

CiViTAS
Cleaner and better transport in cities

ARCHIMEDES

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Monza

R19.1 – Study of DRT in Monza

City of Monza

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1. Introduction

1.1 Background CIVITAS

CIVITAS - cleaner and better transport in cities - stands for Clty-VITAlity-Sustainability. With the CIVITAS Initiative, the EC aims to generate a decisive breakthrough by supporting and evaluating the implementation of ambitious integrated sustainable urban transport strategies that should make a real difference for the welfare of European citizens.

CIVITAS I started in early 2002 (within the 5th Framework Research Programme);
CIVITAS II started in early 2005 (within the 6th Framework Research Programme) and
CIVITAS PLUS started in late 2008 (within the 7th Framework Research Programme).

The objective of CIVITAS-Plus is to test and increase the understanding of the frameworks, processes and packaging required to successfully introduce bold, integrated and innovative strategies for clean and sustainable urban transport that address concerns related to energy-efficiency, transport policy and road safety, alternative fuels and the environment.

Within CIVITAS I (2002-2006) there were 19 cities clustered in 4 demonstration projects, within CIVITAS II (2005-2009) 17 cities in 4 demonstration projects, whilst within CIVITAS PLUS (2008-2012) 25 cities in 5 demonstration projects are taking part. These demonstration cities all over Europe are funded by the European Commission.

Objectives:

- to promote and implement sustainable, clean and (energy) efficient urban transport measures
- to implement integrated packages of technology and policy measures in the field of energy and transport in 8 categories of measures
- to build up critical mass and markets for innovation

Horizontal projects support the CIVITAS demonstration projects & cities by :

- Cross-site evaluation and Europe wide dissemination in co-operation with the demonstration projects
- The organisation of the annual meeting of CIVITAS Forum members
- Providing the Secretariat for the Political Advisory Committee (PAC)
- Development of policy recommendations for a long-term multiplier effect of CIVITAS

Key elements of CIVITAS

- CIVITAS is co-ordinated by cities: it is a programme “of cities for cities”
- Cities are in the heart of local public private partnerships
- Political commitment is a basic requirement
- Cities are living ‘Laboratories’ for learning and evaluating

1.2 Background ARCHIMEDES

ARCHIMEDES is an integrating project, bringing together 6 European cities to address problems and opportunities for creating environmentally sustainable, safe and energy efficient transport systems in medium sized urban areas.

The objective of ARCHIMEDES is to introduce innovative, integrated and ambitious strategies for clean, energy-efficient, sustainable urban transport to achieve significant impacts in the policy fields of energy, transport, and environmental sustainability. An ambitious blend of policy tools and measures will increase energy-efficiency in transport, provide safer and more convenient travel for all, using a higher share of clean engine technology and fuels, resulting in an enhanced urban environment (including reduced noise and air pollution). Visible and measurable impacts will result from significantly sized measures in specific innovation areas. Demonstrations of innovative transport technologies, policy measures and partnership working, combined with targeted research, will verify the best frameworks, processes and packaging required to successfully transfer the strategies to other cities.

1.3 Participant Cities

The ARCHIMEDES project focuses on activities in specific innovation areas of each city, known as the ARCHIMEDES corridor or zone (depending on shape and geography). These innovation areas extend to the peri-urban fringe and the administrative boundaries of regional authorities and neighbouring administrations.

The two Learning cities, to which experience and best-practice will be transferred, are Monza (Italy) and Ústí nad Labem (Czech Republic). The strategy for the project is to ensure that the tools and measures developed have the widest application throughout Europe, tested via the Learning Cities' activities and interaction with the Lead City partners.

1.3.1 Leading City Innovation Areas

The four Leading cities in the ARCHIMEDES project are:

- Aalborg (Denmark);
- Brighton & Hove (UK);
- Donostia-San Sebastián (Spain); and
- Iasi (Romania).

Together the Lead Cities in ARCHIMEDES cover different geographic parts of Europe. They have the full support of the relevant political representatives for the project, and are well able to implement the innovative range of demonstration activities.

The Lead Cities are joined in their local projects by a small number of key partners that show a high level of commitment to the project objectives of energy-efficient urban transportation. In all cases the public transport company features as a partner in the proposed project.

2. Monza

Monza is a city on the river Lambro, a tributary of the Po, in the Lombardy region of Italy, some 15km north-northeast of Milan. It is the third-largest city of Lombardy and the most important economic, industrial and administrative centre of the Brianza area, supporting textile industry and publishing trade. It is best known for its Grand Prix.

The City of Monza, with approximately 121,000 inhabitants, is located 15 km north of Milan, which is the centre of the Lombardia area. This area is one of the engines of the Italian economy; the number of companies is 58,500, i.e. a company for every 13 inhabitants.

Monza is affected by a huge amount of traffic that crosses the city to reach Milan and the highways nodes located between Monza and Milan. It is also an important node in the Railways network, crossed by routes connecting Milan with Como and Switzerland, Lecco and Sondrio, Bergamo and Brianza. "Regione Lombardia", which in the new devolution framework started in 1998, has full responsibility for establishing the Local Public Transportation System (trains, coaches and buses) and has created a new approach for urban rail routes using an approach similar to the German S-Line or Paris RER.

Monza has recently become the head of the new "Monza and Brianza" province, with approximately 750,000 inhabitants, so will gain the full range of administration functions by 2009. Plan-making responsibilities and an influence over peri-urban areas will require the city to develop new competencies.

In this context, the objective of the City of Monza in participating in CIVITAS as a Learning City is to set up an Urban Mobility System where the impact of private traffic can be reduced, creating a new mobility offer, where alternative modes become increasingly significant, leading to improvements to the urban environment and a reduction in energy consumption (and concurrent pollution).

