

Measure title: **Safe districts and 30km-zone + Road safety measures**

City: **Donostia–San Sebastián** *Project:* **ARCHIMEDES** *Measure number:* **46 + 47**

Executive Summary

Although different in scope, both measure DSS 46 (safe districts and 30-km-zones) and measure DSS 47 (road safety measures) are directed towards the same goal: increase road safety and reduce the number of traffic accidents. Measure DSS 46 implements the concept of “30km-zones” and focuses on achieving a change in driver’s behaviour, both by introducing physical elements to prevent high traffic speeds and by developing awareness campaigns. New driving patterns are expected to influence non-motorized mobility, reducing the perceived risk, especially by cyclists who share the road with motorized traffic, thus promoting its use. While measure DSS 47 focuses on making effective that speed limitations are observed by drivers by introducing radar systems to control, enforce and sanction against high speeds.

To evaluate the impact of these measures implemented within CIVITAS, a twofold approach has been followed. On the one hand, the perception of citizens about the changes in the infrastructure and the perceived risk in these areas has been assessed (do they feel safer? do they accept these changes as a positive aspect in these areas?). On the other hand, actual performance data has been analysed (have these measures had any influence in the number of accidents, injuries or dead people?).

Although awareness of the measures is not very high (nearly 40% of the population), a big majority of the population supports its implementation (72% regarding 30-km-zones and 65% regarding radar systems), with just a minimum share of population clearly against it (less than 1%). Accordingly, population’s perceived security has increased after the implementation of the measure, even when this perception was already high before the CIVITAS project started (from 6.1 out of 10 before the measure was implemented, to 6.7 after its implementation). The perception of security has also increased among bicycle users, being this one of the measure objectives (before the implementation a 68% believed that the city was safe for cyclists, while after the implementation this proportion has reached 70%).

Both approaches have revealed effectiveness towards the overall objectives of the measures, i.e. the reduction in the number of deaths and injured people caused by traffic accidents and the decrease in average traffic speeds. Speed reductions have been achieved in all cases, being more significant in absolute terms those corresponding to the radar systems (11km/h reduction in average speed during peak hours) than in areas 30 km/h (8 to 3 km/h during peak hours depending on the area of implementation).

Also, significant reductions in the number of deaths and injured people have been accounted in all neighbourhoods, ranging from a 14% reduction in the radar system affected area to an 11%, 7% and 1% respectively in the three implemented 30km/h zones.

Moreover, results from the evaluation have confirmed the suitability of each approach to their corresponding context: while 30 km/h-zones have provided further improvements in residential areas where traffic speeds were already low; radar systems are more suitable for main arterial streets where traffic speeds are high and fast and significant reductions are achieved.

During the implementation of the measures, two issues have revealed as essential for success:

- On the one hand, an on-going dialogue with all civic associations during the preparation and implementation phases in order to build consensus regarding the required approach to road safety, developed in the framework of a Citizen Road Safety Pact
- Gain support from key target users through on-going communication efforts, such as residents, pedestrians and cyclists, who can act as an important drivers in the development of the measure.

A Introduction

Although different in scope, both measure DSS 46 (safe districts and 30 km-zones) and measure DSS 47 (road safety measures) are directed towards the same goal: increase road safety and reduce the number of traffic accidents. Moreover, when impact evaluation is concerned, both measures use the same indicators panel and the methods for its calculation reveal significant commonalities.

Therefore, it is considered that a joint evaluation report will allow establishing a comparison between the two approaches followed towards the shared objective that could be useful for the purposes of drafting recommendations and knowledge transference.

The main difference between these two measures relies in the process followed for its implementation. While measure DSS 46 is based upon citizen's communication and awareness raising regarding a measure proposed by the Municipality, measure DSS 47 focuses on stakeholder's involvement and consensus among concerned parties in order to identify the more suitable measures. The particularities of these approaches will be described in section D of this report.

A1 Objectives and target groups

A1.1 Objectives

The combined objectives of measures DSS 46 and DSS 47 can be expressed as follows:

(A) High level / longer term:

- To achieve a reduction in the number of traffic accidents by reducing the number of fatal accidents and serious injuries
- To achieve a reduction in the perceived accident risk by all means of transport (particularly non-motorized)

(B) Strategic level:

- To establish a Road Safety Pact with all relevant stakeholders as a tool to define and promote the implementation of road safety measures
- The implementation of 'safe districts' by means of the 30-km-zone concept
- To raise awareness about the need to moderate traffic speeds in the inner city

(C) Measure level:

- (1) Design three 30-km-zones in the CIVITAS corridor
- (2) Installation of radar systems in at least three locations to control, enforce and sanction against high speed
- (3) Implementation of changes at 50 crossings to increase safety for cyclists and pedestrians
- (4) Conduct an awareness raising campaigns on road safety and speed control issues

- (5) Reduce the number of fatal accidents and serious injuries by 50% compared to the 2002 figures

