

# **Research on the problem of city medical waste vehicle routing optimization based on periodic strategy**

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**Abstracts:** As the population of the city increases, more medical activities are brought in, which can generate various kinds of medical wastes. The standard recovery of medical waste is beneficial to human health and the construction of green environment. However, it is resource-constrained when it comes to recovery method and vehicle routing and scheduling of medical waste in China. Currently, a once a day recycling strategy is adopted, which improves the recovery costs and increases resource consumption due to the large gap between city medical waste emissions. This paper focuses on the study of optimizing the vehicle routing problem of reverse logistics for urban medical waste according to the existing medical waste recycling system. At the same time, the current city medical waste recycling state is considered. We select the appropriate recovery site as the goal of distance optimization first, and afterward, classify waste recycling site according to the amount of waste. Meanwhile, multiple vehicles utilized according to actual situation. In this article, we structure the mathematical model to optimize the vehicle routes as the goal of reducing the total distance, considering periodically arranging the vehicle for recycling simultaneously. Finally, the mathematical model are solved with authentic data and compared with non-periodical recycling strategy. The results show that this method can effectively enhance the utilization of resources and recycling efficiency, protect the urban living environment, and achieve the win-win situation of economic and social benefits.

# 基于周期性策略的城市医疗废物车辆路径优化问题研究

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**摘要:** 随着城市人口的增加, 医疗活动也随之增加。医疗废物的规范回收, 有利于人类健康与绿色环境的构建。城市医疗点废物排放量差距较大, 目前采用一天一次回收策略, 提高了回收成本, 增加资源消耗, 缺乏有效的回收方法与车辆路径规划与规划策略。本文从优化城市医疗废物的逆向物流车辆行驶路径问题为中心, 根据现有医疗废物回收制度与考虑城市医疗废物回收现实情况。本文先以距离最优化为目标选择合适回收站点; 然后根据回收站点废物量划分等级, 采用不同周期安排车辆回收, 以车辆总行驶路程最短, 采用多车型方式建模求解。最后本文运用实际数据求解, 与不采用周期性回收策略对比, 结果显示该方法能有效提高回收效率与资源利用率, 减少回收成本, 保护城市居住环境, 实现经济效益与社会效益双赢的目的。