3. Background to the Deliverable

The Public Transport (PT) service in Monza is structured with different timetables according to different hours of the day (peak/off-peak hours) and to different types of days (working/school days, Saturday, Sundays, Holidays etc). There is also a night time service, operational since November 2007, which has high management costs and is scarcely used by citizens. This service is a development on the previous situation, when the night service was guaranteed using the same lines as the daytime service but with very low frequencies.

Measure no. 19 within the ARCHIMEDES project expects that Monza, with the cooperation of ATM/NET, the PT operator in the urban area of the city, assesses the feasibility on demand responsive bus service, in order to carry on the practical experimental phase of a demand responsive transport (DRT) service during the demonstration stage.

The introduction of a demand responsive connection service implies the creation of a more efficient service to citizens, with the aim of ensuring adequate responsiveness to mobility demand of citizens as well as to encourage modal shift. In addition, this kind of service makes Urban Public Transport more energy-efficient in periods of low demand.

PT in Monza has been managed by the Company "Trasporti Pubblici Monzesi – TPM" (100% owned by Comune of Monza) until September 2009, after the City Council decided to merge the branch of TPM concerning Public Transport with the Company "Nord-Est Trasporti –NET", a PT company already operating in Monza, almost totally owned by the Company "Azienda Trasporti Milanesi – ATM" Milan, the largest public PT Operator of the area of Milan.

After the merger, the Municipality of Monza decided that the research stage of Measure no. 19 would have been developed by Municipality technicians, whilst NET would have developed the

demonstration stage of the Demand Responsive Service, exploiting the experience of ATM Milan.

The measure covers 2 tasks.

RTD Task: Public Transport Demand Responsive Connecting Service Design:

The Comune of Monza will undertake a study to plan the Demand Responsive service in order to evaluate if it can be successfully activated in Monza. In order to offer a public transport service in off-peak periods, and to make the service more efficient in periods of low demand, it is necessary to replace the nocturnal service, which is scarcely used and very expensive. The study will investigate timing, lines, cost-benefits analysis, investments, return on investment (ROI), and consultation with citizens about the service.

DEMO Task: Demand Responsive Public Transport Connections:

The Comune of Monza, with the cooperation of ATM/NET (which has already implemented DRT service in Milan) will start a demand responsive service within the city that, using smaller vehicles, will be operated during off-peak periods (especially late evening) to make public transport services more energy-efficient in periods of low demand and more responsive to citizens' needs. After this first demonstration stage, it will be possible to evaluate if such a scheme can be extended to from especially poorly served areas in order to connect these areas to main PT lines.

3.1 Summary Description of the Task

The objective of this study is to gain best practice examples from other cities or other public transport companies who have implemented Demand Responsive Transport Service and to develop a technical specification for the start-up of a DRT service that will be subsequently demonstrated and evaluated.

Even though demand responsive services have already been introduced in many European and Italian cities, in Monza this kind of service has never been investigated, since people are use to a more traditional public transport service.

The study will investigate the possibility to start up a service whose implementation will target users of public transport who use buses in off-peak hours, but also people who never use public transport in off peak hours or during holidays because of the poor service, but who could decide to leave their private cars at home in return for a more efficient service.

4. Demand Responsive Transport Service

4.1 Description of the Work Done

After a survey of the development of the DRT Service in Europe and in some Italian cities which have already implemented the service, the present study investigates Monza's situation in order to define the most suitable running model for the needs of the city. Particular attention has been given to the public transport service in off-peak periods and, more specifically, to the opportunity of replacing the night service, which is scarcely used, against very high management costs.

4.2 Summary of the Activities Undertaken

4.2.1 The Demand Responsive Transport Service (DRTS)

The DRTS is an advanced, user-oriented form of public transport characterised by flexible routing and scheduling of small/medium vehicles operating in a shared-ride mode between pick-up and drop-off locations according to passengers needs, usually using traditional PT service bus stops. This service is meant to fill the gap between individual transport and scheduled conventional transport and it can be developed starting from two different points of view - the scheduled conventional public transport and the taxi.

Conventional scheduled public transport is facing different but important challenges. On the one hand there is a clear need to rationalise the organisation. Historically a high number of different lines are operating, serving most origins and destinations in order to fulfil people's mobility needs, but costs of organisation are less and less covered by fare incomes and the origins and destinations have increased enormously. The answer to this situation has traditionally been to limit the frequency of the services which resulted again in a lower number of customers.

But on the other hand customers have an increasing need for mobility. Here public transport has to fulfil two important roles: offering basic mobility for everyone and giving a strong alternative for the use of a car to reduce the negative impacts of "car personalisation" of mobility and the consequent congestion and pollution. A taxi service is a direct individualised – collectively organised – answer to the need for transport. Characteristics of this transport mode are individual treatment of the customer, quick response, full origin to destination transport and, generally, a rather high fare. This last aspect seems to be the main reason to look for new types of transport.

A combination of trips by the operator will lower the price for each user. The first level of this evolution – the so called shared taxi – will typically combine two or three trips using a normal or large taxi vehicle.

If more trips are combined using a vehicle with more seats – e.g. a van or a minibus – the service may be named "demand responsive", even if a door-to-door service is not offered. If the authority has to pay for the service (e.g. for social reasons) they will also have an interest in optimising the service in order to achieve a higher level of cost efficiency.

An authority can also have other reasons to support such an alternative concept to conventional taxis, e.g. general energy savings and limiting of congestion through the reduction of individual car use.

In this context Demand Responsive Transport (DRT) Services may be introduced according to concepts designed to reduce the operational costs and to give customers an offer of transport with a higher flexibility to meet their needs. Moreover, it can also be considered as 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. In fact, it can also help to achieve social objectives, such as increasing travel choices and creating a more balanced transportation system, thus facilitating strategies in developing coordinated Mobility Management activities: as a matter of fact, as an innovative transport system, it aims at replacing private cars with collective systems which are capable of keeping the advantages of private cars and totally, or partially, removing the disadvantages.

