Chapter 4
Setting the Stage for the Integration of Demand Responsive Transport and Location-Based Services

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ABSTRACT

Demand responsive transport systems such as paratransit could deliver services that collective transport simply cannot provide. Location-based services may be capable of bridging the divide between transport services without fixed routes, stops or schedules and their potential users. This chapter outlines how the integration of demand responsive transport and location-based services may help to deliver a flexible transport system that is sensitive to the needs of individual users in urban and rural areas. Such a system would have the potential to liberate urbanism from the need to orient spatial development on rigid transit lines.

INTRODUCTION

Policy makers in Europe have tried for decades to curb the growing use of private vehicles for reasons such as congestion and climate change (Commission of the European Communities, 2001). To that end, national and regional authorities have invested heavily in public transport infrastructure and services. Nonetheless, the share of private vehicles in the modal-split (the percentage share of each mode of transport in total inland transport) is still rising in most European countries (Eurostat, 2008). The efforts to promote public transit have not seemed to successfully provide an alternative means of transportation at a mass scale.

A number of experts blame this fact on the essence of the 'collective transport' concept. With its fixed time schedule, predefined routing and a limited number of possible pick-up and drop-off points, collective transport is fairly insensitive to the actual behaviour patterns of the public. Collective transportation seems to flourish only in dense urban areas, where a collective travel demand can be catered to without the need to facilitate the travel needs of individuals. As such, it seems questionable whether collective transport can provide an adequate

DOI: 10.4018/978-1-61520-769-5.ch004

service level for those that live outside 'classic' metropolitan areas like London, Paris, Madrid, Berlin or Moscow.

A much talked about strategy tries to increase the urban density for the sake of supporting public transport: Transit-Oriented Development, or TOD (Calthorpe, 1993). TOD has had local success stories, such as Portland; Virginia (the Rosslyn-Ballston corridor); Dallas (Mockingbird Station and Addison Circle); Atlanta (Lindbergh Center and BellSouth); San Jose (Ohlone-Chynoweth); and San Diego (Barrio Logan) (Dittmar & Ohland, 2003). However, the TOD approach defies common sense. Transport should facilitate the needs of people. People should not be used to support public transport.

Demand responsive transport (DRT) is often cited as the answer to such issues (Cervero, 1997). DRT is defined as an advanced, user-oriented form of public transport characterised by flexible routing and the scheduling of small or medium-sized vehicles (Mastrogiannidou & Kozanidis & Ziliaskopoulos, 2006). In theory, these demand responsive systems (paratransit) seem very promising, but the first successful implementation of a DRT-system that captures a substantial market share (say: 10 or 20%) has yet to take place.

The Delft University of Technology (TU Delft), Department of Urbanism, participated recently in two large European funded projects: Connected Cities and Spatial Metro. Connected Cities advocated a link between sustainable mobility and urban or regional development (Hoeven, 2008). Spatial Metro allowed the use of techniques such as positioning, tracking and location-based services (LBS) to observe visitors in city centres (Hoeven & Smit & Spek, 2008). In light of these projects, location-based services seem to be a promising method of tackling many of the obstacles faced by the developers and providers of paratransit schemes. We have also observed that the relevant research fields do not intersect in shared projects or joint research groups. Logistics optimisation and location-based services still have to realise the opportunities for collaboration on public transit issues.

This chapter sketches the societal relevance of such mutual collaboration, including the particular areas in which paratransit still seems to struggle and some LBS applications that can address these shortcomings. In the end, it outlines a simple framework that illustrates a possible outcome of such a process. We acknowledge that this picture is speculative and hypothetical by nature. We are nevertheless convinced that it should set the stage for a successful integration of demand responsive transport and location-based services.

BACKGROUND

In 2004, TU Delft developed an initial proposal for a so-called INTERREG IIIC network called Connected Cities. This activity focused on the idea that urban and regional development should reflect public (rail) transport connections. The assumption was that a planning practice that locates housing, employment and services in close proximity to the stops, stations and hubs in the public transport networks would provide the best incentive for people to use public transport (Hoeven, 2005). Such concepts (Transport Development Areas, Transit-Oriented Development) had also been recently developed in the UK (Royal Institution of Chartered Surveyors, 2002) and the US (Belzer & Autler, 2002) in response to issues like congestion, air quality, land use and climate change.

In our talks with potential partners from Greece, we noticed that they were concerned with issues much different than those most commonly discussed in northwest Europe. Air quality, congestion and traffic safety are not big issues outside of Athens, while the lack of transportation in remote rural areas is. Poor accessibility results in social isolation and economic exclusion of large groups of the rural population. In response to this issue, the INTERREG network grew to encompass an additional focus on the social dimension of sus-