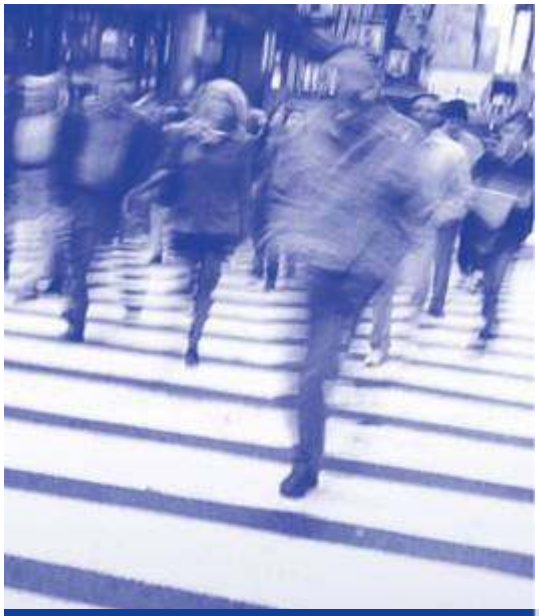

CiViTAS
Cleaner and better transport in cities

ARCHIMEDES
AALBORG • BRIGHTON & HOVE • DONOSTIA - SAN SEBASTIÁN • IAŞI • MONZA • ÚSTÍ NAD LABEM

# D11.6 – Researching Mobility Services and Sustainable Modes

January 2012

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# Contents

# 1. Introduction

## 1.1 Background CIVITAS

CIVITAS - cleaner and better transport in cities - stands for CIty-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 the European citizen.

**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.

# 2 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.

## 2.1 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.

## 2.2 Aalborg

The City of Aalborg, with extensive experience of European cooperation and having previously participated in CIVITAS I (VIVALDI) as a 'follower' city, is coordinating the consortium and ensures high quality management of the project. The City has the regional public transport authority (NT) as a local partner, and framework agreements with various stakeholder organisations.

Aalborg operates in a corridor implementing eight different categories of measures ranging from changing fuels in vehicles to promoting and marketing the use of soft measures. The city of Aalborg has successfully developed similar tools and measures through various initiatives, like the CIVITAS-VIVALDI and MIDAS projects. In ARCHIMEDES, Aalborg aims to build on this work, tackling innovative subjects and combining with what has been learned from other cities in Europe. The result is an increased understanding and experience, in order to then share with other Leading cities and Learning cities.

Aalborg has recently expanded its size by the inclusion of neighbouring municipalities outside the peri-urban fringe. The Municipality of Aalborg has a population of some 194,149, and the urban area a population of some 121,540. The ARCHIMEDES corridor runs from the city centre to the eastern urban areas of the municipality and forms an ideal trial area for demonstrating how to deal with traffic and mobility issues in inner urban areas and outskirts of the municipality. University faculties are situated at 3 sites in the corridor (including the main university site). The area covers about 53 square kilometres, which is approximately 5 % of the total area of the municipality of Aalborg. The innovation corridor includes different aspects of transport in the urban environment, including schools, public transport, commuting, goods distribution and traffic safety. The implementation of measures and tools fit into the framework of the urban transport Plan adopted by the Municipality.

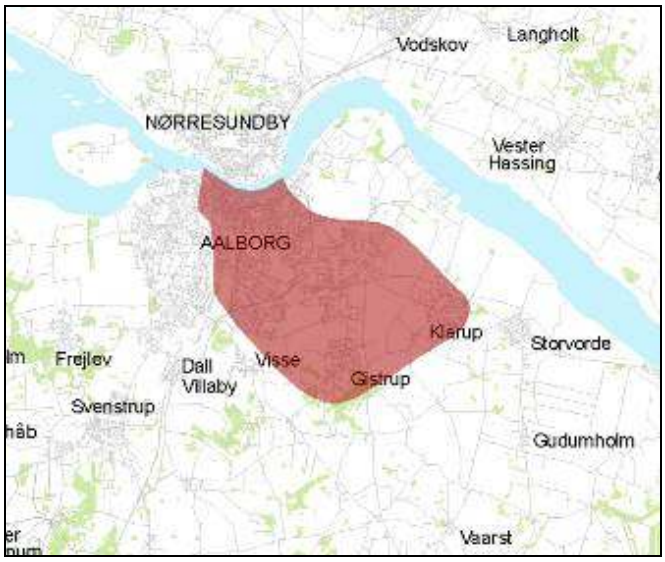



**Figure 1: The Archimedes Corridor in Aalborg**

## 2.3 Brighton & Hove

Brighton & Hove is an historic city, in the south-east of England, known internationally for its abundant Regency and Victorian architecture. It is also a seaside tourist destination, with over 11km of seafront attracting eight million visitors a year.

In addition, it is a leading European Conference destination; home to two leading universities, a major regional shopping centre, and home to some of the area's major employers. All of this, especially when set against the background of continuing economic growth, major developments across the city and a growing population, has led the city council to adopt a vision for the city as a place with a co-ordinated transport system that balances the needs of all users and minimises damage to the environment.

The sustainable transport strategy that will help deliver this vision has been developed within the framework of a Local Transport Plan, following national UK guidelines. The ARCHIMEDES measures also support the vision, which enables the city to propose innovative tools and approaches to increase the energy-efficiency and reduce the environmental impact of urban transport.

## 2.4 Donostia - San Sebastián

The city of Donostia -San Sebastian overlooks the sea and, with a bit more than 180,000 inhabitants, keeps a human scale. Some people consider the balanced combination of small mountains, manor buildings, and sea as the setting for one of the most beautiful cities in the world. We have a tradition in favouring pedestrians, cyclists and public transport.

For about twenty years, the city has been enforcing a strong integrated policy in favour of pedestrians, bicycles and public transport. Considering walking and cycling as modes of transport, has led to the building of a non-motorised transport network for promoting this type of mobility around the city.

Likewise, the city has extended its network of bus lanes. The city holds one of the higher bus-riding rates, with around 150 trips per person per year.

The CIVITAS project is being used as the perfect opportunity to expand Donostia -San Sebastian's Sustainable Urban Transport Strategy. With the package of CIVITAS measures Donostia-San Sebastian will:

- Increase the number of public transport users
- Decrease the number of cars entering in the city centre
- Increase the use of the bicycle as a normal mode of transport
- Maintain the high modal share of walking
- Reduce the number of fatal accidents and accidents with heavy injuries
- Reduce the use of fossil fuels in public transport.

## 2.5 Iasi

The City of Iasi is located in north-eastern Romania and is the second largest Romanian city, after Bucharest, with a population of 366,000 inhabitants. It is also the centre of a metropolitan area, which occupies a surface of 787.87 square kilometres, encompassing a total population of 398,000 inhabitants.

The city seeks to develop possibilities for habitation, recreation and relaxation for all citizens in the region, business opportunities and provide opportunities for more consistent investments.

The city has five universities with approximately 50,000 students, the second largest in Romania. The universities and their campuses are located in the central and semi-central area of the city. In the same area, there are also a large number of kindergartens, schools and high schools with approximately 10,000 pupils. This creates a large number of routes along the main corridor, served by the public transport service number "8" (Complex Tudor Vladimirescu - Copou) with an approximate length of 10 km. The City of Iasi will implement its integrated measures in this area to be known as the "CIVITAS+Corridor".