The scheme below (Figure1) summarises the evolution towards new innovative transport concepts starting from the taxi and the conventional transport concept, taking into account the objectives of operators and authorities and new requirements of customers.

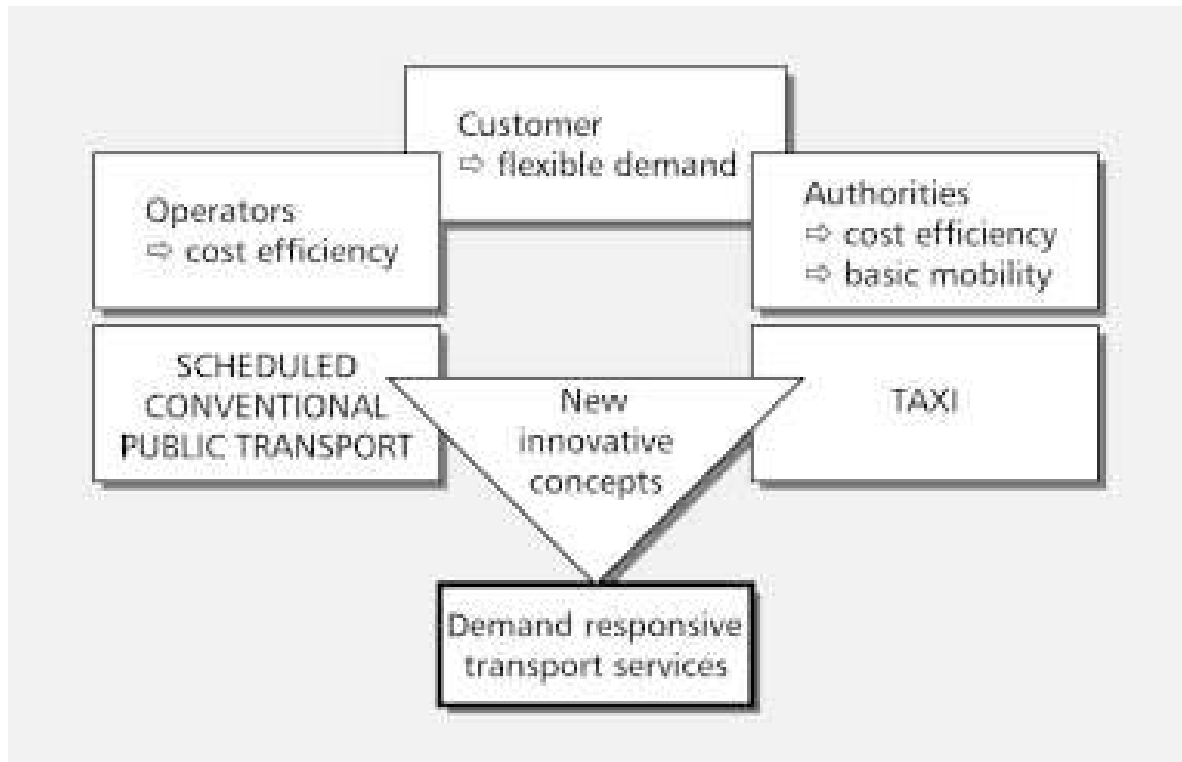


Figure 1: From conventional transport and taxi services to innovative schemes

As suggested by Figure 1, Demand Responsive Transport (DRT) Services are meant to introduce a certain level of flexibility in comparison with traditional public transport or they aim to keep a certain level of flexibility starting from taxi services. However, flexibility can vary a lot and many choices must be made to achieve the right definition and most efficient organisation. In this process the needs and expectations of the customer must come together with the objectives of the operator and authorities. The promising message ‘call us, we drive you’ will give the customer the idea to get immediately a personal vehicle at a low price. In practice, a well organised DRTS will follow specific procedures and organisational rules to meet efficiency objectives. To dovetail both points of view, well motivated choices are required with regards to different aspects of the service which can be seen as the conceptual building blocks of the resulting service scheme.

The most important aspects include the following:

- the route and time concepts
- the booking concepts
- the general intermodal integration
- the vehicle allocation concepts.

4.2.1.1 Route and time concepts

DRTS is usually classified according to a wide range of different concepts are possible, starting from a fully predefined route and timetable to a service for which stops and passing times are fully determined in a period just before operation or even during operation. To get a better view on the possible ways of organising DRT services in relation to route and time choices, a classification is proposed here of DRT service generic route concepts with an increasing level of flexibility having less elements defined in advance.

FIRST LEVEL: service with established routes.

This kind of DRTS is based on a fixed, predefined stop with a predefined passing time and which is always served. It actually differs from the traditional bus service, since users have to make bookings.

SECOND LEVEL: Predefined route and partly fixed timetable.

In this concept the service is partly coincident with a conventional scheduled service. The list of stops to be served, the complete route (arcs in between the service) and the timetable is described in advance. The flexibility of the service consists of the possibility to include some additional stops along a predefined route which are served based on customer demand. The passing times are also predefined. The feasibility of organising such a service is rather limited since the extension will take an extra time after the last fixed stop is served. If the vehicle also has to realise the return service the benefit of doing the last part on request is limited: a waiting time at the last fixed stop would be required if no extensions are needed.

THIRD LEVEL: Deviations on a scheduled service to predefined routes in a corridor.

