

# Strategies for locating charge points for electrical car batteries in urban regions

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The enormous potential of electric vehicles as an alternative for urban mobility is leading to various new, challenging research topics including the definition of strategies and tools to support the location of the equipments used for charging the car batteries. There are two different situations: fast and slow charging of batteries. Our research focus on the definition of strategies for locating charge points for this second situation.

In urban areas, users will be willing to charge their electrical vehicles while they are at home or at work.

Accordingly EDP (Electricidade de Portugal) intends to design a system of slow-charging equipments for the parking sites of residential and business areas, hotels, industrial parks, shopping areas and airports.

Defining the location of such equipments is a critical problem, involving multiple objectives related to investment and operational costs, along with service quality. To adequately model this problem, we first need to understand the characteristics of the equipments, and what will be the expected demand for these services.

Moreover our research includes establishing strategies for locating the battery charging infrastructure in order to meet the demand. These locations will be optimized taking into account the access time and distance from residential and work places, and the various costs involved in the set-up and operation of the system. For this purpose a multi-objective model will be developed and metaheuristic techniques are being developed as part of a more comprehensive decision support tool.

Different alternative policies will be formulated and assessed to implement such a system, aiming at providing a smooth, effective transition to better quality transportation services.

**Keywords:** urban mobility; electric vehicles; charge points for car batteries; multi-objective location problems; metaheuristics.