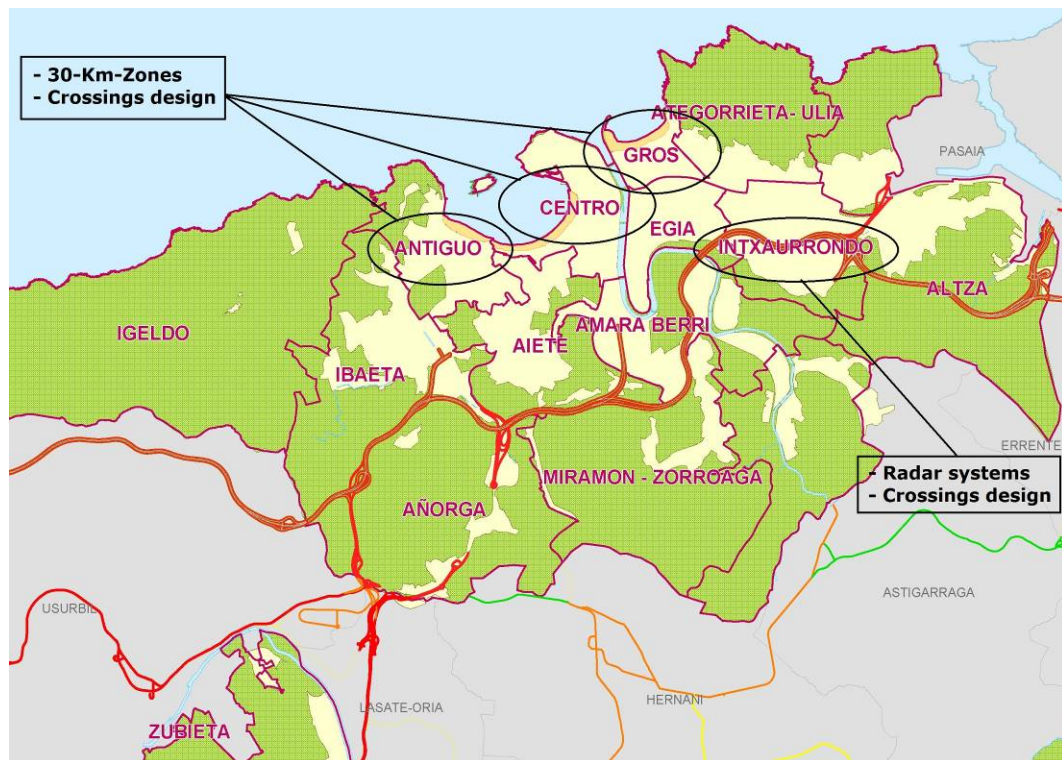
A1.2 Target groups

Although the benefits from these measures will mostly rely on the residents of the concerned areas (safe districts), it is expected that its effects will be extended to the whole population, including the people living in the region (Donostialdea) and visitors, since the measures are implemented in the city centre area, where multiple services are located, thus attracting travellers from other areas of the city too.

As for the Road Safety Pact, the target groups include civic and economic associations, car driver’s associations, cyclists, motorists, disabled people and the elderly.

A2 Description

The following map indicates where the different type of measures has been implemented:



Picture 1: Location of 30-km-zones and radar systems

Measure DSS 46: safe districts and 30-km-zones

Measure DSS 46 implements the concept of “safe district” and “30-km-zones” in order to increase road safety by means of a reduction in the average speed of motorised vehicles and providing safe crossing points for pedestrians and cyclists. The aim is to promote new driving patterns among car users through design elements in the affected districts. In addition, new driving patterns are expected to influence non-motorized mobility, reducing the perceived risk, especially by cyclists who share the road with motorized traffic, thus promoting its use.

It is an innovative measure that takes advantage of the opportunity made available by recent changes to Spanish law regarding 30-km-zones.

It is estimated that around 50.000 inhabitants will benefit from the introduction of the safe district and 30-km-zones concept in three different areas of the city. Moreover, the city Mobility department, ADS, in collaboration with Public Works Dept. has undertaken interventions at 50 crossings to increase safety for cyclists and pedestrians.

Antiguo

Centro

Gros



Picture 2: Affected neighbourhoods

The project did not fund the infrastructural changes but did support its implementation by:

- Design of the 30-kilometre zones and the interventions for speed reduction
- Design of interventions at crossings to improve safety for cyclists and pedestrians
- Information campaigns directed at car drivers and inhabitants.

Measure DSS 47: road safety measures

Within measure DSS 47, ADS has established a Road Safety Pact with all relevant stakeholders as a tool to define and promote the implementation of road safety measures. The reference for the work of the Road Safety Pact were the priorities identified within the Road Safety Plan. Its objective was to increase the number of actions directed at road safety, while sharing the management and monitoring with civic associations that have a responsibility for mobility.

Specific measures include: awareness-raising campaigns; post-accident attention services; observatory for monitoring progress, co-ordinating traffic safety data from all stakeholders.

As a first step, measure DSS 47 implemented radar systems in at least three locations to control, enforce and sanction against high speed.

