Author’s Accepted Manuscript

Design-balanced Capacitated Multicommodity Network Design with Heterogeneous Assets

Xiangyong Li, Kai Wei, Y.P. Aneja, Peng Tian

PII: S0305-0483(16)30179-7
DOI: http://dx.doi.org/10.1016/j.omega.2016.05.001
Reference: OME1672

To appear in: Omega

Received date: 23 June 2015
Revised date: 10 March 2016
Accepted date: 3 May 2016

Cite this article as: Xiangyong Li, Kai Wei, Y.P. Aneja and Peng Tian, Design-balanced Capacitated Multicommodity Network Design with Heterogeneous Assets, Omega, http://dx.doi.org/10.1016/j.omega.2016.05.001

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.
Design-balanced Capacitated Multicommodity Network Design with Heterogeneous Assets

Xiangyong Li  
School of Economics & Management, Tongji University, Shanghai 200092, China, xyli@tongji.edu.cn

Kai Wei  
School of Economics & Management, Tongji University, Shanghai 200092, China, 0359weikai@tongji.edu.cn

Y.P. Aneja  
Odette School of Business, University of Windsor, Windsor, Ontario, Canada, aneja@uwindsor.ca

Peng Tian  
Antai College of Economics & Management, Shanghai Jiao Tong University, Shanghai 200052, China, ptian@sjtu.edu.cn

Management of assets plays an essential role in determination of service plans operated by carriers in the transportation and logistics system. In this paper, we introduce certain issues related to management of heterogeneous assets in the well-known design-balanced capacitated multicommodity network design, where design-balanced requirements are explicitly defined based on heterogeneous assets.

Taking vehicles as an example of heterogeneous assets, we first present an arc-based formulation for the proposed problem and discuss two associated subproblems. We then propose a tabu search based metaheuristic for this problem. Over a wide range of network design instances, we respectively compare our approach with CPLEX with one-hour and ten-hour time limits. Computational results demonstrate that the proposed approach performs very well in terms of solution quality and computing time, especially for large instances.

Key words: service network design; design-balanced constraints; heterogeneous assets; tabu search; heuristic

1. Introduction
Freight transportation is one of the most important and complex industries in a modern economy. Freight volumes to be transported are increasing, as are expectations of customers in terms of quality of service and cost of providing service (vehicle cost, energy prices, fixed cost, etc.). Thus, reducing transportation costs and satisfying transportation demands are vital tasks for carriers in transportation and logistics systems.

Service network design (SND) formulations are used to model a wide variety of decision problems in the transportation and logistics system. Typically, the SND models address decisions related to planning, selection and eventually, scheduling of services in consolidation-based transportation systems (Pedersen et al. 2009). In SND formulations,
دریافت فوری متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات