A Matheuristic for the Liner Shipping Network Design Problem with Transit Time Restrictions

We present a mathematical model for the liner shipping network design problem with transit time restrictions on the cargo flow. We extend an existing matheuristic for the liner shipping network design problem to consider transit time restrictions. The matheuristic is an improvement heuristic, where an integer program is solved iteratively as a move operator in a large-scale neighborhood search. To assess the effects of insertions/removals of port calls, flow and revenue changes are estimated for relevant commodities along with an estimation of the change in the vessel cost. Computational results on the benchmark suite LINER-LIB are reported, showing profitable networks for most instances. We provide insights on causes for rejecting demand and the average speed per vessel class in the solutions obtained.

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Contributors: Brouer, B. D., Desaulniers, G., Karsten, C. V., Pisinger, D.
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