The city's objectives in CIVITAS - ARCHIMEDES are based on the existing plans related to transport, Local Agenda 21, approved in 2002, and the Sustainable Social-Economic

Development Strategy for City of Iasi. The CIVITAS Plus objectives will be integrated in the Strategy for metropolitan development to be finalized in May 2009.

## 2.6 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 a textile industry and a 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).

## 2.7 Ústí nad Labem

Ústí nad Labem is situated in the north of the Czech Republic, about 20 km from the German border. Thanks to its location in the beautiful valley of the largest Czech river Labe (Elbe) and the surrounding Central Bohemian Massive, it is sometimes called 'the Gateway to Bohemia'. Ústí is an industrial, business and cultural centre of the Ústí region.

Ústí nad Labem is an important industrial centre of north-west Bohemia. The city's population is 93,859, living in an area of 93.95km2. The city is also home to the Jan Evangelista Purkyně University with eight faculties and large student population. The city used to be a base for a large range of heavy industry, causing damage to the natural environment. This is now a major focus for improvement and care.

The Transport Master Plan, to be adopted in its first form in 2007, will be the basic transport document for the development of a new urban plan (2011), which must be developed by the City subject to the provisions of the newly adopted Building Act. This will characterise the development of transport in the city for the next 15 years, and so the opportunity to integrate Sustainable Urban Transport Planning best practices into plan development during the project means an ideal match of timing between city policy frameworks and the ARCHIMEDES project.

The projects main objective is to propose transport organisation in the city, depending on the urban form, transport intensity, development of public transport, and the need for access. The process, running until 2011, will include improving the digital model of city transport that Ústí currently has at its disposal. The plan will have to deal with the fact (and mitigate against unwanted effects that could otherwise arise), that from 2010, the city will be fully connected to the D8 motorway, running from Prague to Dresden.

# 3. Background to the Deliverable

This deliverable summarises the research and preparatory activities conducted in relation to workpackage 6 of the CIVITAS ARCHIMEDES project – Innovative Mobility Services.

## 3.1 Summary Description of the Tasks

Research and preparatory activities in respect of innovative mobility service measures have been conducted in four of the ARCHIMEDES cities, namely Brighton, Donostia - San Sebastian, Monza and Usti nad Labem, as part of tasks 11.6.1, 11.6.2, 11.6.3, 11.6.4 and 11.6.5. These tasks are introduced in the following sections.

The work and findings of these tasks are reported in detail in deliverables R54.1, R57.1, R60.1, R61.1 and R62.1. This deliverable draws together the content of the individual deliverables and presents the common issues and any conclusions that can be drawn at the workpackage level.

**Task 11.6.1 Car Sharing Scheme Improvements in Brighton & Hove**

This research set out to identify the optimum locations for the Car Club demonstration that was to be implemented in the Brighton & Hove CIVITAS corridor. The CIVITAS corridor includes areas of low income, with reduced density away from the city (in contrast to current car club sites in Brighton & Hove which are in central, and generally more affluent, areas of the city). Therefore the research considered the implications of setting up a Car Club in disadvantaged or low income areas. To guide the project this research has reviewed best practice in implementation and operation of Car Clubs based on information from established Car Clubs in Europe, including Aalborg.

**Task 11.6.2 Vertical Transport in Donostia - San Sebastian**

As part of Task 11.6.2: 'Vertical Transport', the city of Donostia – San Sebastian carried out an evaluation of existing public vertical transport systems with a view to using the study when considering the need for, and the location of, future vertical transport interventions in the city and expanding the policy of vertical transport in the city to support cycling and walking inside and towards the city centre.

**Task 11.6.3 Cycle Transport Improvements in Usti nad Labem**

The main objective of this demonstration measure is to create facilities for cyclists and to link two existing cycle routes that have cross-regional importance (The Krušné Mountains route - Prague, Litoměřice, Ústí n. L., Děčín, Dresden cycle path) to provide an important cycle route through the city. Ústi nad Labem have undertaken a study to investigate the feasibility of linking these two important cycle routes with a view to delivering a design and implementation plan for the implementation phase.

**Task 11.6.4 Car Sharing Scheme Improvements in Monza**

Monza introduced a car-sharing scheme in April 2007, agreeing with the Province of Milan the commitment to introduce this new approach to urban mobility. Measure 61 is aimed at

implementing a marketing strategy in order to increase the awareness of this new form of car ownership and the number of car-sharing service subscriptions in the five districts of the city. Monza has conducted a study of barriers to the use of car sharing in order to promote the extension of car sharing in the five districts of Monza.

**Task 11.6.5 Cycle Transport Improvements in Monza**

This task involved a detailed study conducted to provide a number of general and technical recommendations in order to plan strategies and actions in support of improving cycling mobility in Monza. The creation of a complete cycle network, even though it will take some years to be achieved, will require:

- Infrastructural interventions on the cycle network;
- Interventions for the improvement of complementary services, like parking facilities, rentals, repairs and maintenance;
- Communication interventions and “marketing” of bicycle use.

In order to meet the study aims, the study developed several themes including an investigation of a ‘Bike Sharing’ service in the city.

# 4. Summary of Research into Innovative Mobility Services and Sustainable Modes in ARCHIMEDES

## 4.1 Deliverable R54.1

**Car Club Research in Brighton & Hove**

The motivation behind this measure was to reduce private car journeys in Brighton & Hove, by encouraging car sharing through designated Car Clubs. This would have the effect of energy saving/reduced carbon emissions in the city, as one car club car replaces around 24.5 private cars[1]. Aside from this there are economic and accessibility benefits to such a scheme. Car Clubs already operated in Brighton & Hove prior to this measure, and therefore research focussed around implementation in less economically and socially advantaged areas.

**Approach**

Research was conducted into best practice in implementing car clubs with the intention of developing a service in less economically and socially advantaged areas of Brighton & Hove. Initial research focussed on web-based literature reviews of cars clubs in Europe with particular case studies of Germany and Switzerland.

Research into UK car clubs in partnership with other modes of transport was then conducted, followed by examining examples of car clubs in non-affluent or non-central locations in the UK. Finally research was conducted into suitable locations to site a car club in Brighton & Hove, based upon findings from the previous research.

Once all this research has taken place it was the intention to implement a new car club in Brighton & Hove, facilitating a non-affluent/non-central location in the city.

[1] Carplus, www.carplus.org.uk

## Findings

### Best Practice

The initial research highlighted key features of a successful scheme involving good partnerships and the importance of reliability and convenience.

Partnerships with:

- Public transport companies
- Car rental companies
- National Government and local authorities
- Other businesses
- National and international organisation

Reliability and Convenience in:

- Booking
- Location and availability
- Range of vehicles
- Smart cards and on-board computers
- Extra equipment

Other significant factors included:

- Transparency of costs
- Good alternatives to car use
- Publicity and information
- Part of an integrated transport system

Linking car clubs in with other transport systems serves an important convenience and usability role and can be enhanced via incentives such as: joint initiatives, joint ticketing, integrated smart cards, integrated information, and joint marketing.

