

Ph.D. Thesis
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The impact of waste management on spatial planning
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ABSTRACT

This thesis focuses on the spatial aspects of waste management. The increasing amount of waste undoubtedly imposes the need to reserve space for its collection, storage, sorting, treatment and disposal, including landfilling. The need to provide adequate space for waste already emerges at the waste generation level and increases at subsequent phases of waste treatment. Increasingly, there is a demand to keep the amount of mixed waste as minimal as possible, with a corresponding increase in the number of fractions collected separately, which impacts the area and place of collection. These measures are driven by the challenges set by the circular economy.

The work first outlines the research problem of waste management in relation to urban space. Various aspects of waste management, factors and trends affecting it in relation to the spatial context were analysed to recognise this issue. The technical and organisational, as well as socio and legal aspects of waste management in relation to the site and spatial conditions of the facilities required for its management were also identified. A large part of the study analyses selected examples of practices supporting the implementation of circular economy assumptions. The examples have been divided into three sub-groups - 1) collection sites, 2) processing and management sites and 3) a comprehensive approach in the context of a city. The exemplary solutions are all situated in Europe and have been selected following similar legal, economic, social and spatial conditions as in Poland.

The conclusions include syntheses of the conditions for the different types of waste collection and treatment systems concerning the types of residential development, providing practical indications for the future that can be applied in the search for solutions appropriate at the city scale. This part is summed up with a model of a waste management system linked to the structure of the city, allowing the minimisation of the waste generated through the proper distribution of collection and recycling points and municipal waste treatment and disposal facilities in space.

KEYWORDS: spatial planning, urban spatial structure, municipal solid waste, municipal solid waste management, circular economy, Europe