In this concept the service is basically a scheduled service with fixed stops and predefined passing times, usually connecting defined locations of public interest like interchange nodes (MANY TO FEW mode). In addition, the vehicle will deviate from the route to serve other predefined stops on request with a total flexibility as far as timetables are concerned. These predefined stops are located within a corridor around the basic route; this means that the deviations to serve the stops on request are relatively short (MANY TO MANY mode). In theory, this is a very interesting concept for DRT to organise public transport on main axes where origin and destination points are situated near the main transport axis. The vehicle has only to leave the most direct route if there are requests. Unnecessary roundabout routes are avoided reducing time and kilometres.

The deviation will normally take more time than the direct route. For this reason a balance needs to be achieved between the deviations and the feasible time margins on the fixed timetable for the fixed stop of the basic route. For this reason it can be decided that all customers have to book for the service or that customers are clearly informed of the time margins that are applicable for the fixed stops as a consequence of possible deviations.

FOURTH LEVEL: service with free routes between an undefined set of points.

This last level is based on free routes between undefined points where passengers are picked up and dropped off, similarly to a taxi service (DOOR TO DOOR mode).

4.2.2 System Architecture

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 optimization 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 stops 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).

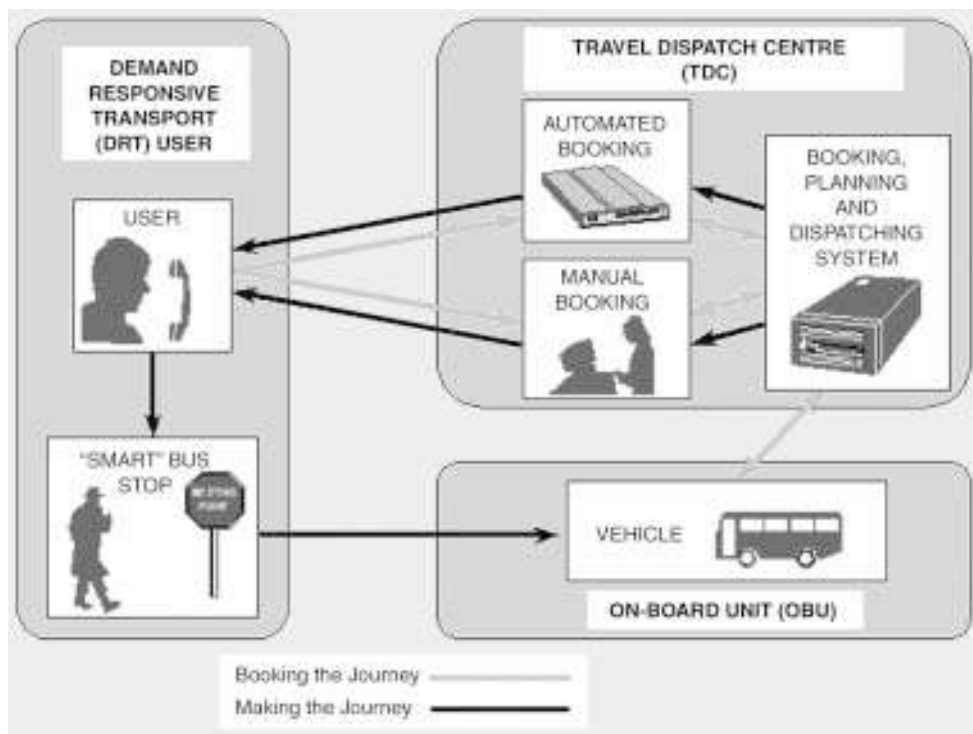


Figure 2: Schematic Representation of Telematics-based DRT Services

4.2.3 DRTS in Europe

In CIVITAS projects several European cities have implemented Demand Responsive services.

In **Toulouse** the traditional PT service has been integrated with a DRT service in order to better serve the low density areas of the Toulouse conurbation. The transport-on-demand services already existed in some of these areas, even though it involved only few communities. The aim of the implementation in Toulouse was to standardise and improve the service, exploiting it to other low density areas.

The activities performed within this measure were the following:

- identification of the potential improvements of the existing transport on demand services and implementation of new transport on demand lines;
- development of an innovative tool for the management of the transport on demand services at the level of the Toulouse conurbation (through the use of a new central booking system). This new system has permitted an easiest access to the service, reducing the reservation delay and optimising the route planning through a dynamic approach in order to reduce the operational costs of the service, while increasing its attractiveness;
- development of complementary tools (ticketing system integration - information systems) to improve the overall efficiency and quality of the transport on demand service;
- proposal of an innovative and integrated mobility service based on the integration of the whole mobility offers (car-pooling, transport-on-demand, public transport) offer proposed on a dedicated area;
- realisation of a satisfaction survey with the transport on demand users. The level of satisfaction of the transport on demand users has proved to be very high (95% of the surveyed people are at least satisfied with the service) and most of the transport-on-demand offer conditions (route, functioning and booking) have been also considered satisfying. Transport on demand traffic has increased considerably during the CIVITAS MOBILIS project (plus 3.5% on several transport-on-demand lines). An economic analysis also highlighted that DRTS was much cheaper than operating regular bus lines.

In **Bristol** a charitable no-profit organisation, Dial-a-Ride (BDAR), has provided a demand responsive transport service for mobility impaired travellers. The service focused on access and provided a door to door service across Bristol for people with disabilities with equal opportunity to access public transport. At the beginning of VIVALDI project, Bristol Dial-a-Ride provided a service for 27 of the 36 City wards using 10 fully accessible vehicles traditionally diesel fuelled. The service had some 9,500 registered members who were able to book door-to-door journeys in advance at the cost of the equivalent bus fare. At the end of the project 10,500 registered members had been counted and LPG buses had been introduced. The Bristol Dial-a-Ride service allows users to pre-book journeys via a telephone operator, with most journeys being requested the day before travel (advance bookings are taken for hearing impaired people or those without a telephone).

