

A Comparison of the Transport Requirements of Different Curbside Waste Collection Systems in Denmark

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With an increased focus on recycling, local authorities need to adapt their systems for curbside collection of household waste to accommodate an increased degree of sorting of waste types. Therefore, it is essential to study the transport aspects of waste collection. In this paper, we analyze the driving requirements for curbside collection of household waste for different systems in the context of Denmark. We consider a Collect, then sort system, as opposed to two Sort, then collect systems using single and multi-compartment vehicles, and compare the systems among themselves, and to the collection for incineration system. The systems are modeled as single and multi-compartment capacitated arc routing problems and solved by a Multi-Move Chain Descent algorithm [2]. Based on the solution of 1256 instances in total, we compare the transport requirements in terms of driven distance and number of routes across systems. We present our findings and discuss the three identified cost drivers that affect the overall results: the change in the size of the vehicle, the compression factor inside the vehicles compartments, and the packing of the vehicles compartments. The presentation is based on [2].

References

- [1] H. Zbib and S. Wøhlk “A multi-move chain descent algorithm for large-scale arc routing problems in curbside waste collection”, Submitted, 2017.
- [2] H. Zbib and S. Wøhlk “A comparison of the transport requirements of different curbside waste collection systems in Denmark”, *Waste Management* 87, 21-32, 2019.