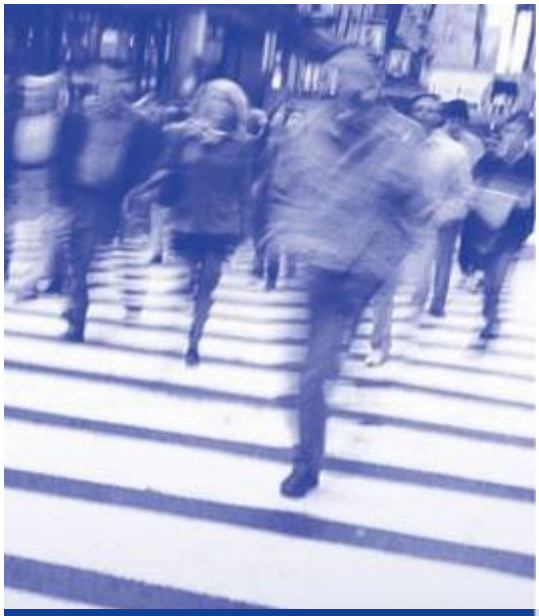

CiViTAS
Cleaner and better transport in cities

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

D5.1 – Development and Experience of Safety and Security Demonstrations in ARCHIMEDES

November 2012

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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.

Safety and security is one of the eight categories within CIVITAS ARCHIMEDES. Safety and security make sustainable transport options feasible and attractive. CIVITAS cities are looking into new ways to ensure the safety of urban travellers, especially cyclists, pedestrians and the most vulnerable groups such as children and elderly people. Initiatives include for example traffic calming, improved cycling infrastructure and anti-vandalism activities.

Making it safer and easier for people to take public transport, walk or cycle short journeys is a key part of integrated transport strategy and European transport objectives. Both pedestrians and cyclists are vulnerable road users so improving their safety is an important element in any strategy for sustainable and energy-efficient transport. Improving the quality of public transport infrastructure is an important measure in cities where competition from private modes undermines advantages for vulnerable citizens of safe, secure and clean collective passenger transport.

- To ensure a safe environment for pedestrians and cyclists;
- To reduce the number of casualties as a result of roadside accidents;
- Increase accessibility of public transport;
- Increased quality of urban space and prioritise safe, secure and clean collective modes; and
- Increase compliance with safe speed limits.

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 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 which was finalized in October 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 93.95km^2. 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 demonstration activities conducted in relation to workpackage 5 of the CIVITAS ARCHIMEDES project – Safety, security and health.

3.1 Introduction to the Measures

Research and demonstration activities in respect of safety, security and health were conducted in five of the ARCHIMEDES cities, namely Aalborg, Brighton & Hove, Donostia - San Sebastián, Iasi and Ústí nad Labem, in the form of measures 42, 43, 44, 45, 46, 47, 48, 49 and 50. These measures are introduced in the following sections.

The results from the individual measures are reported in detail as follows:

Measure No:	Research Deliverables	Implementation Deliverables
42		T42.1
43		T43.1
44		T44.1
45	R45.1	T45.1
46	R46.1	T46.1
47		T47.1 T47.2
48		T48.1 T48.2
49	R49.1 R49.2	T49.1 T49.2
50		T50.1

This deliverable draws together the experiences gained from the individual measures and presents the common issues and conclusions that can be drawn at the workpackage level. Further information and outcomes of the measures can be found in D10.3 Final evaluation report and D12.4 Final version of measure level result templates.

Measure 42: Provision for Soft Modes in Aalborg

Aalborg promoted the area at the new Civic Centre, Nordkraft, and the new House of Music as an attractive, recreational and safe area for vulnerable road users. The aim was to manage traffic to better reflect vulnerable road user needs. The specific features of the measure were: removal of traffic lights, decreasing road width, implementation of 30 km/h zone, construction of different kinds of pavement and re-design of the urban space.

A main road separating the city centre and the waterfront was narrowed from 4 to 2 lanes, to encourage cars to choose the alternative ring road. The road Østerbro, at one side of the Nordkraft Civic Centre, was redesigned and reconstructed as a Shared Space road. This road is shared by cars and cyclists, and an area is allocated to pedestrians. Since it is a shared space, the areas are not separated by kerbs but instead marked out by different kinds of pavement. This is done to make motorists aware of other road users and hence lower their speed.

Measure 43: Traffic Speed Reduction Zones in Aalborg

Aalborg established five speed reduction zones with 30 km/h and 40 km/h speed limits in the ARCHIMEDES corridor. The reduced speed level aimed at increasing general traffic safety and ensuring a better environment for particularly vulnerable citizens such as older and disabled people, and children. It was decided to test several innovative and new traffic speed reduction measures such as flexible bollards, `pillow bumps` and an entire traffic speed reduction zone using only signage.

Measure 44: Road Safety Campaign in Brighton & Hove

This measure aimed at improving road safety and reducing casualties at high risk sites. This was implemented through physical road safety measures and a publicity campaign to increase road safety awareness in groups of people statistically most at risk of injury in collisions. The high risk groups and causes of collisions were identified. The London Road and Lewes Road corridors were identified as locations where these groups were at most risk of being injured in collisions. These are two key areas in the city with a high volume of shoppers and road users.

