

## Distribution Routs Redesign through the Vehicle Problem Routing in Havana Distribution Center

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**Abstract :** Cuban business and economic policy are in the constant update as well as facing a client ever more knowledgeable and demanding. For that reason become fundamental for companies competitiveness through the optimization of its processes and services. One of the Cuban's pillars, which has been sustained since the triumph of the Cuban Revolution back in 1959, is the free health service to all those who need it. This service is offered without any charge under the concept of preserving human life, but it implied costly management processes and logistics services to be able to supply the necessary medicines to all the units who provide health services. One of the key actors on the medicine supply chain is the Havana Distribution Center (HDC), which is responsible for the delivery of medicines in the province; as well as the acquisition of medicines from national and international producers and its subsequent transport to health care units and pharmacies in time, and with the required quality. This HDC also carries for all distribution centers in the country. Given the eminent need to create an actor in the supply chain that specializes in the medicines supply, the possibility of centralizing this operation in a logistics service provider is analyzed. Based on this decision, pharmacies operate as clients of the logistic service center whose main function is to centralize all logistics operations associated with the medicine supply chain. The HDC is precisely the logistic service provider in Havana and it is the center of this research. In 2017 the pharmacies had affectations in the availability of medicine due to deficiencies in the distribution routes. This is caused by the fact that they are not based on routing studies, besides the long distribution cycle. The distribution routs are fixed, attend only one type of customer and there respond to a territorial location by the municipality. Taking into consideration the above-mentioned problem, the objective of this research is to optimize the routes system in the Havana Distribution Center. To accomplish this objective, the techniques applied were document analysis, random sampling, statistical inference and tools such as Ishikawa diagram and the computerized software's: ArcGis, Osmand y MapInfo. As a result, were analyzed four distribution alternatives; the actual rout, by customer type, by the municipality and the combination of the two last. It was demonstrated that the territorial location alternative does not take full advantage of the transportation capacities or the distance of the trips, which leads to elevated costs breaking whit the current ways of distribution and the currents characteristics of the clients. The principal finding of the investigation was the optimum option distribution rout is the 4th one that is formed by hospitals and the join of pharmacies, stomatology clinics, polyclinics and maternal and elderly homes. This solution breaks the territorial location by the municipality and permits different distribution cycles in dependence of medicine consumption and transport availability.

**Keywords :** computerized geographic software, distribution, distribution routs, vehicle problem routing (VPR)

**Conference Title :** ICTLT 2018 : International Conference on Transportation and Logistics Technology

**Conference Location :** Vienna, Austria

**Conference Dates :** June 14-15, 2018