Research showed that joining a car club; reduces car mileage, reduces overall travel, and encourages public transport usage and walking and cycling. Therefore to some degree car clubs can act as a catalyst for more sustainable travel and contribute to an overall reduction in energy use, although as a secondary, rather than a primary impact.

Research into partnership initiatives in the UK highlighted a series of clear benefits to both the operators and the users (examples listed detail the partnerships between car clubs and bus services):

Whizzgo – Leeds

- Free advertising space on buses
- Offering car club members a free monthly season ticket when they join
- 15% discount on annual season tickets

Bristol City Car Club

- First Bus offer 10% discount on all tickets bought in advance for car club members
- Free 3 month rover card for car club members who completely give up their private car.

Bath Car

- First Bus offer 25% discount on Bath Tens (saver strips) for car club members.

Problems experienced (German case study):

- Public transport discounts were too costly. These were reduced, resulting in some members leaving
- Lack of parking spaces
- High up-front joining fees proved a barrier to membership (to combat this the joining fee, deposit, and membership fees were waived, but the hourly rate was increased.

**Car Clubs in low density/less affluent areas.**

A lack of access to transport leads to a marginalisation from employment, income, social networks (such as family and friends), decision making, and adequate quality of life.

Target groups/potential users:
Lower income households who either

- run one car,
- are struggling financially to run a car,
- have no car.

Access to a car club could offer these users links to essential facilities such as health care, shops, job interviews or social activities.

Characteristics
Car clubs operating in less prosperous areas have focused generally upon:

- lower monthly membership fees,
- slightly higher charges for use (mileage and hours), recognising the difficulties that low income families have in meeting monthly payments.
- a higher number of members per car, enabling better utilisation rates to be achieved. This reflects the fact that by paying a higher rate for usage, with low monthly charges, the incentive is very much on limiting car use to essential journeys only.

**Challenges**

- Car ownership is higher in rural areas than in urban.
- 84% of rural households own at least one car.
- Low-income households in the least densely populated areas spend, on average, over 30% more on motoring per week than those in more densely populated areas as they have greater distances to travel.
- Limited availability of public transport
- Decline in the availability of rural services
- Low income households struggle to meet the costs of car ownership

**Examples of Car Club Initiatives in non- affluent or non-central locations**

<u>Swansea, City-Wheels</u>

- Specifically serves social housing residents
- Set up by Swansea Housing Association in 2001
- 30% of social housing residents are disabled, retired or not working
- Used in conjunction with ‘City Living’ – a scheme to get people to move back into the city
- Not-for-profit scheme, keeps costs down.
- Swansea Housing Association runs the club.

- The club is used by employees of the Housing Association and by residents of the social housing scheme.
- The car bays are situated in the underground car park of the social housing building.

Carplus, Rural Car Club Programme

These programmes were set up to learn if they could succeed and to collate best practice. They therefore provide important reference points for trying to implement similar schemes in rural, and specifically to Brighton & Hove, less affluent areas.

- Multiple projects set up to test the feasibility of car clubs in rural areas.
- Community co-operation is required to make car club vehicles accessible to all when population density is low.
- Community networks already in place should be utilised to support and champion the club
- Partnership with Carplus, Sustrans, and the Countryside Agency

CarPlus Rural Car programme exists in:

- Moorcar (Ashburton)
- Stroud Valley Car Club (Stroud)
- A2B Travel Club (Bradford-on-Avon)
- Clay Wheels (Cornwall)
- Our Car Your Car (W Yorkshire)
- Hour Car (W Yorkshire)
- Endeavour Car Club (N Yorkshire)
- GoCars (N Yorkshire)

It is also clear that significant barriers exist to prevent car clubs and car sharing playing a significant role in the provision of accessibility to some disadvantaged groups. Barriers include:

- Lack of understanding of the car club concept;
- Lack of reliable data on the relative costs of provision by different means;
- A concern not to further erode the market for conventional public transport;
- The difficulties likely to be experienced when attempting to introduce a car club within a deprived community (difficulty posed by annual fee, lack of commitment within the community, vandalism, insurance problems.);
- Concern among some car club organisers as to the possible negative effect on their brand image.

Some groups/communities are not just isolated by economic factors alone but have complex additional needs whereby agencies on behalf of that group become a factor. Therefore additional barriers include:

- Institutional inertia (fed by professional jealousy, lack of time to consider new modes of provision, lack of understanding of the concept of car clubs and a belief that, since the concept would not be appropriate for all clients, it is not worth considering);
- The fact that some specific groups would require delivery/pick-up arrangements;
- The fact that some specific groups would require specially adapted vehicles.

**Future Activities**
It had been intended that the research would inform the expansion of the car club scheme in Brighton & Hove in order to serve more socially disadvantaged and less densely populated locations than is currently the case. The intention was that the recommendations above would inform the identification and selection of suitable locations that fall within the CIVITAS corridor and correspond with the project objectives. Precise locations would have been finalised through consultation with car club operators and relevant stakeholders.

However, it was not possible to pursue the scheme as car club operators did not believe that it would be a financially viable project and there would have been a significant ongoing financial implication to Brighton & Hove City Council beyond the funds available for and the timescale of the project. This was the conclusion drawn from several discussions with car club companies operating locally and nationally within the UK.

## 4.2 Deliverable R57.1

**Study of Vertical Transport in Donostia-San Sebastian**

Vertical transport in Donostia-San Sebastian represents energy saving mobility through improving accessibility for sustainable modes of transport, in the form of facilitating walking and cycling. Prior to this measure there was already vertical transport provision in Donostia-San Sebastian, and therefore the research focuses on reviewing what is already in place and planning future implementation.

**Approach**
The objective was to study and evaluate the Vertical Transport Systems (such as lifts, escalators and ramps) that already exist in the city of San Sebastian and to identify possibilities for the implementation and further development of Vertical Transport Systems that could interconnect areas of the city that are located at different heights. The aim was to locate and describe the problems with the current provision in order to inform and help further develop the improvement plan.

**Findings**
The main public transport systems and pedestrian and cyclist facilities are located in the low and flat areas and therefore this report focuses on the high areas for further development. The study will focus on the 10 most populated neighbourhoods in the city. Some of these neighbourhoods are the ones that have the biggest vertical mobility problems and therefore the ones that offer bigger possibilities for improvement.

The following table shows the characteristics that are considered when evaluating the installation of new vertical transport systems.

| COMPARATIVE TABLE FOR LIFTS, ESCALATORS or RAMPS | | |
|---|---|---|
| **CONCEPT** | **LIFTS** | **ESCALATORS AND MECHANICAL RAMPS** |
| Installation cost | Relatively cheap, depending on the external finish | Relatively expensive |
| Maintenance cost | Relatively cheap | Relatively expensive |
| Energy consumption | Low | Medium |
| Slopes where installed | Very steep slopes, close to verticality. Steep slopes if combined with footbridges, and medium slopes for inclined lifts. | Medium (27 – 35º) for escalators and small (6-12º) for ramps. |
| Height difference overcome | Lift cover drops ranging from 8 – 30 metres, a landing and emergency exit must be provided every 11 metres. | Each flight or escalator can overcome height differences from 6 to 10 metres, |
| Carrying capacity | 480 persons/hour/direction | 4500-11000 person/hour/direction |
| Accessibility | Complete | Limitation for wheelchairs, prams, elderly people, and persons using a walking stick. |
| Attractiveness for user | Acceptable so long as there is at least one glass window providing external visibility | Very high |

For the assessment of the introduction of new public vertical transport systems, each neighbourhood has been assessed under the following criteria:

A. Population served and demographic characteristics.
B. Travels to and from the district concerned (distribution among the different means of transport)
C. Pedestrian and cycle connectivity
D. Public transport alternatives
E. Demographic characteristics
F. Topographic features and their relation to the buildings and activities.

