

Congestion reduction through efficient container movement under stochastic demand Dataset

Dataset available at: <https://doi.org/10.5061/dryad.mcvdncjxf>

(This dataset supports report **Congestion reduction through efficient container movement under stochastic demand**, <https://doi.org/10.7922/G2W09464>)

This U.S. Department of Transportation-funded dataset is preserved by the California Department of Transportation in the digital repository Dryad (<https://datadryad.org>), and is available at <https://doi.org/10.5061/dryad.mcvdncjxf>.

The related final report **Congestion reduction through efficient container movement under stochastic demand**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/53901>.

Metadata from the Dryad Repository record:

Abstract:

In today's world, there is a significant amount of investigation regarding how to efficiently distribute loaded containers from the ports to the consignees. However, to fully maximize the process and become more environmentally friendly, one should also study how to allocate the empty containers created by these consignees. This is an essential part in the study of container movement since it balances out the load flow at each location.

The problem of coordinating the container movement to reuse empty containers and lower truck miles is called the "Empty Container Problem". In this work, we develop a scheduling assignment for loaded and empty containers that builds on earlier models but incorporates stochastic (random) future demand. It is worth mentioning that in the previous research [5], the empty container problem was divided into two subproblems, including an assignment problem and a vehicle routing problem (VRP).

The previous research only considered the problem as a one-day horizon. But in reality, the container movements are not only to fulfill today's demand at each location but also prepare for the next day's delivery. Thus, incorporating future demand is an essential aspect of the problem.

By considering the future demand, a better solution can be constructed compared to solving the problem as a one-day horizon problem. This report shows that the truck miles needed to satisfy the demand at all locations is reduced by about 4-7% when considering future stochastic demand as opposed to only considering today's demand, thus, leading to a cleaner and greener solution, creating less congestion and lowering the impact of freight movement on the environment.

Methods

The data is mostly randomly generated data sets and demand data for containers near the San Pedro Ports.

Usage Notes

Data set includes a readme file.

Funding

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Recommended citation:

Dessouky, Maged (2020), Data from: Congestion reduction through efficient container movement under stochastic demand, Dryad, Dataset, <https://doi.org/10.5061/dryad.mcvdncjxf>

Dataset description:

This dataset contains 1 .zip file collection described below.

Metrans_Data_File_NCST_Updated.zip:

This collection contains ten files and 4 files types, listed below.

- .docx: The .docx file is a Microsoft Word file, which can be opened with Word and other free word processor programs, such as Kingsoft Writer, OpenOffice Writer, and ONLYOFFICE.
 - Data_Management_Plan.docx
- .txt: The .txt file type is a common text file, which can be opened with a basic text editor. The most common software used to open .txt files are Microsoft Windows Notepad, Sublime Text, Atom, and TextEdit (for more information on .txt files and software, please visit <https://www.file-extensions.org/txt-file-extension>).
 - readMe.txt
- .xlsx: The .xlsx file is a Microsoft Excel file, which can be opened with Excel, and other free available software, such as OpenRefine.
 - RL_DD.xlsx
 - RL_parameters.xlsx
 - SPPS_DD.xlsx
 - SPPS_DistM.xlsx
 - SPPS_parameters.xlsx
 - Stochastic_full_model_results.xlsx
 - TP.xlsx
- .jpg: The jpg file extension is associated with JPEG (Joint Photographic Experts Group) file format, (for more information on .jpg files and software, please visit <https://www.file-extensions.org/jpg-file-extension>).
 - SPPS_Physical_Locations.jpg

National Transportation Library (NTL) Curation Note:

As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (<https://doi.org/10.21949/1503647>) Section 7.4.2 Data, the NTL staff has performed *NO* additional curation actions on this dataset.

NTL staff last accessed this dataset at <https://doi.org/10.5061/dryad.mcvdncjxf> on 2020-12-07.

If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.