

Book Review:

Juan de Dios Ortúzar and Luis G. Willumsen *Modelling Transport*¹

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This is the third edition of a well-known textbook. Since the success of the first edition, the number of changes has been kept relatively small. It is a very useful book, both for educational purposes and as a reference. There is a good balance between mathematical rigour and practical recommendations. Models are useless without good data and extensive preliminary descriptive analyses and all these three strands are dealt with extensively. Not only "nice" mathematical models, but also "ugly" brute-force models are treated, the latter well-established with (too?) down-to-earth practitioners. The intricate mathematical detail of every model is avoided to concentrate instead on the basic principles and the identification of each model's strengths and limitations. Finally, there are numerous "philosophical" observations and views on the role of transport in contemporary society by two long-term experienced and wise practitioners. Does anything remain to be desired? Of course. The original version of the book contained quite a number of errors and mistakes, probably to the desperation of beginning scholars. Furthermore, at the end of each chapter a small number of useful exercises is included, but these are definitely not paper - and - pencil exercises, and it is not always clear beforehand which instruments are needed to solve them. Finally, what I would like to see is a more complete description of public transport assignment, because this is not only useful for public transport, but also for wider application as in airline transport and airport choice.

¹ Ortúzar., Juan de Dios and Luis G. Willumsen
Modelling Transport, 3rd ed.
Chichester (UK): John Wiley & Sons
2001
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499 pages

The *Introduction* goes into the particularly nature of transport problems (e.g. normally no stock formation, lumpiness of transport infrastructure) and decision making. Also, the concepts of aggregate and disaggregate modelling, cross-section and time series models, and revealed and stated preference are presented.

Chapter 2 deals with the mathematical prerequisites, standard textbook material to make the book self-contained. *Chapter 3* goes into data and space, network and zoning systems, sampling theory with special reference to the transport context (particularly choice-based sampling is very common in transport), origin-destination matrices and the problems to fill the cells of these, stated preference surveys, and longitudinal surveys.

Chapters 4, 5, and 6 present the traditional aggregate model and its submodels for generation, distribution, and modal split. *Chapter 7* starts with the disaggregate models: multinomial logit, hierarchical logit (and the simultaneous estimation method of the ALOGIT program), multinomial probit, and mixed logit (in which the coefficients are not fixed, but vary with individual tastes, and which is "the model for the new millennium" in the view of the authors). *Chapter 8* is concerned with specification and estimation of disaggregate models and with models for stated-preference data. *Chapter 9* treats the aggregation of disaggregate models and the difficult practical problem of model transferability.

Chapters 10 and 11 deal with route searching and assignment, categorised by yes/no multiple routing and yes/no congestion. A new section has been added on departure time choice and assignment by time-of-day period, extremely important from the policy point of view, e.g. relating to road pricing issues.

Chapter 12 is concerned with simplified transport demand models (which are definitely not simple from the conceptual viewpoint!). Because of lack of observed data, particularly to fill large origin-destination matrices, one or another form of simplified modelling will always be needed in practical studies.

Chapter 13 treats other important topics: freight modelling, forecasting land use variables (basically population and employment), car ownership forecasting, and the value of travel time.

A number of new items in the third edition have already been mentioned above. The most important items in "what's new?" are:

- The relationship between trip generation and accessibility: does better accessibility lead to more trips?
- Simultaneous estimation of several nests in the hierarchical logit model
- Multinomial probit, also in relation to panel data models
- Mixed logit
- Estimation of multinomial probit, using the Clark approximation or simulated maximum likelihood
- Departure time choice and assignment
- Car ownership forecasting using international comparisons

Altogether a book which should be present on the shelf of every theoretical modeller and practitioner.