This study has looked into ten neighbourhoods, which were selected due to their centrality, high population, unfavourable orography and the existence of discontinuities on the pedestrian and cycling paths.

This phase's two main aims were to plan new cycling and pedestrian paths located on high and low terrains of the city, and to improve the mobility of citizens between non easily accessible areas of the city with the aim of facilitating a further social development of this areas.

The Vertical Transport Systems already in use in the city have created opportunities for the development of pedestrian and cycling infrastructures that connect areas in different altitudes of land therefore reducing the use of private transport in the city.

Most of the pedestrian and cycling infrastructures in the city centre are already linked and therefore this report focuses on the lifts and ramps that are located in neighbourhoods situated at different land heights. The development and implementation of Vertical Transport Systems, in conjunction with the infrastructure already existing in the city, have encouraged citizens to walk or cycle to connect locations within the city like for example the bus and Renfe train stations.

The main output of the study is the decision to build five new lifts and 5 escalators that will create new opportunities for different neighbourhoods. Once these elements are in place it will become possible to measure how walking, cycling and private transport movements changes because of the use of the Vertical Transport Systems.

The proposed improvements in Vertical Transport Systems in those neighbourhoods will further link the pedestrian and cycling infrastructures in the centre of town with the ones in the rest of the neighbourhoods.

The improvement of the Vertical Transport Systems will additionally improve access to the areas that will create new possibilities for social development allowing people to live in areas that were not easily accessible beforehand.

## 4.3 Deliverable R60.1

**Cycle Transport Improvements in Usti nad Labem**

This measure aims to encourage and increase cycling in Usti nad Labem, therein prompting a modal shift away from private motorised transport usage. There was already a cycle lane network present in the city prior to this measure; therefore the research will focus upon plans to expand/improve the current provision, along with improving available information.

**Approach**
The two main targets of this measure are:

- To improve conditions for cyclists in the city,
- To create suitable facilities for them.

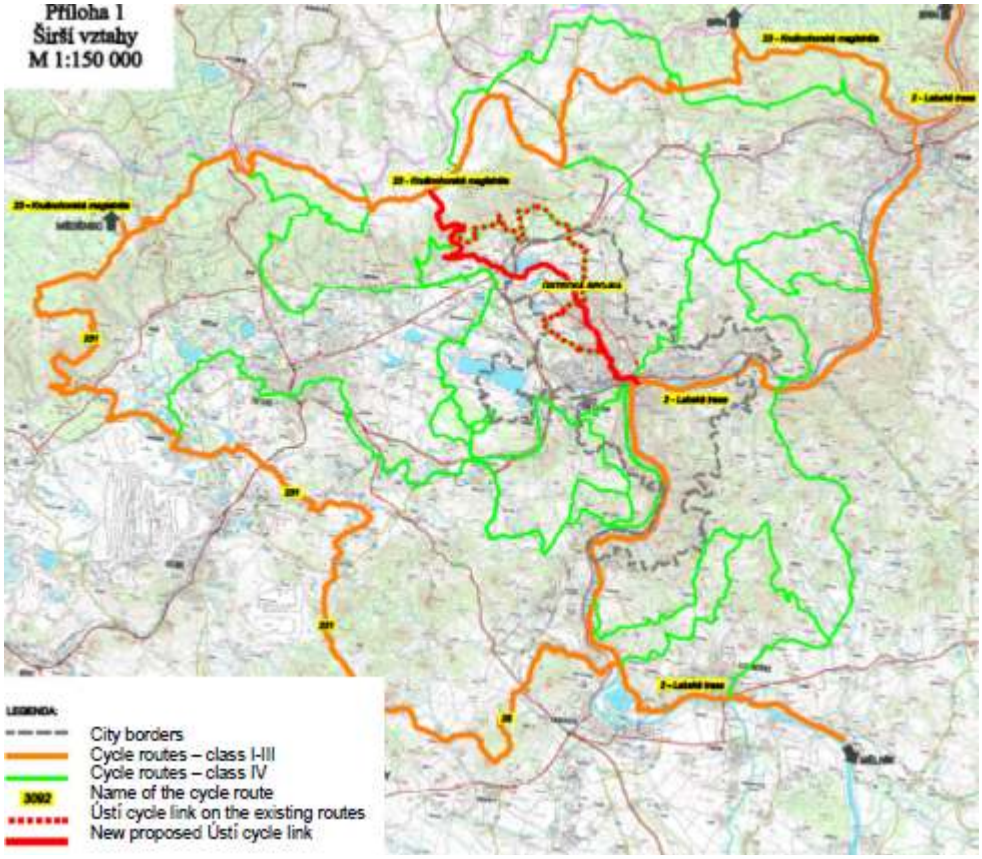
The actions to achieve the above targets will be:

- To improve information about cycle transport for the local population,
- To create a web portal for cyclists,
- To link the existing cycle infrastructure to the more complex cycle network.

**Findings**

**Linking the existing cycle infrastructure**

In order to achieve the above, a design and implementation plan for cycle transport improvements was created. This included a feasibility study of linking the two existing cycle routes in Usti; the Ore Mountains route, and the Elbe River route.




The proposal of the Ústí cycle link is based on:

- Marketing Study of Cycling in Ústí Region (Varia Ltd., 2007),
- Update on the Network of the Cycle Routes in the Ústí Region (Budínský, 2009) and the route research study, Cycle Routes in the City of Ústí nad Labem (Budínský, 2001),
- Field survey

Data from these studies formed the two scenarios and compared them on a basis of:

