-American Advanced Studies Institute on Sustainable Urban Freight Systems (PASI-SUFS) in Bogota Columbia in 2014. He also own Massachusetts Institute of Technology (MIT) challenge question award on discrete choice modeling, in 2014. He is a registered Professional Engineer (P.E) in the state of Michigan.



Dr. Prasanta Kumar Bhuyan is an assistant professor at Transportation engineering division of department of Civil Engineering, NIT Rourkela, Odisha, India. He teaches courses at graduate (B. Tech.) and post graduate (M. Tech.) level for more than last five years. He has guided 16 students for their M. tech. thesis work and presently guiding four Ph.D. scholar. He has published over 30 articles in international journals and peer reviewed conference proceedings.