In **Funchal** the PT operator is creating a Dial and Ride service which can provide a service to very dense areas in the city centre, with narrow roads, where conventional buses can't pass through, thus creating more accessibility and reducing social exclusion of the population who live there. In the city there has been a public transport service dedicated to disabled people since 2005. People wanting to access the actual service had to formally prove their inability to use the standard service. After registration, users could book two days in advance simply calling the PT Company and defining time and destination of the trip. The service was processed

without an electronic system to manage and optimise trips, organisation and scheduling. Although there was no electronic support to communicate and locate vehicles, this service registered good results during the 3 years of operation.

In **Brno, in the Czech Republic**, five new minibuses for wheelchair-mobile people and for regular services (in the city centre and in the off-peak hours) were introduced. Apart from operating on special lines designated mainly for wheelchair users and in the city centre, the minibuses would also operate during off-peak hours (in the evenings) on low-demand lines where standard bus usage is not effective.

4.2.4 DRTS in Italy

As previously explained, DRTS locates in an intermediate position between taxi service and Public transport as far as flexibility (in terms of routes and timetables) and costs are concerned.

A comparison between the different systems implemented in Italy shows that major differences between these approaches concern timetables (day or night), daily schedule (working/not working day) and localisation of the service (low demand, both urban and periurban, areas).

In the recent times the evolution of the service is represented by the following functions, which allow maximum flexibility in providing the service satisfactorily:

- representation and integrated management of the road structure through GIS/GPS systems in order to locate vehicles and optimise routes;
- optimisation of schedules and timetables through an appropriate software for service management, in order to offer a real time answer to users' needs;
- call centre or web service for users;
- system of data transmission to vehicles, which are usually equipped with a terminal to visualise routes and timetables;
- use of small vehicles.

PROJECT	Type of service	Timetable	Supply	Technical characteristics
Telebus TERNI	Automatic management of relationships between user – operator – bus drivers with an optimisation in terms of answer capacity and use of buses		Service is based on the use of minibuses (25/30 seats), according to the following principles: 1. Passengers book a journey by phone or by web. 2. Computer system elaborates requests and automatically chooses the available bus. 3. Central system automatically calls available vehicles which satisfy users' needs. 4. The system guarantees real time communication to the management and control of all running operations.,. 5. After verifying the availability of the bus, payment is requested to customers, who	Project is based on the optimisation of a service which has already been activated through installation and configuration of specific software.

PROJECT	Type of service	Timetable	Supply	Technical characteristics
			will receive an invoice.	
Personalbus FLORENCE	DRTS used for surrounding small cities with low demand	During working days	Citizens who need to book a journey call a free toll number at least 30 minutes in advance. The operator informs them about the available and most suitable trip to the request. Bookings can also be made for next day or week and will get priority. Phone call is free of charge and no extra charge is applied	System is composed by: <ul style="list-style-type: none"> 1. access interface for customers ((telephone, internet, etc.); 2. call centre with operators dedicated to different areas; 3. central archive with map database and traffic data; 4. software for service optimization; 5. AVL/AVM System; 6. communication system to buses equipped with on-board terminals
Radiobus MILAN	Radiobus is dedicated to users who need a PT service especially during night (young people)	At night, from 20,00 to 2,00.	Bookings are made through ATM Call Centre (in future through website or totems along PT routes)	Similar characteristics of Personal Bus
Prontobus LIVORNO	Prontobus is an integrative system to PT service in poor-served areas and in off-peak hours	From 5,30 to 6,30 and from 20,30 to 00,30 on the normal PT net; In poor served areas timetables are extremely flexible	Bookings are made through a call centre. If the request cannot be added to an already scheduled journey, a new one is created according to the number of requests. Drivers have a daily program and variations are communicated by telephone or through the on-board display	Similar characteristics of Personal Bus
Drinbus GENOA	For poor served and low demand areas	Mon/Sat (not on holidays) from 6.00 to 20.00	Bookings are made through call center 30 minutes before the service. If requests arrive later, service is offered only if possible. To use the service users must pay a normal PT fare with an addition of 1 €, which lasts all day long	Similar characteristics of Personal Bus. Service is automatic and answers to users' requests in real time
My Bus FANO	Completion of classical PT service.	Daily	Bookings are made through call centre. Operators inform users about timetable and nearest stop	For working days bookings have to be made one hour in advance, for holidays within 11,00 A.M. of the day before
Prontobus BOLOGNA	Low demand areas		Bookings are made through call	System is composed by::

PROJECT	Type of service	Timetable	Supply	Technical characteristics
AND FERRARA			centre 30 minutes before the service. There is the opportunity of multiple bookings (more people, more days)	<ol style="list-style-type: none"> 1. Management of PT net on a numeric cartography; 2. Optimization of shifts and working timetables management; 3. Booking system: a Call centre collects bookings and sends to buses the updated boarding list
Chiama BUS L'AQUILA	On holidays, covering the whole city territory along usual PT routes	On holidays from 6,00 to 23,00	<p>Users can call a free toll number or the call centre all week long, indicating leaving stop, destination and requested timetable.</p> <p>Operators plan the most suitable route according to requests and buses' availability.</p> <p>No extra cost is requested</p>	Not available
AutoDrin EMPOLI	Poorly served/low demand areas	Mon/Fri from 7.30 to 19.30 (not working in August)	<p>Service is offered through local taxi service by paying the normal PT fare or using the monthly ticket</p> <p>Users can use the service by choosing the leaving stop and destination on a map.</p>	Bookings are made through a call centre 24 hours before the service

4.3 Main Outcomes

4.3.1 Regulatory framework of Public Transport

According to Italian law, the responsibility for Public Transport buses rests with the Provinces, which issue tenders and manages contracts with PT companies. Municipalities can only issue tenders for the urban service.

