Campus solar roads: Stochastic modeling of passenger demand

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In the era of rapid technological advancements, innovations have started to reshape the field of transportation and energy management. University Campuses are considered as the ideal venue for implementing and testing innovative transportation services, as they usually encompass a closed form small-scale transportation infrastructure, and mainly involve users highly receptive to emerging technologies, due to their academic background. Nevertheless, the assessment of such services is a complex task, which should take into consideration issues related to energy sufficiency, passengers' demand estimation and routing specifications. The present paper addresses the problem of stochastic passenger demand estimation under the uncertainties introduced by the implementation of a novel university bus service operated by hybrid vehicles under the concept of "opportunity charging" and solar powered buses. Aspects such as the relationship between the passengers' need to move around the campus and parameters, such as time schedules, waiting time and alternative means of transportation are addressed. The passenger demand series generated by the models are linked to bus dwell times, which in turn determine the available charging time at each bus stop.