

Course

Transport Logistics Modeling

Date:	2, 16, 23 November & 7 December 2016
Time:	10.00 – 16.00 h.
Location:	Utrecht
Course leaders:	Prof. Lorant Tavasszy and Prof. Rob Zuidwijk
Days:	4
ECTS:	1 (attendance) / 4 (assignment)
TUD GS credits:	4 (attendance) / 5 (assignment)
Course fee:	Free for TRAIL/Beta/OML members, others please contact the TRAIL office
Registration:	www.rstrail.nl

Objective

The objective of this course is to provide advanced understanding of freight transport demand and supply models at the micro (company/chain) and macro (city/region/country/world) level.

Course description

We discuss the development and application of freight transport system models, in particular for predicting future freight transport demand, designing freight transport networks and supporting planning and execution of freight transport operations in supply chains. The focus is on methods and applications of modelling, less on solution techniques for optimization. The course uses examples from the domain of port logistics, city logistics and intermodal transport.

Assignment

The assignment will consist of two parts. The first part will be discussed and handed out on Day 1, and is due on Day 3. The second part will be discussed and handed out on Day 2, and is due on Day 4.

Program

Day 1 – November 2, 2016

Lecturer: Lorant Tavasszy

Freight demand modelling: Trade modelling, I/O, Gravity and SCGE models; choice modelling for inventory, transport modes and networks. Acquisition and treatment of data. Examples in models for worldwide flows, national freight systems, cities, port and hinterland (synchromodality). Introduction of assignment.

Day 2 – November 16, 2016

Lecturer: Lorant Tavasszy

Presentation and discussion of assignments and cases on freight demand modelling.

Day 3 – November 23, 2016

Lecturer: Rob Zuidwijk

Topics: Intermodal transportation networks, collaboration and information exchange, OR versus agent-based modeling in container drayage, green and secure global transportation

Day 4 – December 7, 2016

Lecturer: Rob Zuidwijk

Presentation and discussion of assignments and cases on green and secure supply chains and intermodality.

Course material

The reader contains the following scientific papers and book chapters:

- Lorant Tavasszy, Gerard de Jong (eds.), Modelling Freight Transport, Elsevier, 2013:
 - Chapter 1 Introduction to Freight Modelling
 - Chapter 2 Modelling Inter-Regional Freight Demand
 - Chapter 4 Models of Distribution Structures
 - Chapter 5 Inventory Theory and Freight Transport Modelling
 - Chapter 6 Mode Choice Models
 - Chapter 8 Urban Freight Models
 - Chapter 11 Comprehensive Versus Simplified Models
- Teodor Gabriel Crainic, Kap Hwan Kim (2007). Intermodal Transportation, In: Cynthia Barnhart and Gilbert Laporte, Editor(s), Handbooks in Operations Research and Management Science, Elsevier, Volume 14: 467-537. <http://www.sciencedirect.com/science/article/pii/S0927050706140086>
- Rob Zuidwijk and Albert Veenstra (2014). The Value of Information in Container Transport. Transportation Science. Published online. <http://dx.doi.org/10.1287/trsc.2014.0518>
- Albert Veenstra, Rob Zuidwijk and Eelco van Asperen (2012). The extended gate concept for container terminals: Expanding the notion of dry ports. Maritime Economics and Logistics 14: 14-32. <http://dx.doi.org/10.1057/mel.2011.15>
- Behzad Behdani, Yun Fan, Bart Wiegman, Rob Zuidwijk (2016). Multimodal schedule design for synchromodal freight transport systems. European Journal of Transport and Infrastructure Research 16(3): 424-444. <http://www.tbm.tudelft.nl/en/about-faculty/departments/engineering-systems-and-services/tlo-section/ejtir/back-issues/volume-16-2016/volume-16-issue-3/>

Methodology

Various freight transport demand and service design modeling techniques will be discussed.

Prerequisite

No prerequisites are required other than basic understanding of mathematical notions at university level. Please consult lecturers when in doubt.