The selected junctions were re-designed to de-clutter the area and improve visibility at junctions for all road users. Further road safety measures included radio feeds, lamp post banners and cycle code leaflets.

Measure 45: "Bike-Off" Cycle Anti-Theft Scheme in Brighton & Hove

To reduce cycle theft and increase uptake of cycling Brighton & Hove City Council (BHCC) piloted a 'Bikewatch' initiative. This investigated whether supporting cycle related community activities and installing secure cycle parking facilities could increase security of parked bicycles, reduce cycle theft and increase cycle use. BHCC selected 20 sites within Brighton & Hove's CIVITAS corridor, located in areas where cycle theft was an issue and cycle parking was needed.

Part of the measure consisted of a review of best practice across Europe and the UK regarding cycle parking provision, as well as research to understand the local context concerning cycle parking and security, and inform the design of the innovative measures. Finally, a robust monitoring and evaluation plan was developed.

Measure 46: Safe districts and 30 kilometre zones in Donostia - San Sebastián

The measure aimed at increasing road safety by reducing the average speed of motorised vehicles, and providing safe crossing points for pedestrians and cyclists. This was an innovative measure that took advantage of the opportunity arising from recent changes to Spanish law regarding 30 km/h zones. The measure incorporated a research task, including a review of best practice to prepare designs for all demonstration elements. The research task addressed safe districts and 30 km/h zones, development of a road safety pact with citizens and installation of radar systems. Subsequently safe districts and 30 km/h zones were implemented.

Figure 2: The newly implemented 30 km/h zone in Donostia - San Sebastián.

Measure 47: Road Safety Measures in Donostia - San Sebastián

This measure included the Road Safety Plan for Donostia - San Sebastián. The features were awareness raising campaigns, post-accident attention services, and observatory for monitoring progress and coordinating traffic safety data from all stakeholders. The measure addressed traffic safety improvement by also establishing a Citizen Road Safety Pact, which involved civic associations and other stakeholders in urban mobility. To enforce speed limits radar systems were installed at two locations and a red light control system at one location within the frame of district traffic safety plans.

Traffic safety studies were carried out to improve traffic safety in the district of Intxaurrondo. The Traffic Safety Plan for Intxaurrondo included several physical interventions to reduce speed, introducing a new speed limit of 30 kph.

Measure 48: Provision for disabled persons in Iasi

The high number of traffic accidents involving visually impaired citizens led Iasi City Hall to propose the installation of special audio systems. In the current traffic management systems there are no devices to aid visually impaired people in crossing streets.

Figure 3: New bus stops in Iasi are designed for disabled people.

Measure 49: Road Safety Measures in Ústí nad Labem

In 2004, a resolution of the Government approved the National Road Safety Strategy (NRSS), which, in accordance with the strategy of the European Union, defines ambitious objectives. The objectives for safety improvements set by the Government in 2004, such as reducing the number of deaths resulting from traffic accidents between 2002 and 2010 by half, have not been met. It appears that neither legislative changes nor introduction of harsh penalties (realised via the system of negative points for drivers) are sufficient to bring about the desired effect. The final report from a Safety Audit (task 11.5.3) identified specific road safety deficiencies, mainly:

- List of places with a statistically high rate of traffic accidents;
- List of places with potential safety risks on major roads;
- List of places with potential safety risks by school facilities.

Another task was a feasibility study for implementing calm zones with speed restricted to 30 kilometres per hour. This research was based on the experience of the lead cities and other European cities. Finally, a traffic speed reduction campaign was initiated.

Measure 50: Mobility Improvements in Ústí nad Labem

The city of Ústí nad Labem has goals to improve conditions for disabled and vulnerable road users, and to introduce mobility services promoting road safety. To fulfil the mobility requirements of citizens with limited mobility, the construction and modification of buildings and public spaces must satisfy legal standards and technical regulations.

'Barrier free routes' were identified to be suitable for carers with children in pushchairs, older people, and people with reduced mobility. As a further initiative for providing citizens - and especially those with mobility disabilities - with improved mobility opportunities, Ústí nad Labem developed a web

portal for the 'barrier free routes'. Most of the access routes in the city centre are already barrier free, but many citizens deemed to be vulnerable were not aware of these options. People with limited mobility were often unable to seek suitable access routes by themselves. The web portal aimed at improving this situation by providing the access routes online.

4. Analysis

4.1 Comparison of Measures

The 9 measures cover a broad range of safety and security projects and can be categorised into 5 overarching themes. The measures consist of physical changes to the urban environment to improve safety and security, mobility improvements for vulnerable road users, and road safety campaigns.

Cycle Anti-Theft Scheme
The implementation of the "Bike-Off" Cycle Anti-Theft Scheme in Brighton & Hove aimed at decreasing the rate of stolen bicycles in the city. The scheme also sought to communicate good cycle locking practice to existing and new cyclists, and implement secure cycle parking to facilitate good cycle locking practice. Innovative cycle parking measures were introduced at 10 high-risk sites, in conjunction with a high profile publicity and awareness campaign.

Traffic Speed Reduction Zones
In Aalborg the speed reduction zones aimed to reduce the number of injuries in traffic accidents. They also aimed to ensure a better environment for particularly vulnerable citizens such as older and disabled people, and children.

