

POOLBUS

An innovative DRT experiment

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Abstract Traditional Public Transport (PT) services are often not sufficiently flexible to satisfy people's mobility requirements, especially in rural areas. These areas are typically characterized by weak transport demand and it is not economically convenient for public transport agencies to provide scheduled or frequent services. Consequently, in these areas people are not encouraged to use PT, but they either prefer or are forced to travel by private car. In a transport planning context where i) mobility is considered a right and ii) the main objective is to discourage private car use, one possible approach consists in a trade-off between the needs of the population and those of the companies supply the service. This balance could be achieved through an innovative on-demand service, which involves Demand Responsive Transport (DRT) that provides flexible and shareable travel options. Nowadays, there are many tools that support the planning and provision of multimodal journeys, but these focus mostly on integration between similar means of transport. Although, as far as the authors are aware, in rare cases carpooling and minibus rental with driver are included, search and reservation is still managed via call centers which is too expensive for areas with weak demand. Technology can help here, especially to meet the needs of travelers to plan real-time multimodal trips that are contextualized to their preferences and permit automatic booking. The availability and usability of a new travel planning system, that supports the user for planning trips via smartphone, is important for persuading people to choose environmentally-friendly travel modes. The objective of this paper is to study and implement an innovative DRT system able to satisfy the mobility needs of people living in weak demand areas and to test it in a well-identified area in Sardinia (Italy). The contribution of this work focuses on three different aspects: 1) flexibility of the service, 2) promotion of multimodal and shared mobility, 3) hierarchization of the transport modes suggested in order of environmental sustainability.

The system consists of a server interfaced with users' smartphones (via a new mobile app) and the platforms of public and private transport companies. Through the mobile app, the user indicates the origin, destination and time of the trip and the app shows all the available travel alternatives. This request is managed automatically by the system, which optimizes the routes of the on-demand services, in order to both reduce the number of vehicles needed and ensure a good level of service quality. The following transport services are considered: traditional PT, minibus rental with driver, carpooling and taxi. A tool supports the service providers in managing the requests and organizing their fleet. New technologies are used to reduce the ratio between the number of passengers and the number of vehicles, and consequently road traffic.

The main expected result is an improvement in the shared mobility supply with the proposed DRT service, which aims to bring people closer to public transport stops. Enhancing accessibility reduces environmental impact and improves the relationship between public transport and population.

Keywords—accessibility, Demand Responsive Transport, multimodal trip planner, transport integration, Internet Communication Technologies