B Measure implementation

B1 Innovative aspects

The innovative aspects of these measures are:

- **New conceptual approach** (at national level). Measures include the citizen's participation to identify conflicts between modes and its solutions.
- **New organisational arrangements or relationships** – The Road Safety Pact implies an innovative organisational approach where all relevant stakeholders are involved in the promotion of road safety measures.
- **New physical infrastructure solutions** (at national level). The measure has introduced an innovative approach to traffic calming.
- **Use of new technology/ITS** - The installation of radar systems to control, enforce and sanction against high speeds includes the use of new technologies regarding data management and transmission.

B2 Research and Technology Development

The implementation of measures DSS 46 and DSS 47 included the development of a specific research as a preparatory phase: Task 11.5.2. Road safety studies (September 2008 – March 2010):

Within this task, the Mobility Dpt. of the city of Donostia-San Sebastian undertook a review of best practice regarding:

- Safe districts and 30 kilometre zones;
- Road safety pacts
- Installation and operation of radar systems.

The studies also defined the appropriate monitoring scheme, providing input to the site-level evaluation plan to ensure maximum transferability of results.

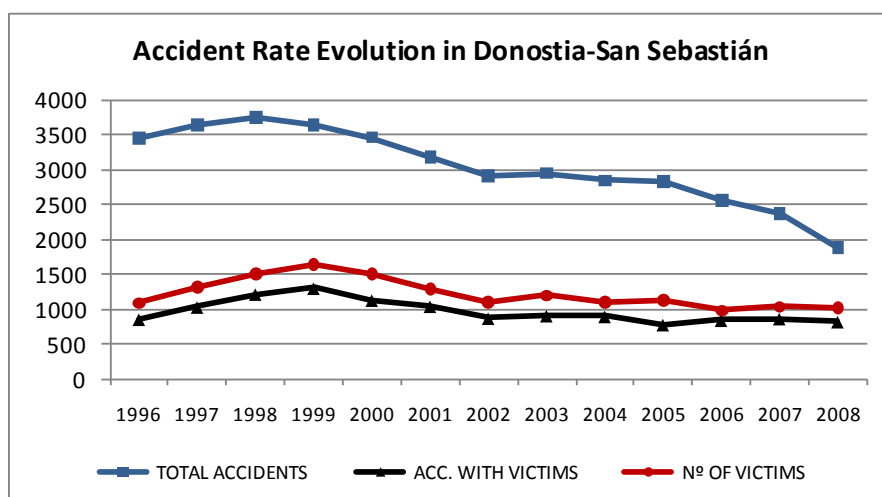
The results of these specific researches were used in the definition of the implementation strategy of both measures.

B3 Situation before CIVITAS

Before the CIVITAS project started, the city of Donostia-San Sebastian already had a Road Safety Plan but until then actions have only been implemented in a limited number of areas at a low pattern (e.g. Aiete, Intxaurreondo,). There was a need to foster the implementation of road safety measures according to the priorities identified by the Road Safety Plan.

As for the specific condition of traffic and its impact on road safety, before CIVITAS all urban areas were regulated by 50 km/h speed limits.

The following graph shows the evolution in accident rates in Donostia-San Sebastian:



Picture 3: Accident rate evolution in Donostia-San Sebastian

It can be seen how the number of victims is decreasing at a lower pattern than the number of accidents, while there was not a significant increase in occupancy ratios during the same period, which point out at speed as possible reason for this finding.

A close look to the accident rates of pedestrians reveals the severe impact of traffic speed over these users:

YEARS	TOTAL Nº OF VICTIMS	TOTAL Nº OF DEATHS	PEDESTRIAN VICTIMS	% PEDESTRIAN VICTIMS WITH RESPECT TO TOTAL VICTIMS	PEDESTRIANS KILLED	% PEDESTRIANS KILLED OVER TOTAL DEATHS
1996	1086	8	186	17%	4	50%
1997	1323	10	186	14%	7	70%
1998	1507	11	192	13%	5	45%
1999	1631	14	244	15%	8	57%
2000	1504	14	244	16%	7	50%
2001	1285	5	203	16%	1	20%
2002	1092	8	163	15%	3	38%
2003	1195	11	192	16%	6	55%
2004	1098	7	174	16%	4	57%
2005	1124	2	129	11%	0	0%
2006	976	5	122	13%	2	40%
2007	1032	7	108	10%	3	43%
2008	1011	2	86	9%	0	0%
TOTAL	15864	104	2229	14%	50	48%

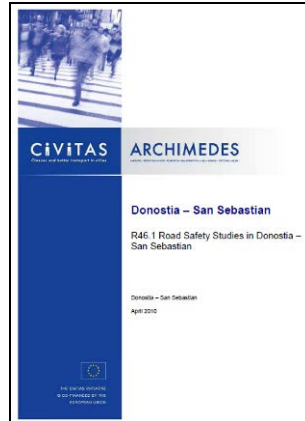
Table 1: Accident rates of pedestrians

While the number of pedestrian victims remains relatively low as compared with the overall number of casualties, the proportion of pedestrians among the mortal victims is very high.