The actual contract running PT Service in Monza was issued by Province of Milan in 2007, following an agreement between Comune of Monza and Province of Milan aimed at having a unique contract for PT service for both the urban and suburban area of Monza, which includes many surrounding cities like Vedano, Cinisello, Muggiò, Brugherio: as a matter of fact, historically, the PT service for the city of Monza has always extended to the city surroundings, and there was a strong input to maintain this approach.

In this framework, when the ARCHIMEDES project proposal was first submitted in 2007, the idea was to replace the night service, which is very expensive and underused, with a DRTS. The public transport service was then managed by TPM, a PT company 100% owned by Comune of Monza, but in September 2009 TPM merged with NET, a PT company in which ATM (the company which runs the bus and the metro service in Milan) has a stake, so urban lines are now managed by NET.

Immediately after the merging procedure, NET could not devote resources to the ARCHIMEDES project measures due to pressing administrative accomplishments following the merger.

Moreover, in June 2009, Monza became capital of the new Province of Monza and Brianza: administrative offices of the new public body started to be operational, but for almost two years the inheritance process for the Public Transport contract was not completed, so there was no administrative office to refer to for questions relating to public transport.

This situation did not allow Comune of Monza to operate the amendment to the running contract for public transport in order to implement the service, replacing the night service with the DRTS.

Only on May 1st 2011 did the contract for PT bus service, previously managed by Province of Milan, pass into the administration of Province of Monza, which will manage it until its expiry date, scheduled in 2014. However, at the moment the Province is not willing to test the Demand Responsive Service, since there is the need to acquire full knowledge of contract terms before facing any modification. Without the Province authorization, it is very hard for Comune of Monza to implement a Demand Responsive service without incurring very high costs.

4.3.2 Model proposed for Monza

For the reasons explained in the previous section, it has been decided to implement a reduced DRTS, aimed at serving one particular district of the city of Monza and only in particular situations, like important events (concerts, sport events, summer shopping evenings, events for the Monza Patron Saint Fair and initiatives for the Grand Prix in September).

The chosen district is San Fruttuoso, a particular area of the city which was historically divided from the rest of the urban asset by State Street no. 36, which in Monza is named SP5 and which can be seen in the figure 3.



Figure 3: Map of Monza with San Fruttuoso district

During the past two years, important street works have been in progress in that area to build a tunnel in the urban part of SS36 in order to reduce through traffic which affects San Fruttuoso district.

These street works have resulted in significant inconvenience for the citizens of the district, as it has been necessary to close several streets to traffic in order to demolish an overpass and to create an alternative viability while digging to build the tunnel, which is going to be the longest urban tunnel in Europe (1.6 km).



Figure 4: Air view of San Fruttuoso District with alternative viability

Because of this particular situation, it is very difficult for citizens living in San Fruttuoso district to have easy access to the principal road network if not facing long queues and spending time jammed in traffic.

At first, an attempt to plan a traditional DRTS, with a call centre for bookings and a bus equipped with an on-board unit to receive journey plan was made, but operational costs were too high for Comune of Monza: actually, NET had presented the following estimate:

- Software for DRTS management - € 6.500
- Communication activities and bus stops preparation - € 2.500
- Call centre activity – 50 € a day
- Bookings management - 500 €
- Bus service – 400 € a day.

Such an estimate was too expensive for Comune of Monza to be sustainable with its own funds, so it has been decided to implement a normal shuttle bus service to be booked by telephone or by e-mail. No call centre will be activated, but bookings will be registered by the Mobility and Transportation Office of Comune of Monza.

The bus will run from San Fruttuoso district to the venue of the event for which the service has been activated, along traditional PT routes, and stopping at fixed bus stops where customers have asked to get on the bus in their booking.

Service will be free of charge for the demonstration period in order to attract the largest number of users. In order to have a good cost-benefit approach, the shuttle bus on demand will be activated only with a minimum of five bookings.

For the first period of demonstration (July – September 2011) six - seven events had occurred which attracted many people interested in reaching the venue from San Fruttuoso without using their car. Specifically, the chosen events were five live concerts by prominent artists and fireworks during Monza Patron Saint Fair (held in Villa Reale) and other traditional events held during the Grand Prix week (live concert and a charity football match, held at the Brianteo stadium of Monza).

The two routes run by the shuttle bus on demand are depicted in figure 5 (in red the route from San Fruttuoso to Villa Reale and in blue the route to Brianteo stadium).

