Speed Optimization in Liner Shipping Network Design

In the Liner Shipping Network Design Problem (LSNDP) services sail at a given speed throughout a round trip. In reality most services operate with a speed differentiated head- and back-haul, or even individual speeds on every sailing between two ports. The speed of a service is decisive for the bunker consumption in the network as well as the transit time of cargo. Speed optimization has been considered for tramp shipping showing significant reductions in fuel consumption. However, variable speeds has not been considered for post optimization of the LSNDP, where speed optimization could result in changes to the cargo flow due to transit time restrictions as well as significant savings in fuel consumption and required vessel deployment due to a weekly frequency requirement. We present a heuristic method to calculate variable speed on a service and present computational results for improving a solution of the LSNDP with average speeds to a solution with variable speed. We analyze the results according to transit time, fuel consumption and vessel deployment.

General information
State: Published
Organisations: Department of Management Engineering, Management Science
Contributors: Brouer, B. D., Karsten, C. V., Pisinger, D.
Publication date: 2015
Peer-reviewed: Yes
Event: Abstract from 27th European Conference on Operational Research, Glasgow, United Kingdom.
Research output: Research - peer-review » Conference abstract for conference – Annual report year: 2015