Studying Solutions of the p-Median Problem for the Location of Public Bike Stations*

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Abstract—The use of bicycles as a means of transport is becoming more and more popular today, especially in urban areas, to avoid the disadvantages of individual car traffic. In fact, city managers react to this trend and actively promote the use of bicycles by providing a network of bicycles for public use and stations where they can be stored. Establishing such a network involves the task of finding best locations for stations, which is, however, not a trivial task. In this work, we examine models to determine the best location of bike stations so that citizens will travel the shortest distance possible to one of them. Based on real data from the city of Malaga, we formulate our problem as a *p*-median problem and solve it with a variable neighborhood search algorithm that was automatically configured with irace. We compare the locations proposed by the algorithm with the real ones used currently by the city council. We also study where new locations should be placed if the network grows.

Index Terms—Bike station location, *p*-Median problem, Variable neighborhood search