In Donostia - San Sebastián the aim was to promote the coexistence of the four main mobility actors: pedestrians, public transport, bicycles and motor vehicles. Naturally the priority was to favour sustainable transport as far as possible, so that noise and emissions could be reduced. Another major objective, in conjunction with the Road Safety Pact, was to promote safety and reduce the accident rate.

Provision for Vulnerable Road Users
In Aalborg, the aim was to manage traffic around new, multiple cultural activities in terms of soft road users. More specifically, the aim was to reduce the number of accidents involving cyclists and increase the accessibility of public transport.

In Iasi, the aim was is to install and operate devices that could help visually impaired people to integrate with traffic. To ensure safety for a particularly vulnerable group of road users:

- 40 Audio Warning Devices for visually impaired people were installed;
- 50 bus stations were modified to allow easier access for disabled persons;
- 10 minibuses were converted to allow easier access for disabled persons.

In Ústí nad Labem, the aim was to support use of sustainable urban transport modes, increase safety of transport in the city and improve accessibility for all city residents, including residents with mobility restrictions. The objectives of the task were to provide:

- Access routes for citizens;
- Information on security issues and the quality characteristics of each route
- Alternatives for city mobility.

Figure 4: The shared space at the new cultural centre, Nordkraft in Aalborg.

Road Safety Campaigns

By raising awareness of different road users in Brighton & Hove, the aim was to change attitudes and behaviours causing collisions and encourage good road safety habits, so everyone was safe. The campaign aimed at helping to prevent collisions on two of the city's busiest roads with the message for all road users to 'look out for others' and to 'share the road, share the responsibility, and make it safe'. The campaign was followed by implementation of innovative road safety engineering measures at 4 high risk sites in the CIVITAS area to improve safety.

In Donostia - San Sebastian the aim of the measure was to reduce fatal accidents and serious injuries by 50% compared to 2002 figures and to reduce the risk of accidents by 50% for all modes of transport. A Citizen Road Safety Pact was established to improve safety and security. The qualitative objectives aimed at increasing levels of awareness, acceptance and percieved higher levels of safety.

In Ústí nad Labem, the national objectives of reducing the number of deaths resulting from traffic accidents by half in the period 2002-2010 have not been met. The objectives were to:

- Reduce the amount of urban traffic accidents and their consequences through road safety measures;
- Reduce traffic speed;

- Over the long term, increase the safety level on local roads, encourage walking and cycling in the city and improve the urban space.

4.2 Differences in Approach by City and Activity

Research and preparatory activities were conducted in three of the ARCHIMEDES cities, namely Brighton & Hove, Donostia - San Sebastián and Ústí nad Labem.

The measures of safety were linked to two overall purposes; to prevent accidents and to control and sanction infringements. Prevention of accidents were coped with either by integrating various road users while decreasing and uniform speed levels or by separating road users and maintaining speed differences -

Prevention of accidents aimed at decreasing collisions between:

- Vehicle and infrastructure;
- Vehicle and vehicle;
- Vulnerable road users (e.g. pedestrian, cyclists);
- Vehicle and vulnerable road user (VRU).

This strategy can be pursued by:

- Physical interventions in infrastructure to induce desired behaviour;
- Design and changes in the surrounding environment with regard to improvement of overview and acknowledgement of risks;
- Signing in order to decrease speed levels.

A further sub-division of the safety measures was in integration, i.e. shared spaces where the speed is based on the premises of the soft modes, or separation of traffic, i.e. separation of road, cycle path and pavement.

The strategy of control and sanctioning of infringements can be pursued by automated systems for control and fining or by police enforcements.

The security measures were linked to intentional attack on people, personal belongings and property. The basic tools were video surveillance, alarm, police mobilisation, lighting and anti-theft protection. The majority of the measures in this workpackage were related to safety.

The measures of mobility improvements for vulnerable road users were linked to physical improvements of the urban infrastructure. They included addressing obstacles relating to high kerbs, soundless traffic lights, and physical design of public transport vehicles and accompanying stops and stations. The target groups of the measures, vulnerable road users, are older and disabled people.

The measures of road safety campaigns were linked to campaigns for increasing awareness and acceptance among the various road users. Involving different stakeholders, e.g. decision makers, transport planners, citizens, PT companies and the strategic work of synthesising a road safety pact were key features of the measures. Other initiatives included visual and audio advertisements, signs, and meetings.

Cycle Anti Theft Schemes - Increasing Security

In Brighton & Hove, the BikeOff' anti cycle theft project launched a high profile publicity and awareness campaign in the city (population of around 250,000) to reduce cycle theft. 'Bikeoff' initiative materials, interactive communication tools, a Weblog, and community events were aimed specifically

at 1,400 residents living in and around areas with high risk of cycle theft. The task consisted of three parts:

1. Review of best practice across Europe and the UK in relation to cycle parking provision;
2. Research to understand local context regarding cycle parking and security;
3. The development of a robust monitoring and evaluation plan.

'Best practice' in relation to cycle parking provision is defined as provision that is either innovative in its design or exemplary in its proven success, or both. The methodology used to identify and illustrate best practice regarding cycle parking provision across Europe and the UK included the following, staged activities of 65 cycle parking facility case studies:

- Establishment of a typology of cycle parking provision;
- Creation of a review framework for cycle parking provision;
- Identification and selection of exemplary cycle parking provision;
- Creation of exemplary case studies;
- Comparison of case studies and summary of findings.

