

ABSTRACT

Banjar Tegeh Sari Waste Management Unit is one of the units that provide waste collection services in The Banjar Tegeh Sari area. Currently, there are several challenges faced by this waste management unit, namely the large number of customers, the vast area and the fluctuating amount of customer waste. This challenge has resulted in the fuel costs incurred for the waste vehicles exceeding the limit by an average of 17.78% of the previously set budget. After further analysis, there are several causes of the problem, namely the absence of work SOPs related to waste transportation routes, intuitive route determination and limited fleet and capacity. The solution search will use the genetic algorithm method. Genetic algorithms are algorithms classified as metaheuristic algorithms that have the advantage of producing solutions close to the global optimum with many points customers in a shorter time when compared to exact methods. A brute force approach will be used to evaluate each possible route formed to improve the solution obtained. The results of finding solutions using this hybrid genetic algorithm method can minimize fuel costs on waste vehicles. The total fuel cost that can be reduced monthly using this vehicle route design is 30.43% or Rp225.189 compared to the existing conditions. The resulting cost reduction can also provide a space of 14.20% or around Rp85.189 from the budget.

Keywords: Vehicle Routing Problem, Brute Force Approach, Genetic Algorithm