B4 Actual implementation of the measure

The measure DSS46 has been implemented according to the following stages:

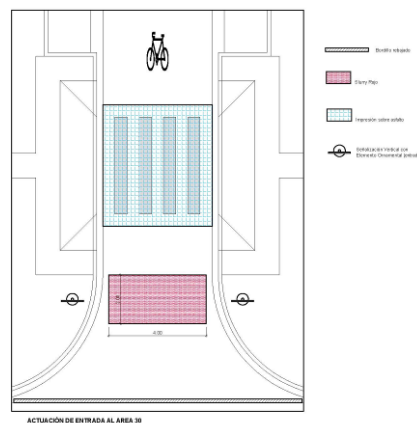
- **Stage 1: Planning and design phase.** (September 2008 – March 2010) - Selection of the areas which are suitable for the introduction of the 'safe districts' an 30 kilometre zone concept



Picture 4: Research study on 30-km-zones

The neighbourhoods of Antiguo, Centro and Gros were selected due to the combination of its location in the city centre and the blend of high residential population and multiple services and tourist attractions, which highlights these areas as very important attraction nodes with high rates of pedestrian mobility in them.

- **Stage 2: Project design of the 30-kilometre-zones:** (March 2010 - September 2010) - including the interventions for speed reduction and the crossings to improve safety for cyclists and pedestrians.



Picture 5: Project design of 30-km-zone

- **Stage 3. Information campaigns:** (September 2010 – December 2010) - directed at car drivers and inhabitants about the interventions



Picture 6: 30-km-zones promotion campaign

- **Stage 4: Implementation of 30 kilometre-zones in the selected areas** (September 2010 – December 2010) - including traffic calming interventions at crossings

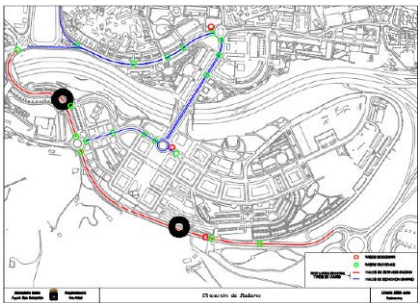


Picture 7: 30-km-zone in Donostia-San Sebastian

- **Stage 5: Monitoring and evaluation** (March 2010 – May 2012)

As for the measure DSS 47, it has been implemented according to the following stages:

- **Stage 1: Selection of suitable areas for the introduction of ‘safe districts’** (September 2008-June 2009).



Picture 8: Research study on radar systems

An analysis of available accident data was made to decide where to install the radar systems. The decision was made in combination with early contacted civic associations.

- **Stage 2: Speed control radar systems introduction.** (June 2009 – September 2009)



Picture 9: Radar system captured image

Resulting from the preparation phase, it was decided that instead of three pure speed control radars, two radars would be used in combination with one red light camera systems. Also, based on the dissuasive effect proved by radar systems in other locations, it was decided to use the two speed control radar in combination with five radar cabinets. The radar systems operate on a rotator basis: three radar cabinets remain empty and two fully operative, without car drivers knowing where the radars are actually operating. This pattern changed over time.

In addition, an information campaign directed at car drivers and inhabitants about the security measures implemented was developed.

- **Stage 3: Citizen Road Safety Pact** (June 2009 – March 2010)



Picture 10: Citizen Road Safety Pact meeting

Civic associations and stakeholders are working together to design the measures to be implemented using the Road Safety Plan as a reference. This has resulted in a Road safety Pact signed by all parties.

- **Stage 4: Monitoring and evaluation** (March 2010 – May 2012)

B5 Inter-relationships with other measures

As already explained in the introduction, there is a strong relation between measures DSS 46 and DSS 47. These measures are also related to the development of the cycling network in measure DSS 24, since the implementation of 30-km-zones provide continuity to the bicycle lanes connecting neighbourhoods by guaranteeing safe and comfort conditions for cyclist while sharing streets with motorized traffic.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

Measures DSS 46 and DSS 47 comprise a package of measures aimed at reducing the number of casualties caused by traffic, as well as protecting vulnerable groups (pedestrians and cyclists) from their consequences. To do so, measure 46 focused on achieving a change in driver's behaviour, both by introducing physical elements to prevent high traffic speeds and by developing awareness campaigns; while measure 47 focused on making effective that speed limitations are observed by drivers by introducing radar systems to control, enforce and sanction against high speeds. Stakeholders were involved in the achievement of this behavioural change by means of a Citizens Road Safety Pact.

The risk associated to walk or cycle (either real or perceived) is one of the main factors deterring people to use these modes for their daily mobility. These measures, in addition to a reduction in the number of injuries and deaths caused by accidents, has foster the use of non motorized modes, contributing to the overall goal of reducing the number of private cars entering the city and circulating within its neighbourhoods. Moreover, the implementation of 30-km-zones is considered an integral part of the cycling strategy in Donostia-San Sebastian, providing continuity to the bicycle lanes connecting neighbourhoods by guaranteeing safe and comfort conditions for cyclist while sharing streets with motorized traffic.

