

Impact Of Semi-Trailer Scheduling On Cross Docking Platform Efficiency^{*}

Mohammad Yousef MAKNOON^a, Pierre BAPTISTE^a

^a *École Polytechnique de Montréal, Montréal*

Abstract

Cross-docking is a transshipment platform used in logistics network to reduce network operational costs. In this paper we investigate the scheduling problem in a typical platform. Specifically, our objective is to synchronize the products flow inside the platform. Tabu search integrated with branching path algorithm is used as a resolution approach for this problem. Several instances are tested with the proposed algorithm. The results indicate that the platform's efficiency highly depends on semi-trailer sequences and products loading and unloading policy and a proper scheduling system could significantly improve the platform efficiency.

Key words: Logistics, Semi-trailer sequencing, loading/unloading policy, branch and bound, Tabu search

1 Introduction

Receiving, storage, order picking and shipping are the warehouse's major functions. Among these functions, order picking and storage are expensive which make the warehousing a costly activity in the logistics network. Therefore, in order to reduce costs, companies have a trend to use cross docking in logistics network.

Cross docking is defined as a transshipment platforms that receives products from several suppliers for several delivery destinations, and regroup the products as per their common destinations [1]. As presented in Figure 1, generally the platform consists of three major sections: receiving area, storage and shipping area. Cross docking has the ability to consolidate several receiving products in order to have fully loaded semi-trailer which makes it economically beneficial to use in supply chain [2]. However, these benefits could be achieved through the efficient platform implementation which consists of efficient usage of semi-trailer capacity (i.e. full loads), the efficient product flow, and the implementation of a good scheduling system [3].

To achieve these benefits, it is essential to maintain a proper scheduling system for the entire network and for each platform, these systems highly depend on the network types and the platform functions. In the following we discuss some of these characteristics:

^{*} This paper was not presented at any other revue. Corresponding author P. Baptiste Tel. 514-340-4998, Fax 514-340-4173
Email addresses: pierre.baptiste@polymtl.ca (Pierre Baptiste), mohammad-yousef.maknoon@polymtl.ca (Mohammad Yousef Maknoon).