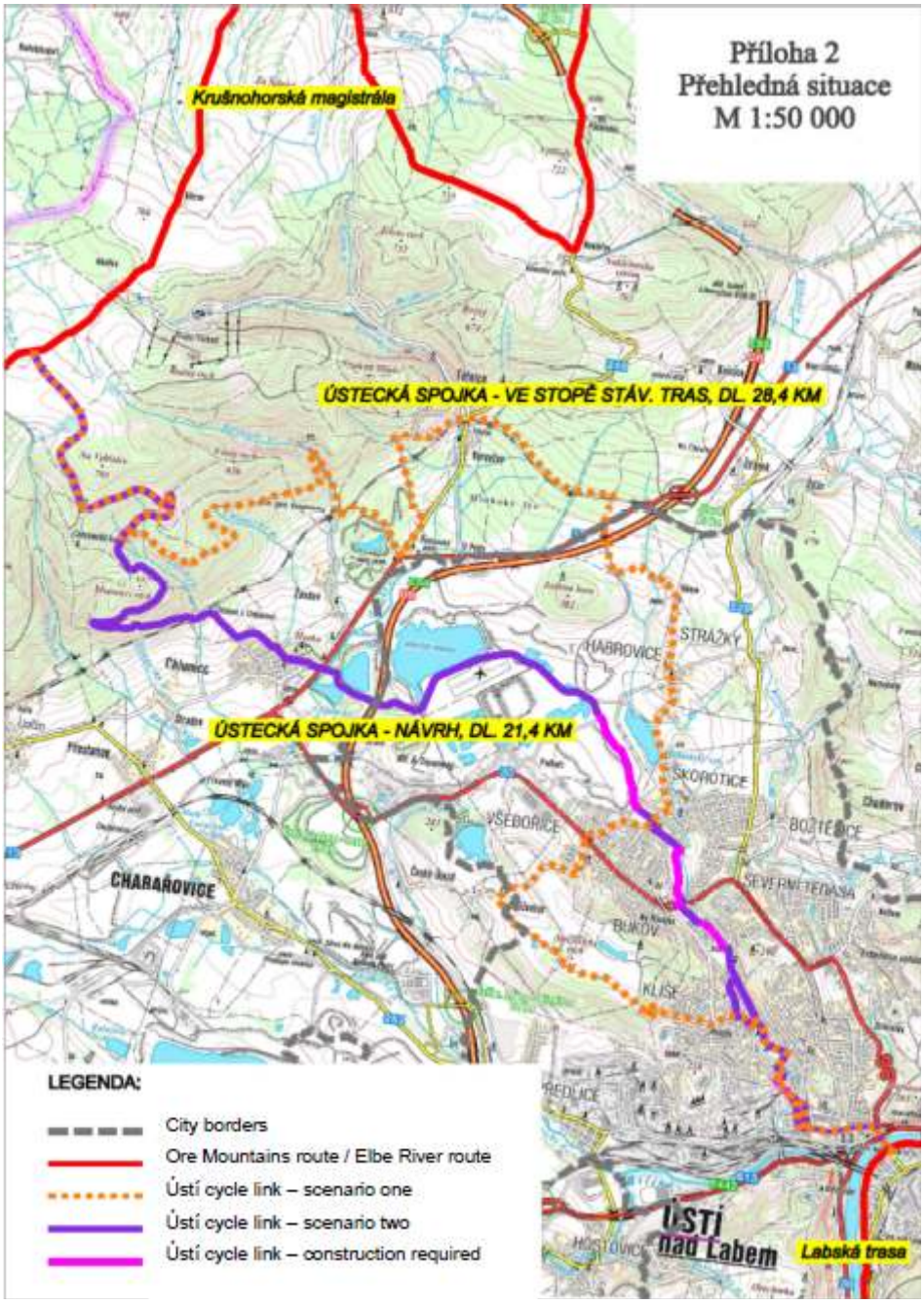
- Vertical profiles
- Route length
- Separation from motor traffic

Two scenarios were formulated to link these existing routes:
**Scenario One**:

- Utilising existing cycling infrastructure
- Convenient
- Some resurfacing required

**Scenario Two**:

- Newly constructed cycling infrastructure
- Shorter route
- Flatter route
- Route improvements and resurfacing required




**Web Portal**

The web portal will include information about:

- Cycling opportunities
- Cycle services
- Areas of interest

There will also be interactive cycle maps on the website.

Comments and feedback about the portal is currently being collected and will be used to update and improve the web page which will subsequently be upgraded as a separate task.

## 4.4 Deliverable R61.1

**Car Sharing Scheme Improvements in Monza**

Monza introduced a car-sharing scheme in April 2007, in agreement with the Province of Milan's commitment to introducing this new approach to urban mobility. Currently, there are three cars associated with the car-sharing service located in two of the five Districts of the town. There are a total of 54 private subscriptions to the car share service.

This measure is aimed at implementing a marketing strategy in order to increase the awareness of this new form of access to car use and the number of car-sharing service subscriptions in the five districts of the city.

**Approach**

In order to establish the current situation in Monza and to assess user needs for future planning the research methodology has been broken down into two stages:

**Research - Study of a marketing strategy to show advantages of car sharing:**
Monza has conducted a study of barriers to the use of car sharing in order to promote the extension of car sharing in the five districts of Monza.

Stage one: a precise analysis of available data about the city of Monza concerning:

- socio-economical characteristics of residents (private, commercial and enterprises);
- accessibility and urban mobility;
- organization of people's time, services and quality of life in the city .

**Demonstration - Car Sharing Scheme Improvements:**
Monza will then issue a subcontract for specialist expertise to actually develop a marketing strategy to increase the awareness of this new form of access to car use and the number of car-sharing service subscriptions in the five districts of the city. Monza, will as part of ARCHIMEDES, implement the strategy.

Stage Two: Survey of user needs.

According to the results of the study, a marketing strategy has been developed in order to increase the number of subscriptions to the car sharing service in Monza. In addition, a more rational positioning of car sharing vehicles in the city has been defined, in order to locate them where accessibility is guaranteed to a higher amount of potential users.

**Findings**

A car sharing service in Monza was first launched on May 8$^{th}$ 2007 with three cars: two of them were located in the historical centre, in Piazza Roma, 50 metres far from the Municipality offices, whilst the third one was in Piazza Castello, not far from the railway and bus station, which is the most important transport interchange in Monza.

The two cars located in the historical centre were used on working days during office hours primarily by the bank Unicredit which had bought prepaid packages of half-exclusive use from 9:00am to 17:00pm and was located adjacent to the banks parking place. The car in front of the

station was available to all citizens' all day long. All three cars were available to all citizens' disposal during evening hours and at weekends.

Since the beginning of the car share service, some additional benefits have been granted to users of the car sharing service in the city of Monza. More specifically, car sharing vehicles have been allowed:

1. to enter limited traffic zones,
2. to use lanes reserved for public transport,
3. to operate during days when traffic is banned (usually because of high pollution levels) and
4. to have free access to parking areas where it is normally necessary to pay.

A second step was made in 2008 when the city of Monza was allowed to use a regional grant to buy packages of car sharing use to answer to mobility needs of district offices and to implement alternative mobility modes between citizens. Thanks to this opportunity, since December 2008 one of the already existing cars was located in District 4 and a new one was added in District 5, close to the Municipality district offices, available for both citizens and employees during working hours: for this reason Comune of Monza bought prepaid subscriptions in order to allow its employees to use the service, but also aiming at guaranteeing to the manager of the service, formerly Car Sharing Italia, the backing of maintenance costs.

