PERSONAL RAPID TRANSIT OPTIMIZATION AND SIMULATION

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Car dependency of urban transport is the main challenge for most cities: automobiles produce greenhouse gases; cause a significant number of deaths and injuries; limit accessibility to transport and occupy a disproportioned share of urban space, thus preventing the use of more sustainable modes. Yet the car's convenience remains unquestioned.
A promising emerging public transport technology, called Personal Rapid Transit (PRT), has the potential to attract car drivers where conventional mass transit fails: PRT is a fully automate guided public transportation which became commercially available only recently. With PRT up to 6 persons or light freight travel in small, individually controlled and electrically driven vehicles on a network of light guideways. The narrow guideways is grade-separated; guideways can either be elevated, in underground shafts or on-ground if separated by fences. Due to their small cross section (roughly 1m2) and tight minimum turning radius (ca. 5m), guideways can be routed through streets and buildings at minimum visual impact.

From the service point of view, PRT has three distinctive features: (1) passengers can travel from any station of the network to any other station,without intermediate stops or transfers; (2) Passengers do not need to share the vehicle with other passengers; (3) there are no fixed time schedules, vehicles wait at stations or do arrive on demand. This sustainable taxi-alike service is thought to be attractive for many who would currently hesitate to use public transport.

Research objectives are (1) the development of software tools to design and simulate PRT networks; (2) optimal empty and occupied vehicle assignment, (3) network topology optimization (4) stations capacity models (5) development of safe short headway PRT control systems.

While offering customized solutions for PRT planning and simulations, we have been cooperating with private consulting firms on the following

PRT projects: Masdar, Abu Dhabi, UEA; Heathrow, London Airport; Rimini Congress hall, Italy; Vienna, Suedbahnhof, Austria; Izmit, Turkey.

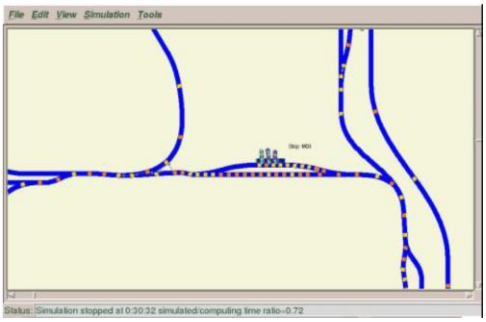

Fig. 1. Snapshot of a network simulation. Shown is an off-line station with waiting passengers.

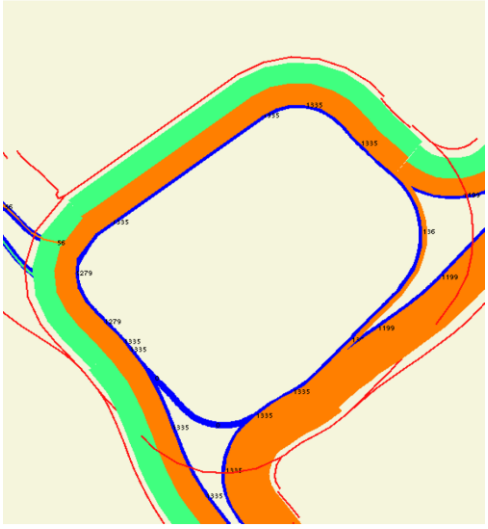

Fig. 2. Optimum occupied vehicle flows (orange) and empty vehicle flows (green) at a roundabout of a PRT network.

Fig. 3. Scale model of 2 PRT vehicles with short headway control system.

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RESEARCH PROJECTS

PRT study at Rimini, supported by the province of Rimini and Europa Inform.

PRT study at Masdar, Abu Dhabi, supported by-Systematica S.p.A and Mott McDonalds, UK.

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