

A reconfiguration of fire station and fleet locations for the Santiago Fire Department

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Abstract

The geographical distribution of the population of the city of Santiago, Chile, has changed significantly in recent years. In spite of this fact, the location of the fire stations has remained unchanged. We propose a model for the optimal location of the fire stations and a fleet assignment for the Santiago Fire Department (SFD), aimed at maximising the number of events attended to with a predefined standard response. The results of the model are compared with respect to the current location of fire stations and fleet assignment in the SFD. There are different types of resources (stations and vehicles), and different types of events in which the same types of vehicles are used. We analyse various possible current and future scenarios, using a forecast based on historical data. Our results show that by optimally reallocating the resources a 10–30% increase can be achieved in the number of emergency calls that are attended to with an adequate response in time and number of vehicles, without the need for additional fire stations or vehicles. Thus our contribution is empirical and relies on the real world application which is being considered by Chilean government..

Keywords

Fire stations, Fleet allocation, Probabilistic models.