

A Comparison of Ambulance Location Models in Two Mexican Cases

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Abstract

The development of several ambulance location models have been discussed in the academic literature. Most of these models have been further extended to consider more realistic situations into account and the use of different assessment criteria. However, there is not an exhaustive literature that takes the existing standard models to compare them according to the criteria used in practice. In this work, we undertake the task of comparing the performance of several ambulance location models on coverage and response time criteria. The results of this work are important to help emergency medical organizations to define their most adequate model for defining their ambulance base structure. The comparison of the models is carried out on two Mexican emergency operations of the Red Cross located in the cities of Tijuana and Monterrey.

Keywords

Ambulance location; response time; demand covering; ambulance availability

Biographies

Edgar Aurelio Marco Granda is a full professor of the Department of Engineering of the Universidad de Monterrey. He holds a PhD of Industrial Engineering from ITESM. He has 18 years of professional experience in logistics, operations and supply chain in several Mexican companies. He has taught for 5 years courses on industrial engineering and logistics in the Universidad de Monterrey, ITESM, UMIN and Universidad Autónoma de Nuevo León. As a consultant, he has carried out projects on logistics and supply chain for different company in México.

Bernardo Villarreal is a full professor of the Department of Engineering of the Universidad de Monterrey. He holds a PhD and an MSc of Industrial Engineering from SUNY at Buffalo. He has 20 years of professional experience in strategic planning in several Mexican companies. He has taught for 20 years courses on industrial engineering and logistics in the Universidad de Monterrey, ITESM and Universidad Autónoma de Nuevo León. He has made several publications in journals such as Mathematical Programming, JOTA, JMMA, European Journal of Industrial Engineering, International Journal of Industrial Engineering, Production Planning and Control, International Journal of Logistics Research and Applications, Industrial Management and Data Systems and the Transportation Journal. He is currently a member of the IIE, INFORMS, POMS and the Council of Logistics Management.

Gabriela Morales is a CUM LAUDE Industrial Engineer just graduated from Universidad de Monterrey (UDEM). She has participated on several projects such as the Improvement of the routing operations of a leading convenience store firm. She also applied Lean Thinking principles for Improving the Productivity of several metal assembly lines for a Mexican metal mechanic company. Currently, she has started to work at a Mexican firm leader in the manufacturing of frozen and refrigerated food as a transportation and traffic analyst. Gabriela is a member of the IIE and ASQ Societies.