

Announcement: PhD Defence of Bart van Riessen

Optimal Transportation Plans and Portfolios for Sychromodal Container Networks

March 22, 2018, 13.30. Erasmus University Rotterdam

Location: [Senate Hall, Erasmus Building, Woudestein Campus](#)

In his dissertation Bart van Riessen studies the operational implementation of sychromodality, a concept for container transportation that combines service differentiation with integrated network planning.

Over 5 decades, container transportation has increased enormously. Many individual stakeholders (cities, transport companies) aim to create intermodal corridors in order to attract logistics business from the deep-sea port to their region. However, each separate development of an intermodal train or vessel corridor has limited potential and can only compete with flexible and reliable container trucks on longer distances.

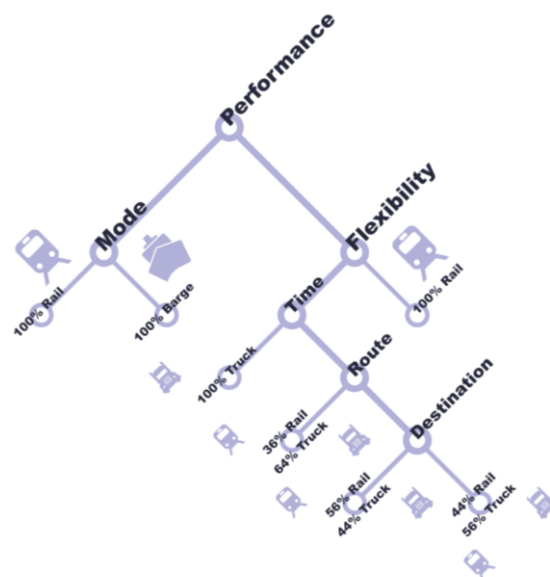
Instead, intermodal trains and inland vessels should compete by creating truly integrated network operation with multiple corridors. In his dissertation, Bart van Riessen shows that significant cost savings can be attained by integrated planning and operation of intermodal networks. To do so is not straightforward in practice as integrated operation is blocked by opportunistic behaviour by customers: every customer wants the best slot for his container, impeding the efficient operation of network operator.

In answer to this problem, the dissertation studies a sychromodal operation of container networks. With *sychromodality*, the transportation business model is changed to make sure that both customers and operators benefit. A customer can order a fast 'Express' transportation for a small premium. Alternatively, for a lower price the customer can get a 'Standard' transportation that takes a little longer. This not only serves customers better, the research shows for the case of European Gateway Services that the transportation operator can realise a more efficient operation and improve reliability at the same time. Sychromodality has been studied for approximately 7 years and now, around the time of publication of this thesis, the company starts with a pilot to implement the new business model.

The research was funded by

About the author

Bart van Riessen obtained a Master degree in Mechanical Engineering from TU Delft and a Master degree in Econometrics from Erasmus University Rotterdam (EUR), both in 2013. Afterwards, he started in a part-time position at ECT on hinterland developments and in a separate position at the Econometric Institute (Erasmus University Rotterdam) for his Ph.D. research under the supervision of Prof.dr.ir. Rommert Dekker (Econometric Institute) and Prof. dr. Rudy R. Negenborn (Dept. of Maritime and Transport Technology, TU Delft). His aim is to bridge the gap between academic transportation research and the transportation and logistics industry.



Abstract of the dissertation by Bart van Riessen

The dissertation proposes an integrated approach for optimising synchromodal container transportation, motivated by two separate trends in the container transportation practice in North-West Europe. On the one hand, competition in hinterland transportation and a societal need for a modal shift towards sustainable modes require more integrated network optimisation of container transports. On the other hand, hinterland users increasingly require a cost-effective, but flexible and reliable delivery service. The concept of synchromodality was developed as an answer to these developments, combining network planning with a business model based on customer-oriented transportation services. This dissertation contributes to this concept by bringing together optimal transport planning in intermodal networks and the design of an optimal fare class mix of customer-oriented services. It includes five new models for operating such a synchromodal transportation network: service network design, disturbance analysis, real-time decision support and two variants of the cargo fare class mix design. All models are developed with the perspective of a centralised operator in an intermodal container network, with scheduled services between a deep-sea terminal and multiple inland ports. These scheduled services can be trains or barges, but not necessarily both have to be available. All five models have been applied to case studies based on the intermodal container network of European Gateway Services (EGS), a subsidiary of Hutchison Ports ECT Rotterdam (ECT). The results show that both an integrated planning of container networks and a differentiated service portfolio are crucial for successful synchromodal network operation.

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