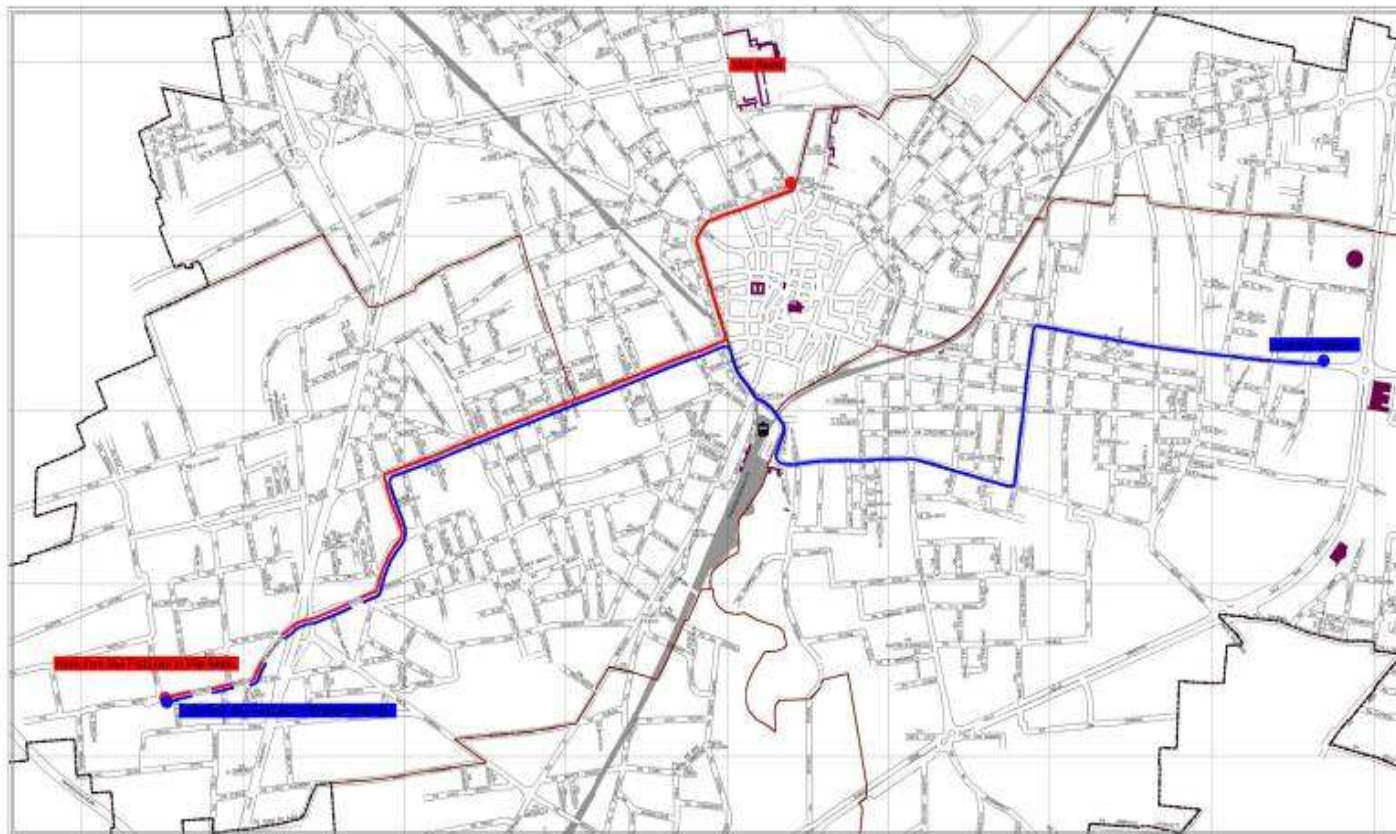


Figure 5: Map of Shuttle bus on demand routes

The bus will start from the traditional terminus in San Fruttuoso at 8.00 p.m. taking customers to the venue or the event and returning them after. Drivers will be supplied with the list of bookings, in order to be able to check if every person is present for both journeys, so not to leave anyone behind, especially on the return journey.

A strong communication activity has been undertaken in order to inform citizens of the service. A press release has been sent to all local newspapers.

A SAN FRUTTUOSO

Navette gratuite per portare i residenti agli eventi della città

SAN FRUTTUOSO non è tagliato fuori dagli eventi in città. E i due chilometri del cantiere di viale Lombardia si superano con il bus a chiamata. Si tratta di un'iniziativa avviata a metà mese dall'assessorato alla Viabilità che mette a disposizione dei cittadini residenti nel quartiere al di là del viale una navetta che effettua corse gratuite verso il centro in occasione delle serate in cui si svolgeranno i principali eventi della Sagra di San Giovanni e i concerti in Villa Reale. L'iniziativa è organizzata nell'ambito del progetto europeo Civitas Archimedes per la mobilità urbana sostenibile. Viene garantito un bus gratuito da prenotare che partirà alle 20 dal capolinea in via Marelli e raggiungerà piazza Citterio seguendo il percorso con possibili fermate in via Risorgimento, viale Romagna, via Meda, via Pitagora, via Cavallotti, via Manzoni, via Appiani e piazza Citterio. Al termine degli eventi il bus ricondurrà gli utenti alle fermate del viaggio di andata in orari tra le 23.30 e le 00.30). I cittadini interessati potranno prenotare il bus con almeno 2 o 3 giorni d'anticipo e segnalando la fermata alla quale intendono salire sull'autobus. Sono disponibili i numeri di telefono (039/2832838-39-40) dalle 8.30 alle 12.30 e dalle 14 alle 16.30 da lunedì a giovedì e dalle 8.30 alle 12.30 al venerdì, oppure l'indirizzo mobilita@comune.monza.it. Il servizio, gratuito, sarà attuato con un numero minimo di 5 prenotazioni.

M.Ag.

Figure 6: Press release on "Il Giorno" (local newspaper)

NET has placed notices on its vehicles and at bus stops served by shuttle buses and put the information on its website.

INFORMAZIONI AL PUBBLICO

**Navetta gratuita a chiamata
nel quartiere di San Fruttuoso**

Per agevolare i cittadini residenti nel quartiere San Fruttuoso, il Comune di Monza ha previsto l'attuazione di un servizio gratuito di bus navetta a chiamata per raggiungere **la Villa Reale**, in occasione degli eventi della Sagra di San Giovanni.

La navetta partirà alle **ore 20 dal quartiere San Fruttuoso**, dal capolinea di via Marelli, e raggiungerà piazza Citterio effettuando il seguente percorso:

- via Risorgimento – viale Romagna – via Meda – via Pitagora – via Cavallotti – via Manzoni – via Appiani – piazza Citterio.

Al termine degli eventi (23,30-00,30) il bus effettuerà il percorso inverso.

Il servizio, gratuito, sarà attuato con un numero minimo di 5 prenotazioni.