Both speed reduction and modal shift to non-motorized modes have helped improved traffic performance, alleviating congestion in Donostia-San Sebastian streets, thus favouring time saving for motorized modes, and improving public transport reliability, which, in addition to improved access to bus stops, contribute to increase the public perception of this mode, and therefore its use. As a result, benefits in the form of improved air quality, reduced carbon emissions, decreased noise levels, and a better health for the citizens are achieved.

In addition the implementation of 30-km-zones may have resulted in a limited number of car users changing their usual route through the affected neighbourhoods to avoid slow streets. This is considered a positive effect, since it would only affect passing-through traffic, while the areas of the city where 30-km-zones are implemented are considered local access traffic areas.

Nevertheless, the impact evaluation of this measure focuses on the safety and security effects, since this is the main goal of the measure, and traffic performance and environmental impacts are derived effects which are achieved in combination with other CIVITAS measures.

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C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
SOCIETY						
13		Acceptance	Awareness	Awareness level	Awareness of the policies/measures	Index (%), qualitative, collected, survey
14			Acceptance	Acceptance level	Attitude survey of current acceptance of the measure	Index (%), qualitative, collected, survey
17			Security	Security	Perception of security	Perception of security when using service
TRANSPORT						
20		Safety	Transport Safety	Injuries and deaths caused by transport accidents	Number of accidents, fatalities and casualties caused by transport accidents	No, Quantitative, measurement
23		Transport System	Congestion Levels	Average vehicle speed - peak	Average vehicle speed over total network	Km/hr, quantitative, derived
24				Average vehicle speed - off peak	Average vehicle speed over total network	Km/hr, quantitative, derived

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
13	Awareness level	Increase awareness of the measures directed towards traffic safety issues, especially for pedestrians and cyclists.	Data has been collected through a specific before and after survey over a representative sample of citizens living in neighbourhoods affected by this measure. The target audience is citizens of all ages and gender living in or visiting the neighbourhoods where security measures are implemented. The survey method consisted of on-street personal interviews to randomly selected individuals. The questionnaire included questions regarding awareness, acceptance and perception of security levels. A sample size of nearly 400 interviews was used (95% confidence level).	2 times (before and after the implementation of the measure)
14	Acceptance level	Increase acceptance of the measures directed towards traffic safety issues, especially for pedestrians and cyclists.	Data has been collected through a specific before and after survey over a representative sample of citizens living in neighbourhoods affected by this measure. The target audience is citizens of all ages and gender living in or visiting the neighbourhoods where security measures are implemented. The survey method consisted of on-street personal interviews to randomly selected individuals. The questionnaire included questions regarding awareness, acceptance and perception of security levels. A sample size of nearly 400 interviews was used (95% confidence level).	2 times (before and after the implementation of the measure)
17	Perception of security	Increase the perception of security, especially for pedestrians and cyclists.	Data has been collected through a specific before and after survey over a representative sample of citizens living in neighbourhoods affected by this measure. The target audience is citizens of all ages and gender living in or visiting the neighbourhoods where security measures are implemented. The survey method consisted of on-street personal interviews to randomly selected individuals. The questionnaire included questions regarding awareness, acceptance and perception of security levels. A sample size of nearly 400 interviews was used (95% confidence level).	2 times (before and after the implementation of the measure)
20	Injuries and deaths caused by transport accidents	To reduce the number of casualties as a result of roadside accidents.	Police records on accidents have been analysed before and after the implementation of the measures.	2-3 times (before and after the implementation of the measure)
23	Average vehicle speed - peak	To reduce the speed peak and respect the speed limits.	Speed levels have been registered at selected stretches before and after the implementation of the measure. In the 30-km-zones electromagnetic loops have been used for that purpose, while radar systems were used where appropriated.	2-3 times (before and after the implementation of the measure)
24	Average vehicle speed - off peak	To reduce the speed peak and respect the speed limits.	Speed levels have been registered at selected stretches before and after the implementation of the measure. In the 30-km-zones electromagnetic loops have been used for that purpose, while radar systems were used where appropriated.	2-3 times (before and after the implementation of the measure)

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C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Focus groups/ questionnaires	13-14-17	Month 21 / Month 33	ADS – Andrés Martínez
Accidents analysis	20	Month 15/ Month 27/ Month 39	ADS – Andrés Martínez
Speed level registration	23-24	Month 21/ Month 32/ Month 39	ADS – Andrés Martínez

C1.2 Establishing a baseline

In Donostia-San Sebastián some small-scale attempts of traffic calming have been carried out during the last years. But little dissemination was made about it which combined with the small-scale of the initiatives, resulted in a very limited impact.

But the Sustainable Mobility Plan of the city of San Sebastián points out that traffic calming measures are required in order to increase security of citizens and to reduce number of accidents. The CIVITAS-ARCHIMEDES project has served as a driver for the implementation of this kind of measures.

