

## Abstract

Shuttle-based storage and retrieval system (SBS/RS) is relatively a new automated storage and retrieval technology developed as an alternative to the mini-load crane-based automated storage and retrieval system (AS/RS). It is important to have analytical models calculating critical performance measures promptly facilitating selection of the right warehouse design meeting the requirements of the company. The aim of this study is to present an open queuing network (OQN) model that can estimate the critical performance measures of a pre-defined SBS/RS design. The estimated performance measures are considered to be the mean waiting time of a transaction and the mean number of transactions waiting in the server of queues as well as the mean utilization of the servers. By the provided model, one would be able to evaluate an SBS/RS' design promptly, by changing those design criteria.