The local research comprised both secondary and primary research. Secondary research drew upon precedent research into cycle theft, by the BikeOff Research Initiative between 2006-8 in the North Laine area of Brighton & Hove, and analysis of Sussex police cycle theft data. Primary research included qualitative scoping observations, and consultation and collaboration with stakeholders including police, council officers, councillors, cycling advocates and community safety agencies.

Furniture designs provided at Educational destinations most typically include U-type stands (such as 'M' stands or 'Sheffield' stands) and in some cases, other variations, including 'handlebar racks', which may be appropriate in lower crime risk areas (see CSVVG, Assen case study 2.2.1, for example). Best practice examples of are located in enclosed, controlled access areas, directly covered by on-site guardians and still allow for both wheels and the frame to be locked easily. Parking furniture and their respective enclosure structures are regularly finished in galvanised steel to resist extremes in weather and keep maintenance costs to a minimum.

The monitoring and evaluation plan delivered a methodology for comparative analysis of twenty cycle parking 'corridors' within the CIVITAS area. This was to be undertaken before and after implementation of innovative measures to increase the security of parked cycles, reduce cycle theft and increase cycle use. The methodology provided a structure for a robust evaluation of the impact of the measures, against defined and appropriate performance indicators relevant to security of parked bicycles. Evaluation of the measures identified whether or not they were effective in increasing the security of parked cycles, reducing the incidence of cycle theft and increasing cycle use.

Figure 8: BHCC has improved facilities for cycle parking.

Traffic Speed Reduction Zones - Prevention of Accidents

In Aalborg, 5 speed reduction zones were implemented to decrease speed limits in residential areas. The approach was to establish 4 zones with both signs and physical changes to the road infrastructure and one zone consisting of only signage. The difference in the effects was evaluated.

- Zone 1 was implemented as a 30 km/h speed reduction zone. Signs, bumps and bollards were installed. The pre-existing speed reduction measures (30 km/h bumps and signage) on certain roads were included.
- Zone 2 was implemented as a 40 km/h speed reduction zone with appropriate bumps, signage and bollards. There was one pre-existing bump that was included.
- Zone 3 was established as a 30 km/h speed reduction zone in the western part and 40 km/h in the eastern part. Appropriate bumps were installed in both parts including two pillow bump[1]s, signage and bollards. There were a few pre-existing bumps that were included.
- Zone 4 was an entire speed reduction zone using only signage and a speed reduction of 40 km/h;
- Zone 5 was established as a 40 km/h speed reduction zone. There were a few pre-existing bumps that were included; otherwise, this zone relied only on new signs.

In Donostia - San Sebastián the 30 kilometre zones integrated safety and environmental objectives with traffic in coexistence projects, including the creation of environmental areas and reduced speed limits. However, integration can be problematic in certain urban contexts. The cost and rigidity of the system, together with heavy traffic flows, can make it difficult for coexistence roads to be created. The traditional approach to environmental areas does not solve the problem of traffic speed within them. Speed limit regulations have been seen to be flouted unless changes are made to road characteristics.

In pursuit of more extensive, flexible and cheaper solutions, the implicit integration of pre-existing practices gave rise to the creation of so-called ‘30 areas’ or ‘30 zones’, i.e. roads or areas in which traffic speed was limited to 30 kilometres an hour and where there was a road design reinforcing compliance with this regulation. The entire range of traffic calming options was tested under the

[1] The so-called pillow bumps (“pude bump” in Danish) are constructed in a way that allow buses to pass with up to the signed speed without being seriously affected but still slow down regular car traffic.

designation of '30 km/h zone', from total road redesign with a view to traffic coexistence to installing vertical traffic signs indicating the speed limit.

In Ústí nad Labem, the approach to calming zones was initiated by identification of possible locations for the 'TEMPO 30 zones'. The identification was based on the following criteria:

- Prefer residential areas with housing estates and dense built-up space;
- Prefer areas with schools and medical facilities.
- Avoid restrictions of major roads to ensure the lowest possible impact on traffic flow
- Avoid creating an entrance to a calm zone directly from a busy road due to safety risks and distortion of traffic flow; or when entering a zone from a busy road, to implement increased traffic calming elements by the entrance;
- Avoid calm zones on roads served by PT lines to maintain fluency and speed of PT services;
- Prefer areas with no through routes to discourage any traffic not travelling to or from the specific area.
- Assess the overall nature of the location to preserve its integrity and urban functions and importance.

Selection of suitable locations was based on findings of field surveys, orthographic maps of the city and existing knowledge of the territory. 42 locations were identified as suitable for implementation of calm zones. Before implementation, each proposed zone needed to be examined in terms of traffic intensities, and expected impact of proposed measures, their benefits and costs.

Figure 5: 30 km/h zone in Ústí nad Labem - before and after implementation.

The construction of the shared space near the new Civic Centre in Aalborg was an example of an integration strategy combined with changes in the urban environment so that traffic favoured soft modes. The streets, Østerbro and Kjellerupsgade were rebuilt (approximately 200 m and 40 m in length, respectively). Østerbro is an important commuter route for cyclists who commute between the city centre and the university. Additionally, two bus routes run through the area. The reconstruction of the Østerbro area involved:

- Removal of traffic lights;
- Decreasing the road width to 6.25 m;
- Introducing a speed limit of 30 kph;
- Constructing different kinds of pavement;
- Lightning and street furniture.

