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Review of city models and the applications on flood risk management

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Cities are the place where a large portion of the population lives. Traditional urban planning models usually based on separate functions of a city or region. A coherent city model is a newly developed tool to take the interaction between each section into consideration. The city model in this paper focuses on the water system infrastructure because flood risk is becoming an increasingly challenging issue with the rapid urbanization and extreme weather under climate change. The paper aims to give a timely review of the development of city models from various originates. Then, it introduces a number of popular modelling techniques that have been demonstrated useful or may be of potential usage for city modelling purpose, such as GIS, CIM, ABM, etc. The review of model techniques provides the readers with suggestions on how to choose the technique to deal with their own research question. After that, this paper also points out the possible future directions of city models with challenges requiring further research efforts.