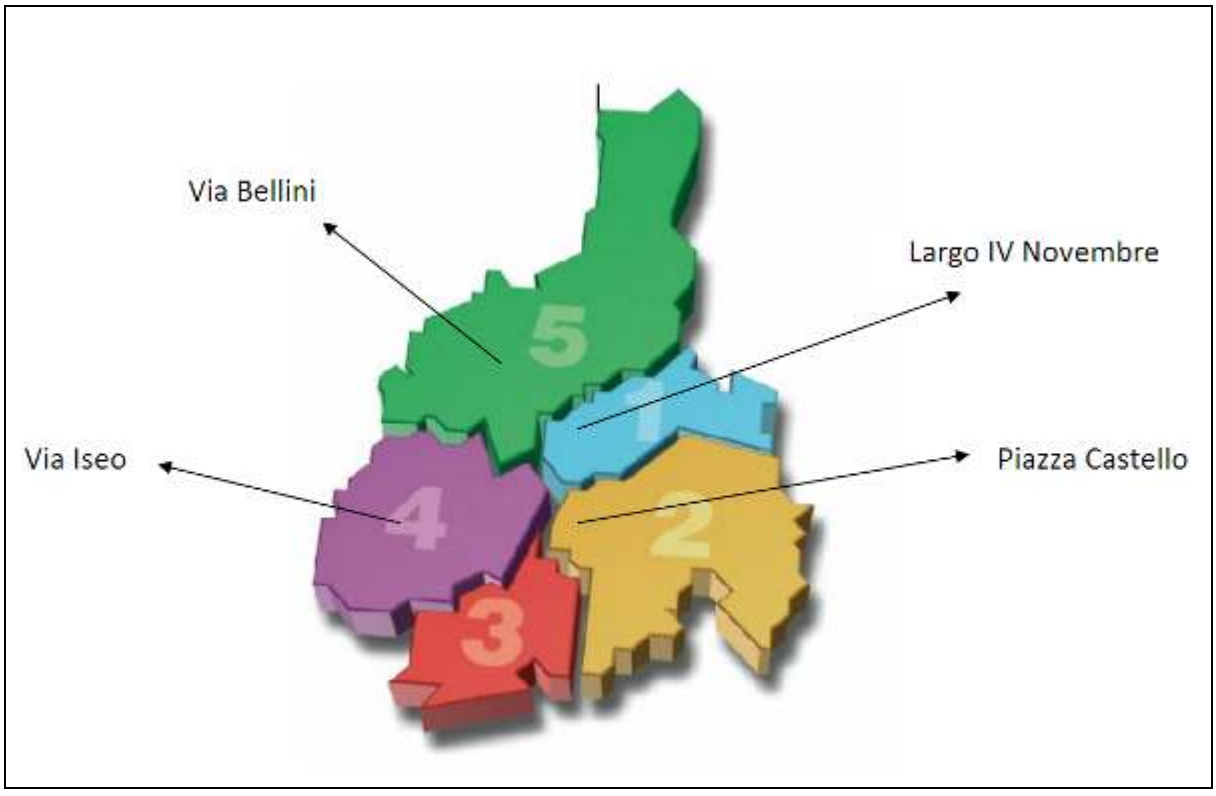



**Figure 1 - Monza Districts and car sharing vehicles location before marketing campaign**

Unfortunately, parking areas near the District offices (Via Bellini and Via Iseo) registered very little use and generally service, even in central areas, came to a standstill, especially since the beginning of 2009.

A second relevant aspect of little use was partly connected to the expiry of the contract with Unicredit Bank of Monza, which had been an important customer since the beginning of the car share service. Unfortunately, in spite of the high satisfaction from local management, the contract was not renewed under request of the central direction in Bologna as part of company reorganisation. This situation shows, on the one hand, a weakness of actual users of service, and on the other the potential importance of business customers to the scheme.

For these reasons, the company managing car sharing service had decided that four cars in Monza were too many to guarantee the backing of maintenance costs, so the two cars in Districts 4 and 5 were removed, whilst the other two (in Piazza Castello and Largo IV Novembre) were left. However, at the beginning of ARCHIMEDES project, Car Sharing Italia merged with GuidaMI, the society controlled by ATM (Milan Public Transport Company). Dealing with a bigger company, with many cars located in Milan, it was easier to activate a new contract, since economies of scale reduced the total cost and allowed the company to keep cars in Monza although use was not particularly remunerative.

This situation, together with results from the two research stages paved the way for the development of the marketing campaign.

### 4.1.2 Activities of Communication and Marketing in Monza at the beginning of car sharing service

Since its inception, the car sharing service in Monza has been supported by communication and marketing activities which, after considering the target characteristics and available budget, have exploited three preferred channels:

- distribution of informative leaflets in shops, libraries, public offices, private buildings;
- press releases in local newspapers in agreement with Comune of Monza and Province of Milan;
- events organised with the cooperation of local agency for environmental protection called ‘Legambiente’, especially during the biological market which is organized once a month in the historical centre of Monza.

This approach has exploited drivers of management (coordinated image and communication campaign carried out in Milan) and of local administrations (widespread presence on the territory and institutional value). At the beginning the target of the marketing campaign was all the population, in order to launch the service, with the aim of identifying, after a first period, a more specific target of potential users of car sharing service.


**Figure 2 – Front and rear of flyer for launch of car sharing service in Monza**

Exploiting an initiative launched in Milan, a Christmas campaign was activated, sending the message that a car sharing subscription could also be an original Christmas present.


**Figure 3 - Flyer for Christmas promotion**

### 4.1.3 Target Groups Identified

Results from the data collected in Stage One of the research project showed that in Monza potential car sharing users were private (both young and mature people) and business people (enterprises and professional).

Characteristics of private users can be compared with those of European users of car sharing schemes and are confirmed by surveys carried out by Car Sharing Italia. Within the private user target there are different typologies of users, which can be divided in two different categories:

- the mature user, usually married with children, who already own a family car but needs another one to satisfy new necessities (new job for one of the family member , children with new driving licence etc;
- and the young user, with limited assets but an active social life, who needs a solution to their mobility needs (new house, new job etc.

These two type of users have one common characteristic: both consider the choice of car sharing at the arrival point of a change in their lifestyle, when people need a new, preferably innovative, solution to their travel requirements.

Another interesting result comes from several studies dedicated to mobility and quality of life, specifically from an analysis conducted by SWG (a leading Italian society for surveys) in 2006. In this analysis, Monza is considered a city on a human scale, which has grown up in a short period of time without an adequate growth of public services. Primarily, survey respondents had a perception that the City lacked organisation in mobility, which represented the most critical problem for citizens because traffic was their hardest daily challenge. As a direct result of this perception, residents of Monza would not shift from private car to public transport at the

moment, even though people declare a strong environmental sensitiveness. People also expect that the Municipality will intervene to improve and strengthen public transport and to invest in alternative modes (bicycle, car sharing…).

In focus groups held by SWG it appears that young people are more conscious than older people about the opportunity to reduce their use of private cars in order to promote more sustainable mobility. Information is a particular issue: citizens complain about inadequate information on new initiatives about mobility, which are often disseminated by word of mouth.

Other potential users of car share service are:

- businesses, which can adopt car sharing both as a substitution of part of their fleet or as a benefit for their employees or customers,
- other professionals, who can avoid buying a car by choosing car sharing. This opportunity is strongly attractive since for VAT registered professionals, owner costs for car sharing can be deducted from taxes.

## 4.5 Deliverable R62.1

**Planning of Cycling Strategy Study in Monza**

Over the last five years Monza has invested in creating an important infrastructure for cyclists. This network is not yet fully interconnected, but the number of cyclists has been increasing for some time.