Cyclists, cars and busses share the road while the wide pavement for pedestrians serves multiple purposes such as providing link for neighbouring areas and space for recreation. The speed of motorized vehicles was controlled by utilization of speed bumps, signing and the principle of the shared road, meaning that the speed level took account of soft modes. The surrounding environment

was designed to prioritise soft modes. The aim was to reinforce the perception of the area as 'soft', to decrease speed limits and increase vigilance for soft modes.

Traffic Speed Reduction Zones - Control of Infringements

An example of automated control of speed limit infringements came from Donostia - San Sebastián. The city implemented a radar system consisting of speed cameras and cameras for detecting drivers passing traffic lights at red. The radar system is a measure that is unpopular with many drivers, but was considered necessary in different areas of the city as a result of speeding vehicles.

A network of 6 speed cameras was installed in the city, in addition to the one already installed. It was considered the most suitable measure for preventing accidents and accident black spots. All the areas with speed cameras were of a high residential density. There were different social facilities in some of the areas such as older people's homes, children's play parks, study centres or university buildings, and some were traditional areas for strolls where fatal accidents occurred in recent years. The areas were chosen in accordance with the recommendations of the Municipal Police and the residents of the districts themselves.

Resident involvement was of key importance for the installation of the speed cameras. Despite the fact that the speed cameras were a clearly unpopular measure for drivers, the residents actually asked for more of them to be installed. The exact spots where they were installed were where the highest number of speeding offences were recorded.

Figure 6: A test picture from the red light traffic camera in Donostia - San Sebastián.

Another example of control and monitoring of traffic and accidents came from Ústí nad Labem. Here, a safety audit aimed at assessing the current state of traffic infrastructure in Ústí nad Labem and revealing safety deficits. The task consisted of:

- Developing methodology;
- Training personnel;

- Selecting localities with the majority of road accidents;
- On spot inspections of the selected localities in terms of safety deficits, traffic load, potential for accidents and other hazards;
- Measuring traffic speed by static radars;
- Analysing traffic flow characteristics based on measurements;
- Data collection from local school and preschool facilities;
- On spot safety inspections by the local school and preschool facilities;
- Analysing traffic safety situation at school and preschool facilities;
- Proposing actions to improve safety, with assessment of costs and benefits;
- On spot inspections of all major roads in the city;
- Analysing current safety conditions of major local roads, identifying safety deficits and proposing corrective actions.

The approach was based on training the city's employees to be acquainted with a number of aspects: road safety problems, systematic procedures for safety improvements, road safety data collection, assessment of accidents revealing safety deficits and the corresponding legislative background. Training was carried out by a certified auditor and transport experts

Based on records from the municipal police database in Ústí nad Labem, local traffic accidents were analysed. Particular emphasis was laid on the circumstances of accidents and their consequences respecting the protection of sensitive personal data. As a result, critical accident locations were identified.

Specific road profiles were selected for radar measurements of traffic speed and of other characteristics of the traffic flow (number of vehicles and their category). All the collected data were evaluated.

Figure 7: The hardware for monitoring the local traffic in Ústí nad Labem.

Major roads in the city and roads with the majority of road accidents were selected for safety inspections. These were carried out by a floating vehicle, recording videos of each route, encoding

road parameters, tracing the route's location by GPS and detecting safety deficits. Based on the training, city personnel were directly involved in the inspections under the leadership of traffic experts. All data were analysed by the inspection team.

Mobility Improvements for Vulnerable Road Users

In Ústí nad Labem, mobility for disabled and other vulnerable road users with mobility restrictions was increased by improving mobility services and access routes in the city - especially at pedestrian crossings. The approach was to first gather information from the target groups on the specific mobility deficits to direct the initiatives towards the most needed locations. Field studies by researchers in wheelchairs supplemented the survey. Secondly, a web portal of the barrier free routes was established where trails were marked, photos and videos were accessible, and barriers identified.

In Iasi, the approach for increasing the mobility for vulnerable road users was based upon a sustainable public transport strategy and the specific approach was to:

- Install audio warning devices in traffic signals;
- Transform and equip minibuses with lifts and ramps for wheelchairs;
- Install bus stop stations specifically aimed at increasing safety and security for disabled people.

It was expected that these measures would improve social inclusion and mobility for persons with physical disabilities.

Road Safety Campaigns

In Brighton & Hove, the approach to the road safety campaign was initially to undertake research in partnership with the Sussex Safer Road Partnership (SSRP) Data Analysis Team to:

- Identify groups of people in the CIVITAS corridor who were statistically most 'at risk' of being injured in collisions;
- Identify where in the CIVITAS corridor the 'at risk' groups of people were at most risk of being injured in collisions;
- Identify why and how the identified 'at risk' groups were being injured in collisions.

The research identified a number of groups that represented the majority of Killed or Seriously Injured (KSI) casualties in the CIVITAS area (and therefore termed most 'at risk'). These were:

- Pedestrians aged between 10 and 24 years;
- Powered two wheelers (motorcyclists / moped riders);
- Cyclists aged between 20 and 34 years.

'Failed to look properly' was the highest ranking contributory factor to injury in collisions for identified 'at risk' groups.

