penelope bacchus

Promoting Energy efficiency to Local Organisations through dissemination Partnerships in Europe

Best Actions for Collaboration in Countries for a High efficient Use of energy in Structural funds

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Demand Responsive Transit service (DRTs): PersonalBus - Tuscany - Florence - Italy

The DRTs is an advanced, user-oriented form of public transport characterised by flexible routing and scheduling of small/medium vehicles (PERSONALBUS™) operating in shared-ride mode between pick-up and drop-off locations according to passengers needs.

Target Groups	Sector	Field
- Local authority - Regional authorities - Domestic consumers	- Transport	- RES - Equipment / appliances - Monitoring & Management

ANALYSIS

OBJECTIVES

DRTs is part of a mobility management strategy suitable in situations such as low-density population areas or low travel demand periods. It is a more efficient and user-oriented public transport system to cope with the changing mobility needs.

DRTs can also help to achieve social objectives, such as increasing travel choices and creating a more balanced transportation system, thus facilitating strategies in developing co-ordinated Mobility Management activities.

DESCRIPTION OF THE PROJECT

The key component of DRTs is a computer-aided system assisting the control centre staff in the whole process of meeting user's requests, providing dynamic routing and scheduling of vehicles, together with the reporting and accounting operations.

This system is enhanced by the use of:
1) an automated vehicle location device,
2) an on-board small PC to exchange data between the vehicle and the control centre,
3) an automated payment system based on Smart-Cards,
4) an automated geo-coding system to locate all vehicles on a billboard.
The on-board small PC can also be connected to other on-board sensors to collect and process vehicle maintenance data, as well as other various devices.

The software, based on industrial standards, supports the service planning phase through an optimisation process that takes into account the operational constraints, such as:

1) resources (available vehicles, vehicle type and capacity)
2) network characteristics (bus stops location, bus parking area locations, physical and functional features of road network)
3) service standards such as: the Direct Ride Time (the passenger ride time from origin to destination with no stop in between and via the shortest route), the Maximum Ride Time (the maximum allowed passenger ride time), the Widest Shift at Pickup Time, (the maximum delay at pickup time allowed during planning) and the Widest Shift at Delivery Time (the maximum early arrival at destination stop allowed during planning).

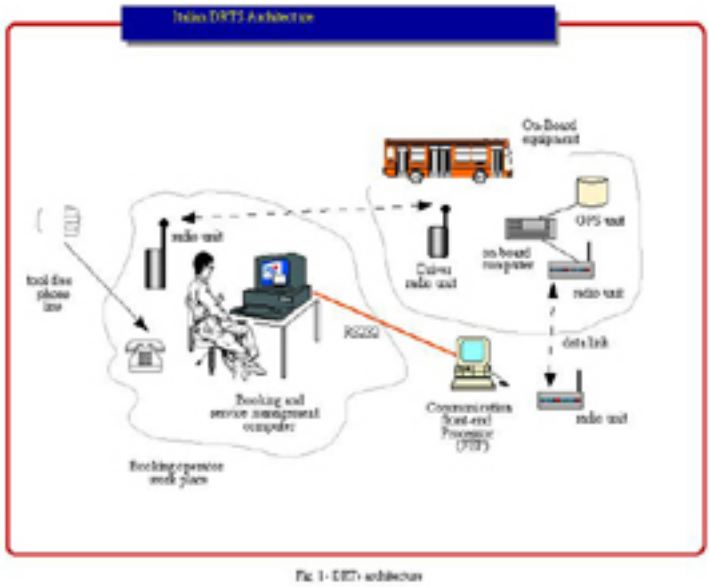

FIG. 1: DEMAND RESPONSIVE TRANSIT SERVICE ARCHITECTURE

COST AND BENEFITS

A preliminary quantification of the impacts on emissions, energy and on the financial costs and benefits, as a result of the implementation of the services, has been carried out.

Compared to the previous transit service structured on three fixed route lines serving only a small part of the built-up area, the DRTs offers the advantage of expanding the transit service throughout the built up area of Campi and, consequently, increasing the amount of potential users; furthermore this has a positive effect also on the overall perception of the transit effectiveness, thus improving the relation between the Company and its customers.
In fig. 2 the positive trend in the encrease of transported passengers is shown.