The implementation of this measure will allow a significant boost to develop soft mobility (also known as smarter choice) measures in the area, continuing to promote bicycle use as a cost effective way to reach important Mobility nodes. In addition, cycling offers advantages of both improved health and as well as greater energy-efficiency cycling is an ideal mode of transport for medium-sized areas, such as Monza.

**Approach**

The aim of this study is to provide a number of general and technical recommendations in order to plan strategies and actions in support of improving cycling mobility in Monza. The creation of a complete cycle network, even though it will take some years to be achieved, will require:

- Infrastructural interventions on the cycle network;
- Interventions for the improvement of complementary services, like parking facilities, rentals, repairs and maintenance;
- Communication interventions and “marketing” of bicycle use.

The realization of cycling routes is often not enough to hit the target of shifting the urban modal split towards forms of sustainable mobility, as alternatives to the use of a private motorized vehicle; the realization of these infrastructures must come together with a series of stimuli and incentives. On the other hand, the use of promotional and marketing campaigns to promote cycle use might prove self-defeating when users do not find the right conditions; i.e. when the infrastructure is not there to support their choice.

## Findings

### Structure of the study

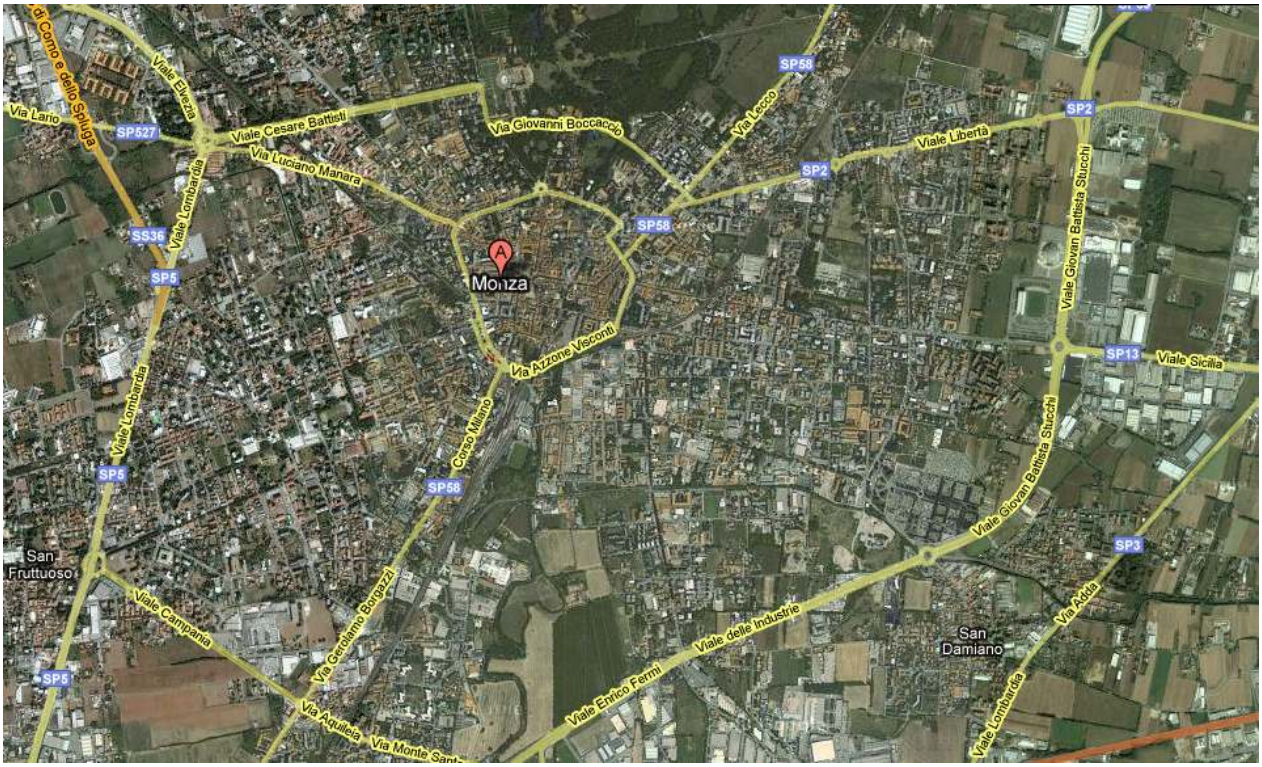
In order to meet the study aims, the study has developed the following themes:

1. An examination of the current cycling in the city of Monza; (consideration of strengths and weaknesses of the infrastructure, its safety and its accessibility)
2. Consideration of a proposed cycling network,( integrating the present with a series of possible routes) based on what has already been proposed in the General Urban Traffic Plan, currently being updated by the municipality ;
3. Consideration and development of cycling routes, considering the value of different types (restricted bikeway, bike lane, multi-use path, etc.) and proposing solutions to possible conflicts with the road network (crossroads, road signs and markings, traffic dividers, etc.), in order to adopt a consistent approach of action across the whole cycle network;
4. Identification of suitable actions to promote sustainable mobility in the city, in order to reduce the use of private motorized vehicles and making cycling more appealing;
5. Investigating the opportunity of launching a 'Bike Sharing' service in the city.

### Strengths and weaknesses of cycle mobility in Monza

### Strengths

- Monza is largely flat
- There are districts circling the city centre which allow short/manageable journey times (most residents live within a 5km diameter around the city centre)
- There is already a strong demand for cycling
- There already exists a network of cycle routes (despite incomplete)
- System of residential areas located away from huge traffic flows.



**Weaknesses**

- The current cycle network really only amounts to a collection of unconnected cycle paths that do not lead to popular destinations
- The density of built-up areas and the presence of narrow/one-way roads
- Natural barriers (the river network)
- Artificial barriers (freeway network and railway)
- No direct routes for cycle paths to follow

**Additional problems**

- lack of coordination among stakeholders in the area
- little or no improvement in complementary cycle services
- little or no integration with other modes of transport
- little or no successful marketing actions

**Framework for Urban Cycling**

The aim of the framework is to provide guidelines for planning and realisation of:

- a cycle network,
- the restyling of existing cycling routes, both main and secondary paths, either as bike lanes or shoulder cycling routes or cycling routes placed inside an environmental precinct.

These guidelines will be a useful and effective instrument for Municipality Technicians in charge of cycling mobility, but also of private societies which could possibly undertake the development of cycling routes within the territory of Monza.

The framework will include details of:

- Types of cycle routes
- Elements and important problems of the cycle network (crossroads and pedestrian crossings, traffic drivers)
- Additional services (road signs, bike parking and bike services)

**Planning the Cycling Network**

Identification, availability, continuity and safety are essential prerequisites of a cycling network, and they must be carefully considered in the preliminary phases of the project.

The variables involved in the study in order to develop a cycle network are:

- the proposals contained in the General Urban Traffic Plan which is currently being updated by the municipality of Monza;
- the rationale for each bikeway, (route fulfilling specific target of the path, connection between districts, connection to schools or public offices, local connection, etc) but also the general target of serving all the connections which are not served yet;
- the choice (which is still preliminary at this stage, and will have to be checked in the advanced stages of the project) of the type of cycle route to be built, according to the dimensions and functions of the infrastructure that the route will have to serve.

