Shuttle Planning for Link Closures in Urban Public Transport Networks - DTU Orbit
(03/10/2019)

**Shuttle Planning for Link Closures in Urban Public Transport Networks**

Urban public transport systems must periodically close certain links for maintenance, which can have significant effects on the service provided to passengers. In practice, the effects of closures are mitigated by replacing the closed links with a simple shuttle service. However, alternative shuttle services could reduce inconvenience at a lower operating cost. This paper proposes a model to select shuttle lines and frequencies under budget constraints. We propose a new formulation that allows a minimal frequency restriction on any line that is operated and minimizes passenger inconvenience cost, which includes transfers and frequency-dependent waiting time costs. This model is applied to a shuttle design problem based on a real-world case study of the Massachusetts Bay Transportation Authority network of Boston, Massachusetts. The results show that additional shuttle routes can reduce passenger delay compared to the standard industry practice, while also distributing delay more equally over passengers, at the same operating budget. The results are robust under different assumptions about passenger route choice behavior. Computational experiments show that the proposed formulation, coupled with a preprocessing step, can be solved faster than prior formulations.

**General information**
Publication status: Published
Organisations: Department of Management Engineering, Management Science, Transport DTU, Erasmus University Rotterdam, Northeastern University, Massachusetts Institute of Technology, University of Amsterdam
Contributors: van der Hurk, E., Koutsopoulos, H. N., Wilson, N., Kroon, L. G., Maroti, G.
Number of pages: 19
Pages: 947-965
Publication date: 2016
Peer-reviewed: Yes

**Publication information**
Journal: Transportation Science
Volume: 50
Issue number: 3
ISSN (Print): 0041-1655
Ratings:
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.69 SJR 2.564 SNIP 2.383
Web of Science (2016): Impact factor 3.275
Web of Science (2016): Indexed yes
Original language: English
Keywords: Shuttle planning, Disruption management, Line planning, Public transport
Electronic versions:
LinePlanning_Anonymous_template.pdf. Embargo ended: 03/08/2017
DOIs: 10.1287/trsc.2015.0647
Source: FindIt
Source ID: 2303368220
Research output: Contribution to journal › Journal article – Annual report year: 2016 › Research › peer-review