The road safety campaign measure consisted of:

- Posters;
- Radio feeds;
- Lamp post banners;
- 'Good Code of Practice' leaflets for cyclists.

Figure 9: Posters for the Road Safety Campaign in Brighton and Hove.

In Donostia - San Sebastián, the approach for the road safety campaign was to establish a Citizen Road Safety Pact to improve the safety and security. The Municipality Mobility Department developed a draft text for the Citizen Road Safety Pact. The document has just been presented to the Mobility Advisory Board (MAB), where different organisations and stakeholders regarding mobility are represented. These include the local police, university, business associations, car drivers associations, car park facility companies and political parties. The MAB is the entity in charge of approval and monitoring the Pact's development.

To control negative effects of transport, an Action Plan for Road Safety Improvements in Ústí nad Labem was created. The overall aim was to decrease the number of people killed in traffic accidents in 2010 by half compared to the year 2002. This strategic document defined goals and priorities for transport safety in the city. It also outlined appropriate instruments for such improvements and stressed the need for traffic supervision. Furthermore, the Action Plan assigned responsibilities for individual actions. It consisted of 32 specific objectives ranging across all the elements in this workpackage (safety, security, mobility for vulnerable road users and road safety campaigns). They can be divided into the overarching themes:

- Prevention of accidents;
    - Safety inspections and audits
    - Traffic restrictions
    - Organisation of transport
    - Traffic management
    - Removal of potential accident threats
- Enforcement;
    - Increased law enforcement
    - Focus on respecting vulnerable road users

- Traffic information, education and promotion;
  - Traffic education of youth and children
  - Traffic education of drivers
  - Behaviour principles for pedestrians
  - Behaviour principles for cyclists
- Supervision;
- International and domestic co-operation;
- Financing and resources;
- Time schedule.

As part of the Action Plan, a road safety campaign aimed at decreasing speed levels was conducted. The approach built on experiences from other cities participating in ARCHIMEDES and the chosen methods were:

- Public events in the city;
- Internet information resources;
- Local public media;
- Discussions and presentations;
- Leaflets.

4.3 Problems Encountered & Solutions Attempted

Generally, most of the measures regarding safety and security have been running without any technical problems. The main issues were connected to process related problems.

4.3.1. Technical Issues

No major technical issues have occurred. However, some technical issues were encountered regarding the improved cycling paths as it was difficult to merge a large flow of cyclists with the shared space in limited available space. A further technical challenge was to create acceptable overview conditions for cyclists in areas where kerbstone parking near shops is allowed. The different interests (e.g. servicing shops contra safety for cyclists) need to be considered.

In Donostia - San Sebastián initial plans consisted of radar surveillance of traffic. However, this was supplemented with a red light camera at a pedestrian crossing. Donostia - San Sebastián planned to introduce speed cameras at all selected locations. However, it was soon realised that the use of a red light camera at one specific intersection would be a more appropriate measure for solving the safety problems. Therefore this change in the measure was carried out.

4.3.2. Process Issues

In general, none or only minor problems were experienced in implementation of measures. The measures concerning safety and security demonstrations were aimed at affecting the behaviours of the citizens. However, some initiatives might be unpopular and even dedicated efforts to support a measure sometimes do not suffice. One example is the speed control devices in Donostia - San Sebastián, which were vandalised several times. This issue impacted on the economic development of the measure.

The most common process issues of the measures were minor delays in the construction phases, lack of proper communication to the citizens about the measures, public opposition towards some measures (especially the ones which decreased speed of and space for cars) and low response rate when trying to query about existing problems and get feedback on interventions.

In one case the primary problem in relation to the road safety campaign was that measure implementation ran over schedule. The reason for this was that the suppliers were unable to supply

appropriate material for the cycle lanes, owing to a wider shortage of the product. Another problem experienced was dependence on the availability of match funding from the local authority funds to continue campaigns.

When conducting questionnaires the response rate was in most cases less than 10 percent. Although most respondents were satisfied with measures, some opposed parts of the measures. The implementation of and the satisfaction with the measures could have improved if project officers found more time to meet with residents, and help overcome concerns and objections.

In Brighton & Hove, for example, it was not feasible to locate all Pedal Cycling Parking Places (PCPPs) without taking out car parking places, so parking revenue was affected. However, officers were able to negotiate this by showing the huge benefits that cycling brings to quality of life, health and reducing congestion. The economic value of these balanced the loss of parking revenue.

Regarding the preparation and implementation of the road safety measures and 30 km/h zones, one of the problems faced was that investments are in one sector (i.e. the road sector) whilst savings in another sector (i.e. the health care sector) and in the long run. This means that even though investments from a socio-economic point of view are beneficial, it can be difficult to get the necessary funding as budgeting in sectors are optimised separately.

4.4 Main Outcomes & Results

In general, it was difficult to measure safety impacts over a relatively short period, due to fluctuations in accident rates.

4.4.1 Impacts

Cycle Anti-Theft Scheme

The evaluation focussed predominantly on cycle theft data and cycle parking/locking behaviour. Detailed surveys were conducted at all sites before and after implementation of the measure, to assess levels of informal ('fly') parking, locking behaviour, and numbers of cycles.

The main outcomes were:

- Significant changes in locking behaviour were optimised where observed new stands were installed and were information was provided
- The 'Bike Watch' community engagement initiative was not well received, and response to the awareness and acceptance survey was poor. This 'Bike Watch' initiative would need reviewing and potentially receiving further incentive.

