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This paper presents the flexible containership loading problem for seaport container terminals. The integrated management of loading operations, planning of the transport vehicles to use and their scheduling is what we define as the Flexible Ship Loading Problem (FSLP). The flexibility comes from a cooperative agreement between the terminal operator and the liner shipping company, specifying that the terminal has the right to decide which specific container to load for each slot obeying the class-based stowage plan received from the liner. We formulate a mathematical model for the problem. Then we present various modelling enhancements and a mathematical model to obtain strong lower bounds. We also propose a heuristic algorithm to solve the problem. It is shown that enhancements improve the performance of formulation significantly, and the heuristic efficiently generates high-quality solutions. Results also point out that substantial cost savings can be achieved by integrating the ship loading operations.

General information
State: Published
Organisations: Department of Management Engineering, Management Science, Operations Research, Transport DTU
Contributors: Iris, Ç., Christensen, J., Pacino, D., Røpke, S.
Pages: 113-134
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Transportation Research. Part B: Methodological
Volume: 111
ISSN (Print): 0191-2615
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 5.09 SJR 3.109 SNIP 2.607
Web of Science (2017): Impact factor 4.081
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.57 SJR 2.844 SNIP 2.477
Web of Science (2016): Impact factor 3.769
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 5.15 SJR 3.149 SNIP 2.84
Web of Science (2015): Impact factor 3.769
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 4.21 SJR 3.054 SNIP 3
Web of Science (2014): Impact factor 2.952
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 4.64 SJR 3.223 SNIP 3.47
Web of Science (2013): Impact factor 3.894
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 3.3 SJR 3.22 SNIP 3.181
Web of Science (2012): Impact factor 2.944
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 3.82 SJR 2.93 SNIP 3.536
Web of Science (2011): Impact factor 2.856
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2 SNIP 2.832
Web of Science (2010): Impact factor 2.091
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.383 SNIP 3.049
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.407 SNIP 2.904
Scopus rating (2007): SJR 2.245 SNIP 3.071
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.296 SNIP 3.26
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.92 SNIP 2.959
Scopus rating (2004): SJR 2.199 SNIP 2.315
Scopus rating (2003): SJR 1.574 SNIP 2.18
Scopus rating (2002): SJR 2.323 SNIP 2.44
Scopus rating (2001): SJR 1.602 SNIP 1.924
Scopus rating (2000): SJR 1.189 SNIP 2.217
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.179 SNIP 2.288
Original language: English
Keywords: Container terminals, Mega vessels, Ship loading, Shipping lines and port collaboration, Stowage planning, Transport operations in yard
DOIs:
10.1016/j.trb.2018.03.009
Source: FindIt
Source-ID: 2397723666
Research output: Research - peer-review › Journal article – Annual report year: 2018