Compared to the pre-existing traditional transit service, recent estimates demonstrate that the DRTs is more cost-effective for ATAF. The results of a benefit-cost analysis taking into account the costs for the realisation of the new services (such as: acquisition of new hardware instruments and of the related software licenses, training of personnel, etc.), the yearly operating and maintenance expenses incurred before and after (1999) situations and the changes in revenues resulting from the increase in the amount of transported passengers show that the introduction of PERSONALBUS™ has brought to ATAF an yearly saving of about 51.600 Eur.

The total energy savings resulting from the DRT services is approximately 5,84 million megajoules per year; this has been estimated through a model for calculating the amount of energy consumption and the emission in a particular time period, applied to the scenarios before and after the implementation of the service.

The annual emission reduction has been estimated as follows (unit in tonnes): CO=30,2 NOx=1,92 VOC=3,68 TPM=0,24 CO2=625,3

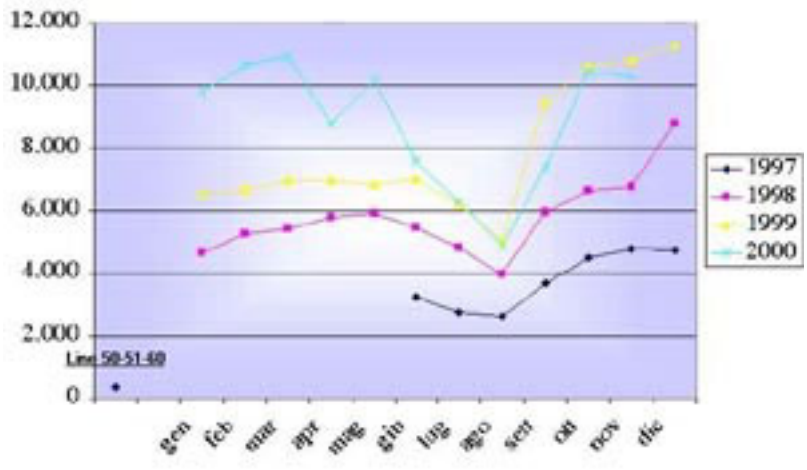

FIG. 2 - INCREASE OF PASSENGERS TRANSPORTED BY PERSONALBUS

PARTNERSHIP

ATAF is a Public Transport Company owned by 8 Municipalities of the metropolitan area of Florence: these are the main stakeholders of this service.
PERSONALBUS™ application software was developed by Softeco Sismat S.p.A. and validated under the EU 4th RTD Framework Programme

RECOMMENDATIONS

OBSTACLES

The major obstacles to this kind of services, as pointed out during the project, can be summarised as follows:

- the promoting actors and service managers of DRTs are usually local communities with very low experience on the transport sector,as well as on the new technologies that can be applied to it,
- the potential transport companies have usually small fleets (20-40 vehicles) not enough to cover all the users' needs,
- local communities and service managers do not have an easy access to the requested know-how and to the most appropriate funding sources.

RECOMMENDATIONS

There is a need to improve the co-operation between all the actors involved, so to overcome the obstacles listed above.
The local Administrations have a leading role in this process as they should also harmonise local DRTs in the much wider strategy of the transport system throught the whole regional area.

TO KNOW MORE

Name organisation : ATAF S.p.A.
Phone number : + 39.055.5650.488
E-mail : binazzi@ataf.fi.it
Website : http://www.ataf.net

Name organisation : ENEA
Phone number : + 39.06.3048.111
E-mail : romanazzo@casaccia.enea.it
Website : http://www.enea.it

USEFUL INFORMATION

List of Publications

SERVIZI DI TRASPORTI A CHIAMATA; INTERAZIONE TRA SISTEMI, GESTORI ED AUTORITA' /	**G. Ambrosino, P. Sassoli, C. Binazzi /**	**- /**	**Italian /**	**2000**
I SERVIZI FLESSIBILI DI TRASPORTO PER UNA MOBILITà SOSTENIBILE /	**G. AAmbrosino, M. Romanazzo /**	**ENEA /**	**Italian /**	**2002**
EBUSINESS INFRSTRUCTURES FOR FLEXIBLE MOBILITY SERVICES: THE EUROPEAN FAMS PROJECT /	**G. Ambrosino et al /**	**ITSC2002 IEEE Conference of Singapore /**	**English /**	**2002**
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THIS CASE HAS BEEN REALISED BY

Organisation :	ENEA	E-mail :	peronaci@casaccia.enea.it casali@casaccia.enea.it	Internet :	http://www.enea.it	Published :	3/9/2002

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