Evaluation approach

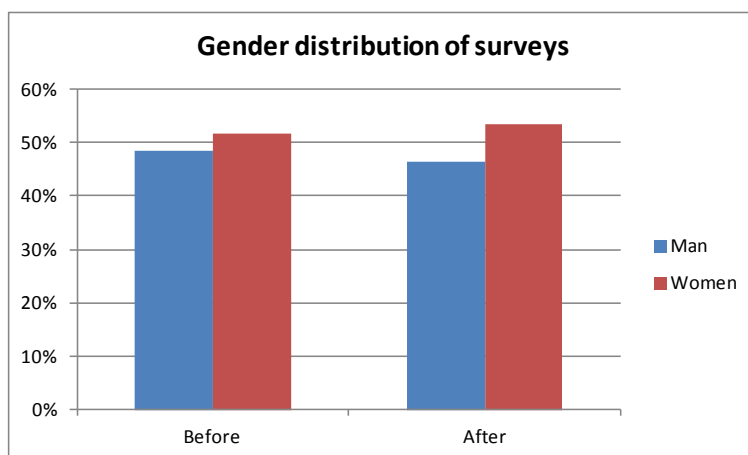
To evaluate the impact of the traffic safety measures implemented within CIVITAS a twofold approach has been followed. On the one hand, the perception of citizens about the changes in the infrastructure and the perceived risk in these areas has been assessed (do they feel safer? do they accept these changes as a positive aspect in these areas?). On the other hand, actual performance data has been analysed (have these measures had any influence in the number of accidents, injuries or dead people?).

The first group of indicators was gathered through two on-street surveys in the neighbourhoods affected by the measure. The sample size was calculated with a 95% confidence level and a 5% margin of error over the population of Donostia-San Sebastián. In the following chart we can see how the enquiries were distributed within the affected neighbourhoods:

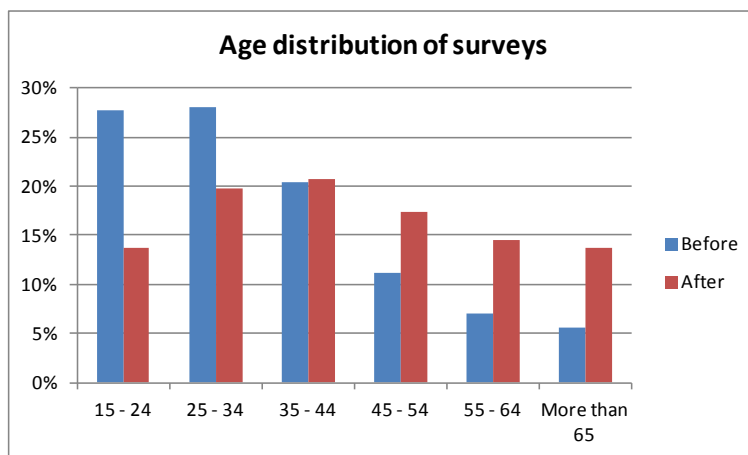
DISTRITS TO SURVEY	ANTIGUO	CENTRO	GROS	INTXAURRONDO	TOTAL
Population	17.411	14.200	20.396	17.155	69.161
% Population	25,17%	20,53%	29,49%	24,80%	100%
N° Survey	96	79	113	95	383

Table 2: Surveys distribution

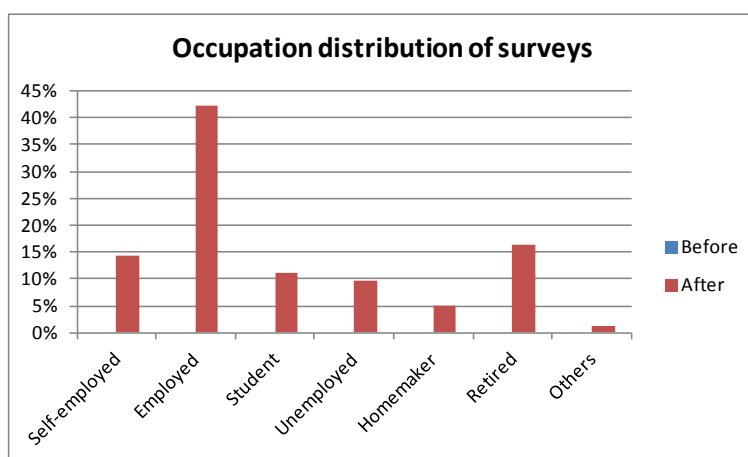
A representative sample of citizens of all ages and gender living in or visiting the neighbourhoods where security measures are implemented were randomly selected for on-street personal interviews. The questionnaire included questions regarding awareness, acceptance and perception of security levels (see questionnaire annexed to this report, Annex 1).



Picture 11: Gender distribution of surveys



Picture 12: Age distribution of surveys



Picture 13: Occupation distribution of surveys^(*)

(*) A coding error made impossible to assess occupation distribution on the “Before” survey

For the second group of indicators data provided by the local police (department responsible for this matter) regarding accidents has been used.