The main results of the Cycle Anti-theft Scheme were that:

- Levels of formal parking (bicycles locked to stands) increased across all sites by 28%;
- 71% increase in good locking practice (using 2 locks) at sites receiving community engagement;
- 91% increase in good locking practice at sites receiving community engagement and new stands.

Traffic Speed Reduction Zones

The evaluations focussed on speed levels, accidents acceptance and awareness. Car counts were also conducted. The main outcomes and results were:

- People were more comfortable letting their children move around in local neighbourhoods after implementation of speed reduction zones. The amount of people who felt uncomfortable with letting their children walk alone in the street, decreased by 10-15 % compared to the before studies.

- For cyclist and car drivers, perceived traffic safety improved due to the new speed reduction zones;
- People felt safer after the implementation of the five speed reduction zones. The experienced safety increased the most in zones where bumps and speed narrowing were implemented.
- A majority of the population supported the implementation of road safety measures, with just a minor share of population clearly against it;
- Speed level measurements show that speed level fell in 70% of the measured places.

Figure 10: City of Aalborg has implemented new innovative initiatives for speed reduction zones such as the flexible bollard and pillow bumps.

Provision for Vulnerable Road Users

The evaluations focussed on the speed level of the vehicles, the amount of cyclists in the affected areas and qualitative surveys of pedestrian and cyclist satisfaction with the areas.

The main outcomes and results were:

- Shared spaces were established. However, the perceived safety was quite low and people felt unsafe due to cars driving at significantly higher speed than soft road users. Further, the barrier free intersections in the shared spaces were problematic for visually impaired people who had difficulties interpreting the traffic and felt discomfort crossing the shared spaces.
- The installation of Audio Warning Devices at intersections was very well received by users, who considered it to be a measure that completely changed their access within public area, increasing their independence and walking safety.
- The average speed level in the shared spaces decreased by approximately 3 km/h and the 85% quantile decreased by approximately 6 km/h.
- In general, most soft road users were satisfied or very satisfied with the shared spaces although they felt uncomfortable cycling in these areas.

The main outcomes and results were that vulnerable road users (e.g. wheel chair users, older people) now can apply a web portal providing information on barrier free routes. Field survey and mapping of existing access routes and related barriers in the city was carried out. Based on the field survey a network of barrier-free routes for people with mobility limitations was pointed out.

Road Safety Campaigns

The main outcomes and results are:

- It is hard to state any reasonable outcome linked directly to campaigns within the short time period for evaluation. However, when promoted among various platforms, when repeated throughout a longer time period and when targeted at specific groups, road campaigns are likely to have a larger impact.
- Awareness of road safety increased due to the execution of road safety campaigns which might, in time, result in reduced accident numbers.

- In one case, road safety inspections across the road network revealed many deficits, some of which were quite serious and posed major safety risks. The emphasis of remedial solutions was placed on improving the safety level and assessing requirements of proposed modifications. Many identified issues can be solved just by proper and regular maintenance.

4.1.2 Changes to Processes

Initially, Ústí nad Labem faced a problem getting access to accident data from the police. This could have prevented traditional black spot analyses and implied a change of focus towards general safety inspections. As the problem with the police was solved, it was in fact possible to pursue both of these approaches.

Both strategies have their advantages and disadvantages. The black-spots in some cases can only be solved through major infrastructural changes. If budgets are limited following the black spot approach may lead to a situation where nothing is done. Safety inspections - if not paired with accident information - may not give the best use of traffic safety investments in the short run. By using both approaches it is possible to develop a larger variety in traffic safety interventions in terms of costs and impacts and thereby create a basis for a continuous progress in traffic safety.

Figure 11: Children practicing traffic safety Ústí nad Labem.

4.5 Future Plans

The established initiatives will continue to exist. The solutions tested and campaigns carried out will be continued as part of the municipal planning for traffic safety. As interventions to improve traffic safety can be quite expensive the current economic crisis and limitations to municipal budgets does put a strain on future plans in this area even though there could be significant benefits achieved in the health & social sectors.

The most prominent future plans are seen within the speed reduction zones, which will continue to exist in the municipalities. However, minor adjustments in the physical road designs are planned, to further increase safety for cyclists and vulnerable road users. There are possibilities in multiple cities of extending the 30 km/h zones to the entire network of residential areas or to entire districts in a city.

The efforts within ARCHIMEDES to seek low cost solutions for 30 km/h zones can therefore become an important contribution to reach traffic safety targets in the coming years.

Figure 12: Mobility Advisory Board Meeting in Donostia - San Sebastián.

5. Conclusions and Recommendations

Workpackage 5 focuses on measures addressing traffic safety and security issues, seeking to minimise accidents and threats, and to address vehicle speed and vandalism. Increasing mobility for soft modes and disabled citizens is also a declared focus for this workpackage.

This section summarises conclusions and recommendations regarding the various technologies within this workpackage. More detailed information regarding the different measures can be found in D10.3 Final Evaluation Report and D12.4 Final version of measure level result templates.

5.1 Conclusions

A basis for real collaborative success is “Transport Safety Action Plan” or “Civic Road Safety Pact”, which should be a treaty between politicians, drivers and other citizens to keep safety as the priority task. The common visions generated in collaboration between a city's various stakeholders are important to gain consensus and a united approach towards transport and road safety.

