

ABSTRACT

PT XYZ is a 4PL company engaged in handling fast food restaurant supply chains in Indonesia, where the distribution of goods is carried out from the distribution center (DC) and then distributed to fast food outlets using multi-compartment vehicles. In using the fleet, the company faces the problem of low vehicle utilization, so this study will design the use of the fleet by separating the distribution of goods using a single-compartment fleet. The problems to be studied can be categorized into VRP variants of multi-compartment VRP with limitations, that is, capacity, time window, multi-product, and split delivery. To solve these problems, in this study used an exact approaches, namely mixed-integer linear programming (MILP) with the use of Gurobi solver in data processing. The results show that with the method used and with the proposed design, vehicle utilization can increase up to 13% of existing vehicles.

Keywords: Vehicle Routing Problem, Mixed-Integer Linear Programming, Multi-Compartment, Time Window.