

Travel Behavior Simulation of Bike-Sharing System Users in Kaoshiung City

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Abstract : In a Bike-sharing system (BSS), users can easily rent bikes from any station in the city for mid-range or short-range trips. BSS can also be integrated with other types of transport system, especially Green Transportation system, such as rail transport, bus etc. Since BSS records time and place of each pickup and return, the operational data can reflect more authentic and dynamic state of user behaviors. Furthermore, land uses around docking stations are highly associated with origins and destinations for the BSS users. As urban researchers, what concerns us more is to take BSS into consideration during the urban planning process and enhance the quality of urban life. This research focuses on the simulation of travel behavior of BSS users in Kaohsiung. First, rules of users' behavior were derived by analyzing operational data and land use patterns nearby docking stations. Then, integrating with Monte Carlo method, these rules were embedded into a travel behavior simulation model, which was implemented by NetLogo, an agent-based modeling tool. The simulation model allows us to foresee the rent-return behaviour of BSS in order to choose potential locations of the docking stations. Also, it can provide insights and recommendations about planning and policies for the future BSS.

Keywords : agent-based model, bike-sharing system, BSS operational data, simulation

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