A measure which is regarded to hold high potential for increasing transport safety is the speed reduction zones. Most commonly, they are being implemented in residential areas as 30 km/h zones, with speed reduction measures such as road narrowing and bumps.

The experiences regarding Cycle Anti-Theft Scheme are, that levels of formal parking (bicycles locked to stands) increased by 25-30 % as a result of better parking facilities and campaigns on good locking

practice (using 2 locks). When residents are receiving both community engagement and new stands, it was possible to attain a 90 % increase in good locking practice.

The experiences regarding Traffic Speed Reduction Zones are that people are more comfortable with letting their children move around in local neighbourhoods after implementation of speed reduction zones and that people experience a higher road safety after the implementation of the speed reduction zones. The traffic speed reduction zones have resulted in lower speed levels on approximately 70 % of the measured stretches and the most significant decreases occur in areas where both signage and physical changes in the infrastructure were applied. The perceived safety in the 30 km/h zones was significantly higher than before, even when taking into account that perceived safety was initially high. However, a communication effort is required for increasing the acceptance of the 30 km/h zones.

Finally, it can be concluded that as an instrument of speed surveillance the radar systems are most suitable for main arterial streets. These are where traffic speeds are high and fast and significant reductions can be pursued.

The experiences regarding provision for vulnerable road users were that average vehicular speed decreases as roads are shared by a broad variety of road users. However, it can be concluded that this mixed use and speed variations can make many soft users of shared spaces feel unsafe. However, these users are likely to be more aware of other road users and the number of traffic accidents might decrease when analysing them over a longer time perspective.

Urban public transport is actually the safest motorised mode. However, its popularity and attractiveness are limited by (perceived) security when accessing stops and during travel, especially at off-peak times.

The Audio Warning Devices are very well received by users. It completely changed their access within public areas, increasing their independence and walking safety. However, visually impaired people can have difficulty moving around in barrier-free shared spaces with no formal intersections. Hence, improvements to help people with limited mobility should include adjustments of public spaces, pedestrian sidewalks, trails, and crossings and especially all PT stations e.g. by lowering kerbs, using tactile road markings, ensure free passage between lamp posts, signs etc.

The experiences regarding Road Safety Campaigns are that they are relatively cheap measures for increasing road safety. It can be concluded that the costs of launching, maintaining and repeating the campaign are minor compared to the savings when traffic accidents are avoided. Further, the greatest effect of a road safety campaign is reached when combining several different platforms (e.g. advertisements on TV, radio and in the urban environment) and when targeting a purpose, (e.g. a specific group of road users, specific types of accidents or a specific area or stretch). Finally, it is crucial to elaborate and pursue a strategic city document to set specific actions for road safety improvements. This should involve key stakeholders regarding sustainable mobility.

5.1.1. Recommendations

It is notable an individual's modal choice is influenced by safety and security, not only accessibility and price. Safety and security are important aspects for sustainability of non-motorised modes such as walking and cycling.

Taking steps to reduce the negative safety effects of individual motor transport on the city environment supports sustainability and balanced modal split. Balanced transport safety policy should start from monitoring the baseline situation, through implementation of action plans, including education, control, penalisation, preventive and reactive actions, based on safety audits and inspections of accident black

spots. The measures regarding safety and security can easily be adopted by other cities although it requires that necessary public funding is available.

All actions have to be primarily concentrated on saving lives and minimising the number of accidents in daily traffic. An important condition is to minimise conflict points between motorised and non-motorised traffic, where speed is generally limited to 50 km/h in cities and where there is a high concentration of vulnerable road users.

Therefore actions should be focused on education of children and older people, young cyclists and improved conditions for disabled people. Speed control, traffic management and surveillance, prevention of drunk driving, use of seatbelts and helmets, use of lights and reflectors, pedestrian crossings and good access to PT stops are topics that should be part of an overall safety strategy for cities. Focus should be on improving conditions for pedestrians (especially children) and cyclists, by improving infrastructure and road side equipment, or by traffic calming and eliminating conflicts between motorised and non-motorised transport.

In measures where the aim is to reduce speed, it is recommended to apply simple and relatively cheap initiatives like signage, and information and education campaigns, as well as investments in physical infrastructure. The latter might include rebuilding of roads into shared spaces, narrowing roads and construction of cycle paths.

There should be clear distinguishing between *experienced* traffic safety/speed levels and *actual* traffic safety/speed levels. Experience can be affected by the level of awareness. It is recommended to measure actual traffic safety and speed levels. It is important that traffic safety in cities is measured and judged objectively using road accident data, with records of location, reason, conditions, number of minor and serious injuries, and deaths.

Finally, it is recommended to establish meetings with a broad range of organisations, citizens, politicians and other stakeholders, to take account of various viewpoints and ensure a unified approach. Dialogue is needed in defining priorities, planning and taking technical decisions. Problems can occur due to the different character interests of the involved stakeholders. One group who most certainly will oppose restrictions for cars is car drivers. Hence, it is recommended to initiate a dialogue to reveal the position of the drivers in the relevant area, to know if there will be a strong opposition, and to prevent misconceptions from causing unnecessary problems. It should be noted that most measures require good cooperation with the police.