Evaluating and optimizing resilience of airport pavement networks - DTU Orbit (16/10/2018)

Evaluating and optimizing resilience of airport pavement networks

This paper addresses the problem of assessing and maximizing the resilience of an airport's runway and taxiway network under multiple potential damage-meteorological scenarios. The problem is formulated as a stochastic integer program with recourse and an exact solution methodology based on the integer L-shaped decomposition is proposed for its solution. The formulation seeks an optimal allocation of limited resources to response capabilities and preparedness actions that facilitate them. The overall aim is to quickly restore post-event takeoff and landing capacities to pre-event operational levels taking into account operational, budgetary, time, space, and physical resource limitations. Details, such as aircraft size impacts, reductions in capacity due to joint takeoff and landing maneuvers on common runways or bidirectional flows on taxiways, potential for outsourcing repair work, and multi-team response, are incorporated. The mathematical model and solution methodology are embedded within a decision support tool, the capabilities and applicability of which are demonstrated on an illustrative case study. Potential benefits to airport operators are described, including, for example: the tool's utility in suggesting equipment to have at the ready, identifying the critical pavement system components, and vulnerabilities for prioritizing future facility developments.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Geotechnics and Geology, University of Maryland, Technion-Israel Institute of Technology
Contributors: Faturechi, R., Levenberg, E., Miller-Hooks, E.
Pages: 335-348
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Computers & Operations Research
Volume: 43
ISSN (Print): 0305-0548
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 3.75 SJR 1.916 SNIP 2.094
Web of Science (2017): Impact factor 2.962
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.77 SJR 2.299 SNIP 2.192
Web of Science (2016): Impact factor 2.6
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 3.09 SJR 1.924 SNIP 2.048
Web of Science (2015): Impact factor 1.988
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 3.12 SJR 2.225 SNIP 2.309
Web of Science (2014): Impact factor 1.861
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 3.62 SJR 2.527 SNIP 2.93
Web of Science (2013): Impact factor 1.718
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 3.36 SJR 2.727 SNIP 2.775
Web of Science (2012): Impact factor 1.909
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 3.05 SJR 2.41 SNIP 2.449
Web of Science (2011): Impact factor 1.72
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.316 SNIP 2.449
Web of Science (2010): Impact factor 1.769
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 2.28 SNIP 2.389
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 2.199 SNIP 2.287
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.976 SNIP 2.523
Web of Science (2007): Indexed yes
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.157 SNIP 2.009
Scopus rating (2004): SJR 1.003 SNIP 1.706
Scopus rating (2003): SJR 1.058 SNIP 1.677
Scopus rating (2002): SJR 0.85 SNIP 1.441
Scopus rating (2001): SJR 1.069 SNIP 1.095
Scopus rating (2000): SJR 0.931 SNIP 0.878
Scopus rating (1999): SJR 0.862 SNIP 0.879
Original language: English
Keywords: Airport safety and security, Pavement, Resilience, Stochastic optimization, Rapid Runway Repair, Taxiway and runway network
DOIs:
10.1016/j.cor.2013.10.009
Research output: Research - peer-review › Journal article – Annual report year: 2014