

A Comparative Analysis of Heuristics Applied to Collecting Used Lubricant Oils Generated in the City of Pereira, Colombia

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Abstract : Currently, in Colombia is arising a problem related to collecting used lubricant oils which are generated by the increment of the vehicle fleet. This situation does not allow a proper disposal of this type of waste, which in turn results in a negative impact on the environment. Therefore, through the comparative analysis of various heuristics, the best solution to the VRP (Vehicle Routing Problem) was selected by comparing costs and times for the collection of used lubricant oils in the city of Pereira, Colombia; since there is no presence of management companies engaged in the direct administration of the collection of this pollutant. To achieve this aim, six proposals of through methods of solution of two phases were discussed. First, the assignment of the group of generator points of the residue was made (previously identified). Proposals one and four of through methods are based on the closeness of points. The proposals two and five are using the scanning method and the proposals three and six are considering the restriction of the capacity of collection vehicle. Subsequently, the routes were developed - in the first three proposals by the Clarke and Wright's savings algorithm and in the following proposals by the Traveling Salesman optimization mathematical model. After applying techniques, a comparative analysis of the results was performed and it was determined which of the proposals presented the most optimal values in terms of the distance, cost and travel time.

Keywords : Heuristics, optimization Model, savings algorithm, used vehicular oil, V.R.P.

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