Also, speed levels have been registered at selected stretches before and after the implementation of the measure. In the 30-km-zones electromagnetic loops have been used for that purpose, while radar systems were used where appropriated.

Radar systems undertake a continuous measurement of traffic speeds along the stretches where they are implemented. In this case, average values corresponding to the radar system implemented in one of the main axis, Paseo de Otxoki, are used.

On the other hand, to assess speed levels in the neighbourhoods affected by 30-km-zones, both before and after its implementation, *ad hoc* speed measurements have been made. The main collector street in each case has been selected for a two round of 24h speed measurement (using a double loop detector), assuming that speed levels in the adjacent local access streets would be below the measured ones. Details of the streets selected and measurement dates are as follows:

Neighbourhood	Street	Measurement dates
Antiguo	Avenida de Zarautz	7-9 Jun 2010 3-6 Jun 2011 19-26 Jan 2012

Centro	Calle Fuenterrabía	2-4 Jun 2010 2-6 Jun 2011 1-13 Dec 2011
Gros	Calle Segundo Izpizua	15-18 Jun 2010 17-24 May 2011 09-23 Nov 2011

Table 3: 30-km-zone speed measurements

Area considered

As already referred in the measure description above, the neighbourhoods affected by these measures are Centro, Antiguo and Gros (30-km-zones) and Intxaurreondo (radar systems).

Time scale

All the main works for the safety measures in the area of Intxaurreondo were finished at the end of 2009, beginning of 2010. Therefore the “Before” data is calculated in the beginning of year 2009. On the other hand, the 30-km-zones in the districts of Antiguo, Centro and Gros were implemented in the last months of year 2010. Consequently, the “Before” data corresponds to the beginning of the year 2010 in these areas.

The before and after surveys to gauge ‘social’ indicators were undertaken during the first semester of 2010 and 2011, respectively. Beginning of 2010 is considered a good base-year situation as the actions taken in Intxaurreondo were just finished and the changes by citizens were not already noticed, while 30-km-zones were not yet implemented at that time.

C1.3 Building the Business-as-Usual scenario

If these measures would have not been implemented, actions foreseen in the Road Safety Plan would have been implemented through a slower pattern, limiting the effectiveness of it. Therefore traffic speed in certain areas of the city would remain too high. As a consequence, injuries and deaths caused by traffic would remain as a significant problem in the city.

For evaluation purposes, the BaU scenario has been built assuming that injuries and deaths evolution would follow last years’ trend in terms of number and severity. There are records on deaths and injured people in the corresponding neighbourhoods since 2002. According to these records, yearly rates have been calculated in order to determine the variation that the number of deaths and injured people would have experienced in case the measure would not have been implemented. Results are as follow:

City Area	Yearly variation on deaths and injured people
Gros	-0,9%
Antiguo	+3,3%
Centro	+1,7%
Intxaurreondo	-2,5%

Table 4: BaU estimation for deaths and injured people

Regarding traffic speeds, before the CIVITAS project there was not a regular monitoring program regarding average vehicle speed at residential streets. Therefore, it is not possible to undertake a BaU estimation in this matter, due to the lack of historical data (within ARCHIMEDES, only one single “Before” measurement has been undertaken).

Also, if these measures would have not been implemented, road traffic would remain as a physical and psychological barrier for cycling and walking, contributing to the consolidation of a motorized mobility model in Donostia-San Sebastian, resulting in increased transport related emissions and impacts. This issue is assessed through the ‘Perception of Security’

indicator. Nevertheless, as for the BaU scenario, it is not possible to make estimations in this matter, since there was not a regular survey program regarding road safety perception in the past, lacking of reference data.

C2 Measure results

C2.1 Society

The following table shows the results of the Acceptance indicators:

Table C2.1.1: Acceptance

Indicator	Before (1 st semester 2010)	BaU (date)	After (1 st semester 2011)	Difference: After – Before	Difference: After – BaU
13. Awareness level	43,24%	N/A	36.88%	-6.36%	N/A
14. Acceptance level (30-km-zones)	79,19%	N/A	71.95%	-7.24%	N/A
14. Acceptance level (radar systems)	46,22%	N/A	64.94%	18.72%	N/A

Early in 2010 there was a 43% of the population aware of the measures foreseen by the municipality in terms of road safety. A share of 24% of this aware population believed they were right, while 19% believed they were insufficient. Only 0,3% of the aware population declared that they were wrong.

Surprisingly, after the implementation of the measure, the share of population aware of the measures has decreased (37%). Most probably, the explanation for this result is that a big share of the surveyed people regarded the question as for additional future plans, instead of the recently implemented measures. Like in 2010, a majority of the population regard the measures as positive. In particular, among these aware citizens, in 2011, a share of 19% considered that the measures implemented were appropriate, while a 17% considered them as insufficient. A 0,7% believed that the measures were wrong.

