

Simulating Elevated Rapid Transit System for Performance Analysis

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Abstract : One of the major challenges of transportation in medium sized inner-cities (such as Tel-Aviv) is the last-mile solution. Personal rapid transit (PRT) seems like an applicable candidate for this, as it combines the benefits of personal (car) travel with the operational benefits of transit. However, the investment required for large area PRT grid is significant and there is a need to economically justify such investment by correctly evaluating the grid capacity. PRT main elements are small automated vehicles (sometimes referred to as podcars) operating on a network of specially built guideways. The research is looking at a specific concept of elevated PRT system. Literature review has revealed the drawbacks PRT modelling and simulation approaches, mainly due to the lack of consideration of technical and operational features of the system (such as headways, acceleration, safety issues); the detailed design of infrastructure (guideways, stations, and docks); the stochastic and sessional characteristics of demand; and safety regulations - all of them have a strong effect on the system performance. A highly detailed model of the system, developed in this research, is applying a discrete event simulation combined with an agent-based approach, to represent the system elements and the podcars movement logic. Applying a case study approach, the simulation model is used to study the capacity of the system, the expected throughput of the system, the utilization, and the level of service (journey time, waiting time, etc.).

Keywords : capacity, productivity measurement, PRT, simulation, transportation

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