

Optimization of operations in storage areas of a seaport vehicle terminal

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The last vehicle marketing strategies in the world market tend to store a huge quantity of vehicles in seaport terminals. This vehicle storage causes several space problems in the existing facilities in ports around the globe. Also, these space problems can cause severe problems of congestion at terminals. For this reason, an improvement of tasks must be achieved to reduce the inefficiency of the system.

Seaport vehicle terminals are one of the junctions in the logistic chain of import vehicles. This market is controlled by a few big logistic service providers and one of the main goals they achieve is to reduce operating costs of the terminals. Moreover, the interaction between these logistic service providers and its clients (manufacturers and consumers) has to be taken into account by offering a reliable service.

In a vehicle terminal there are lots of different tasks that operators have to execute. Transportation, transshipment and storage of the vehicles are the main ones, and all three are related to vehicle movements between different parts of the terminal. The purpose of this dissertation is to study these vehicle movements produced in the import process. There are two types of different movements that are going to be treated. The first types of movements are related to the transportation of vehicles from the incoming buffer to the storage import terminal. The second types of movements are the relocations of vehicles done inside the storage locations.

The storage operations suppose an important workload for the hired drivers in a terminal. For this reason, this dissertation will propose several allocation strategies to minimize the sum of working hours for the driving personnel inside the storage location given some predetermined space restrictions. Furthermore, the vehicle relocation tasks are inefficient because they are not paid by costumers and also for the increase of damage ratio in vehicles due to excessive movements around the storage location.

The evaluation of these allocation strategies and the design of different scenarios (ship arrivals and vehicle departures) from the terminal will achieve the main goal of quantifying the cost surcharge of these inefficient activities in the terminal. Also, the logistic service providers will be given different tools to determine the actual situation of their storage locations that will help them anticipate inefficiencies in the relocation tasks that will have to be done.