Per le prenotazioni contattare il numero 039/2832838-39-40 dalle ore 8,30 alle ore 12,30 e dalle 14,00 alle 16,30 da lunedì a giovedì e dalle 8,30 alle 12,30 al venerdì, oppure inviare una e-mail all'indirizzo mobilita@comune.monza.it, segnalando la fermata alla quale si intende salire sull'autobus.

Per ulteriori dettagli sul calendario degli eventi e sulle modalità di prenotazione vi rimandiamo al sito del Comune di Monza (www.comune.monza.it)

Esente da Bollo

Figure 7: NET notice on vehicles and on bus stops



Figure 8: Information on NET website

A page has been dedicated to the service both on the Municipality website and on ARCHIMEDES website, in order to reach the largest number of citizens, and information has been put on Facebook page of the Municipality, where a memorandum will be placed in the days before the event in order to remind people to book the shuttle bus in good time.

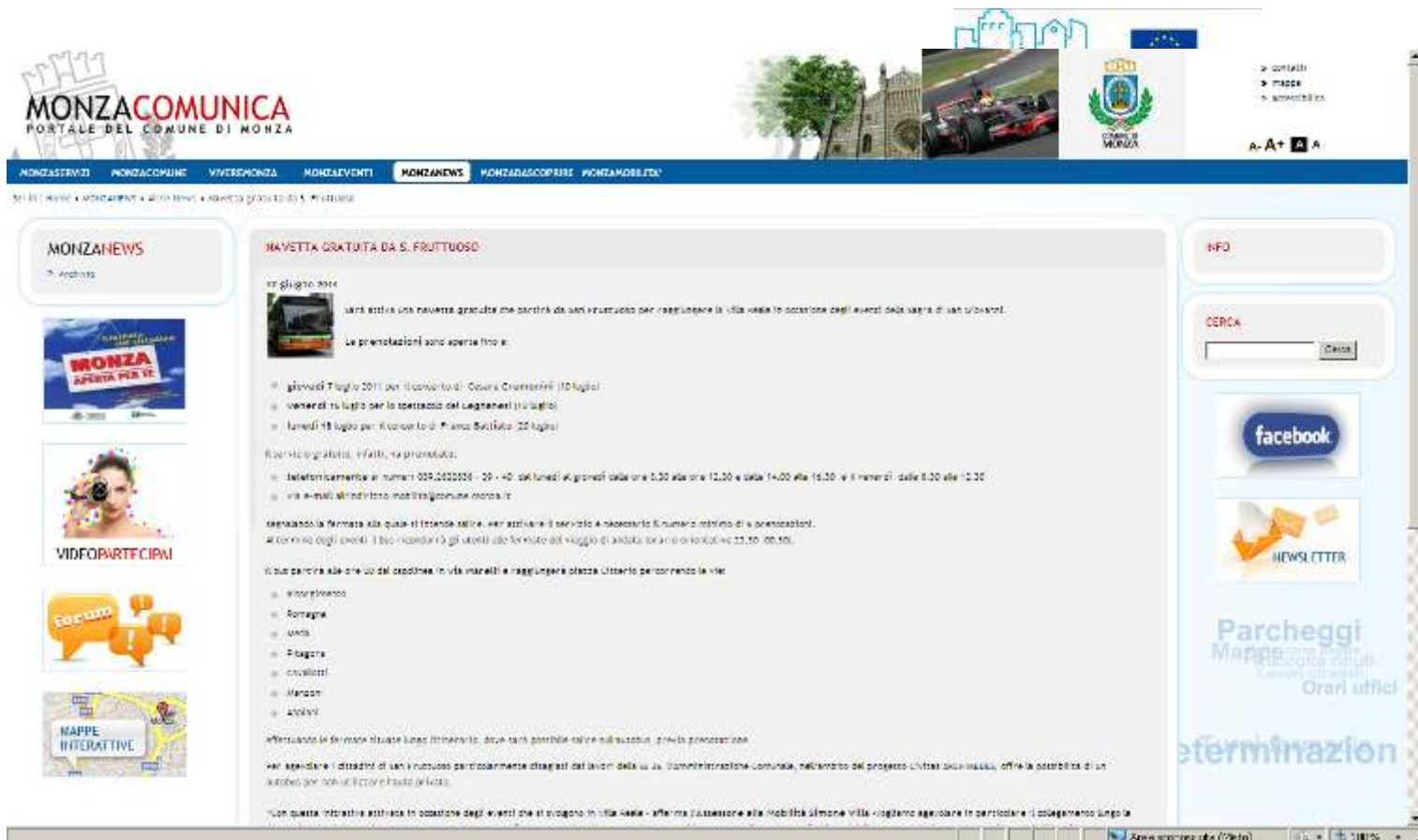


Figure 9: Municipality website



Figure 10: ARCHIMEDES website

4.4 Problems Identified

Apart from problems described in Section 4.3.1, due to the existing administrative framework, which made it impossible to test the traditional DRTS, no particular problems have been identified.

It must be emphasised that this kind of service, even though it cannot be considered a traditional DRTS, is definitely less expensive (Comune of Monza will only pay for the bus service, with an estimated cost of 300 € for each service) and it can be considered a good

starting point to test the interest of citizens for the service in order to decide whether to implement a traditional DRTS in a more favourable period (in terms of lesser economic constraints) or on the occasion of next PT service tender, which will be held by Comune of Monza in 2014 in now that it has become head of the new Province.

4.5 Mitigating Activities

Not applicable at this stage of the measure. Any mitigating activity, if necessary, will be decided during the implementation stage of the measure.

4.6 Future Plans

The demand responsive service will be activated for particular events of interest to citizens. The service will be evaluated in order to understand whether and when it is considered useful, and if it will be possible to activate it for other occasions (such as holidays, poorly served areas, major road works etc) or for other districts of the city.