The realisation of the paths of the advanced cycling network – as planned in the project – would bring the cycling network to a higher level of service with regard to the accessibility of attraction centers identified in the preliminary stage of analysis.

Assuming that each centre of attraction is served by the cycling network if the distance between a bikeway and the centre is less than 100 m (see the circle buffer areas around the junctions, in the tables), thereby the proposed cycling network would serve 80 % of the city attraction centers, compared to 30 % currently.

The effectiveness of the agenda for the realization of the “Bike Plan” of Monza will be judged on its capacity to increase the number of journeys made by bike by residents.

**Steps Towards the creation of a “Cycle Network”**

- Cycling as the ground of multi-modality in Monza
- A global vision: Integrating cycling with other forms of transport as a strategy for inter-modality
- Increasing pedestrian and cycling mobility
- Criteria for the creation of a cycling network:
    - Characteristics of a good cycle path
    - Restyling existing cycling routes
    - The creation of environmental precincts
    - Bike parks and other services for cycling
    - Information and marketing

# 5. Conclusions and Recommendations

## 5.1 Main Research Outcomes

**Approach to Research**
Research of mobility services and energy saving modes has focused in these measures upon the following activities:

- Best practice/case studies
- Reviewing/evaluating current provision
- Practical on-street studies

In all of the cities there has been some form of mobility service/energy saving mode already present, such as car clubs/car-sharing services, cycle networks/infrastructure, and vertical transport. The research has therefore been about examining what has already been achieved, and assessing how to expand and improve upon it from one or more of the following perspectives:

- technical quality,
- scope,
- promotion and marketing of the offering.

**Findings of Research**
Although the specific topics covered by the research into Innovative Mobility Services and Sustainable Modes in the ARCHIMEDES cities were quite diverse, there were some clear research outcomes spanning across all 5 measures.

In particular, it is clear that when planning the introduction or improvement of mobility services and sustainable modes it is importance to consider/have:

- Good partnerships
- Reliability of service/provision
- Accessibility/Convenience
- Publicity/information
- Part of an integrated transport system
- Population served/demographic characteristics
- Attractiveness
- Demand for service/provision

In all cases, the energy saving modes were already established in the cities and are viewed as positive initiatives to move forward with. The emphasis has therefore been upon increasing accessibility and awareness of the schemes, as well as improving the extent or quality of provision. This helps to promote the modes, and encourage modal shift.

However, this type of approach is undoubtedly a long-term strategy. It has taken 20 years of continuous political support, determination and incremental investment to develop the cycle network in Donostia - San Sebastian (see ARCHIMEDES Deliverables T24.1, T24.2 and T24.3) to the point where it is approaching the point where it is a comprehensive network that can offer a realistic alternative for the majority of journeys in the urban area. It also needs to be recognised that this type of measure is primarily an 'enabling' measure, in that this type of alternative mobility solution may be provided but often it will not be used to its capacity unless properly researched and designed to meet an actual need of the travelling public and then actively promoted as such.

## 5.2 Problems Identified

The main problems identified from research into mobility services and sustainable modes related more to the difficulty in changing people's behaviour and ensuring relevance to a large enough proportion of the population to ensure viability, rather than technical issues with the modes / services being offered; for example:

- Lack of acceptance/awareness (particularly concerning car sharing schemes)
- Lack of critical mass/demand for service (car sharing)
- General problems with satisfying a variety of different needs
- Financial viability of scheme (primarily car sharing in B&H)

The primary more technical issue concerned physical/engineering barriers, particularly integrating new and existing infrastructure, for example integrating new cycle routes into current infrastructure

The actual implementations within the ARCHIMEDES project have tended to be relatively small in scale (small capacity or geographic area covered) compared to each city's overall mobility system. As such they need to be treated as innovative trials. Isolating their impacts within the overall mobility system can be very difficult (even if the level of impact for an individual journey is significant) and is a problem that will need to be addressed within the evaluation of each measure.

## 5.3 Mitigating Activities

Key mitigating activities identified to help overcome the above problems and increase levels of uptake and hence patronage were:

- Wherever possible to link measures with other established initiatives / well known mobility brands to help with the promotion of the new measures
- Dissemination of evidence on cost-effectiveness (e.g. car sharing) to show potential users the direct benefit for them
- Discussions/links with professionals, organisations, and community groups to ensure input from the travelling public at the design stage (so that designs are not just technically valid but also address real user needs)
- Increasing convenience of registration/administration via online resources and information
- Making information more widely available

The effectiveness of these steps will need to be judged as an element of the evaluation when it becomes available.

## 5.4 Common Themes in Relation to Innovative Mobility Services and Sustainable Modes

A dominant theme in relation to innovative mobility services and energy saving modes is their place within integrated transport systems. Key to any new transport services, including car sharing, cycling, and vertical transport, is that it links up with the current infrastructure and complements existing services. For this reason it is also a common theme that new services must have good partnerships with existing groups, organisations etc. in order to unify the transport system.

Another common theme in relation to this topic is that of publicity and promotion. In terms of innovative mobility it is important that the target users are aware and understand the service which is on offer. Car sharing, for example, may not be a concept that the general public are familiar with, so the provision must be supported by clear and effective marketing and publicity. With extensions/developments to a cycle network demand for and acceptance of the existing network provision may already be present, but a lack of awareness as to any change would hinder use of the new elements unless properly publicised.

Finally there is an over-arching theme of the awareness and acceptance of innovative transport systems. It can be argued that the infrastructure of innovative services must be in place before demand can take off, and that a shift in modality, as well as social acceptance may only be achieved slowly over time, although the speed of this will in part depend on the strength of the policy and communications support that accompanies the individual measures.

It is also worth noting that for some of the measures covered in this topic energy saving is not the primary objective but rather a beneficial secondary effect. For example, for car sharing schemes energy impacts might result from increases in the average level of occupancy leading to a smaller number of total trips or some trips being changed to public transport or non-motorised means because the habitual use of one's own car for all trips is broken. As another example, increases in cycling might be promoted in order to increase levels of personal fitness and overall health targets and / or to reduce the number of car trips and hence reduce congestion, with reduction in transport energy use being seen as an incidental benefit.

## 5.5 Future Plans

Future plans for all the measures focus around further study and analysis leading to implementation of the measures in the manner considered most appropriate (as long as certain basic criteria are met).

With this analysis there will inevitably come further development and broadening of scope for many of the projects. In many cases the research element was the first stage of initiative to be followed by implementation and improvement.

Future plans will also be affected by the take-up/success of each initiative. In the case of Car Sharing in Brighton & Hove the research showed any implementation to be unattainable at present, and therefore any future plans would be entirely dependent on the current situation changing.
With the case of Car Sharing in Monza, development of the service will be entirely dependent on demand. As the number of subscription increases, the provision will be able to expand, incorporating marketing plans for promotions and social networking.

Evaluation work on each initiative will yield a clearer understanding of the barriers and drivers surrounding mobility services and sustainable modes.

Implementation and evaluation will be documented in subsequent ARCHIMEDES deliverables.