As for the acceptance level, a big majority of the population still believes that 30-km-zones contribute to increase traffic safety in Donostia-San Sebastián (72% of the surveyed people), although this perception has slightly decreased as compared to the high expectations before the measure was implemented (79% in early 2010).

On the contrary, the implementation of radar systems was not widely accepted before its implementation (only a 46% of the population believed that it would contribute to increase traffic safety in Donostia-San Sebastián), but after a year in operation its acceptance level has increased, reaching a 65% of the population in favour of the measure.

These figures are in concordance with the results of a wider question in which the population was asked if reduced traffic speeds will contribute to traffic safety. In 2010 nearly all the population agreed with this statement (94%) with just a small proportion of population against this idea (2%). After a year in operation, in 2011, a significant majority of the surveyed people still believes that reduced speeds contribute to an increased traffic safety (73% of respondents), while 23% of the population is sceptical about the results of the measure.

Results for the Security indicator are as follows:

Table C2.1.2: Security

Indicator	Before (1 st semester 2010)	BaU (date)	After (1 st semester 2011)	Difference: After – Before	Difference: After – BaU
17. Perception of security	6,10	N/A	6,62	0,52	N/A

The “before and after” survey has revealed a slight increase in the perception of security of Donostia-San Sebastián's population. In early 2010, the population rated traffic safety in Donostia-San Sebastián as good, with a score of 6,10. After a year since the measures were implemented, the perception is slightly better, with a score of 6,6.

To complement this figure, people were asked whether they believe the city is safe for car drivers, cyclist and pedestrians, respectively. In all cases the perception of security is significantly high. According to citizen's response, Donostia-San Sebastian is safer for pedestrians (88% answered that in the city is safe to walk) than for car users (70%), while the less safe mode is the bicycle (67%). In 2011 survey, results reflected an increased perception of security associated to drivers (83%), while the perception of security associated to pedestrians has decreased as compared to 2010 (74,5%). Finally, cycling is still perceived as the less safe mode of transport in Donostia – San Sebastian (69,6%), although this feeling has increased as compared with the situation before the implementation of the measures.

C2.2 Transport

In the following table results of the Safety indicators are shown. Results from measure 46 and 47 are presented separately:

Table C2.2.1: Safety

Indicator	Before (2010)	BaU (2011)	After (2011)	Difference: After – Before	Difference: After – BaU
20. Injuries and deaths caused by transport accidents (Gros)	98	97	97	-1	0
20. Injuries and deaths caused by transport accidents (Antiguo)	74	76	66	-8	-10
20. Injuries and deaths caused by transport accidents (Centro)	168	171	156	-12	-15

Results in the areas were 30-km.-zones were implemented reveal a significant increase in traffic safety. Important reductions in the number of traffic casualties have been experimented in the neighbourhoods of Antiguo and Centro (10,8% and 7,1% respectively, as compared to the year before the measure was implemented). Considering the evolution in the number of deaths and injured peoples experience during the last years, the increase is even higher (13,1% and 8,8 respectively, as compared to the BaU scenario). There is also a reduction in the Gros neighbourhood (1%) but not as important as in the other two areas. It should be borne in mind that the Gros area already accounted for several traffic calming measures implemented in the past and already experienced a reduction in traffic accidents over the last years.

Indicator	Before (2009)	BaU (2011)	After (2010)	After (2011)	Difference: After – Before	Difference: After – BaU
20. Injuries and deaths caused by transport accidents (Intxaurreondo)	44	42	38	39	-5	-3

As for the radar system, results in Intxaurreondo has reveal its effectiveness, inducing an important decrease in injuries and deaths the year after its implementation (13,6% as compared to the Before situation; 11,6% if the BaU decreasing pattern is taken into account). Although in 2011 a slight increase has been accounted, traffic safety levels remain at a satisfactory level, as compared to the Before and BaU situation.

At the city level, if compared to the reference year situation (2002), traffic safety in Donostia - San Sebastián has considerably improved, to a great extent due to the changes in driving behaviour fostered by the CIVITAS measures. While in 2002 the number of deaths and severe injured people was 8 and 119, respectively, in 2011 5 persons were killed in traffic accidents and 51 resulted severe injured. This means a 56% reduction in the overall number of deaths and severe injured people (37,5% for deaths and 57% for severe injuries).

Following is a table with the results of the Transport System indicators. Average traffic speeds have been measured in the main street of each neighbourhood (Antiguo: Calle Zarautz; Centro: Calle Fuenterrabia; Gros: Calle de Segundo Izpizua; Intxaurreondo: Calle Otxoki). Traffic speeds in the other streets of each neighbourhood are lower; therefore the impacts would be more limited:

Table C2.2.2: Transport System

Indicator	Before (Jun 2010)	BaU (date)	After (May 2011)	After (Dec 2011)	Difference: After – Before (May 2011)	Difference: After – Before (Dec 2011)
23. Average vehicle speed–peak (Centro)	28.57	N/A	24.05	23.92	4.52	4.65
24. Average vehicle speed-off peak (Centro)	30.05	N/A	26.67	26.86	3.38	3.19

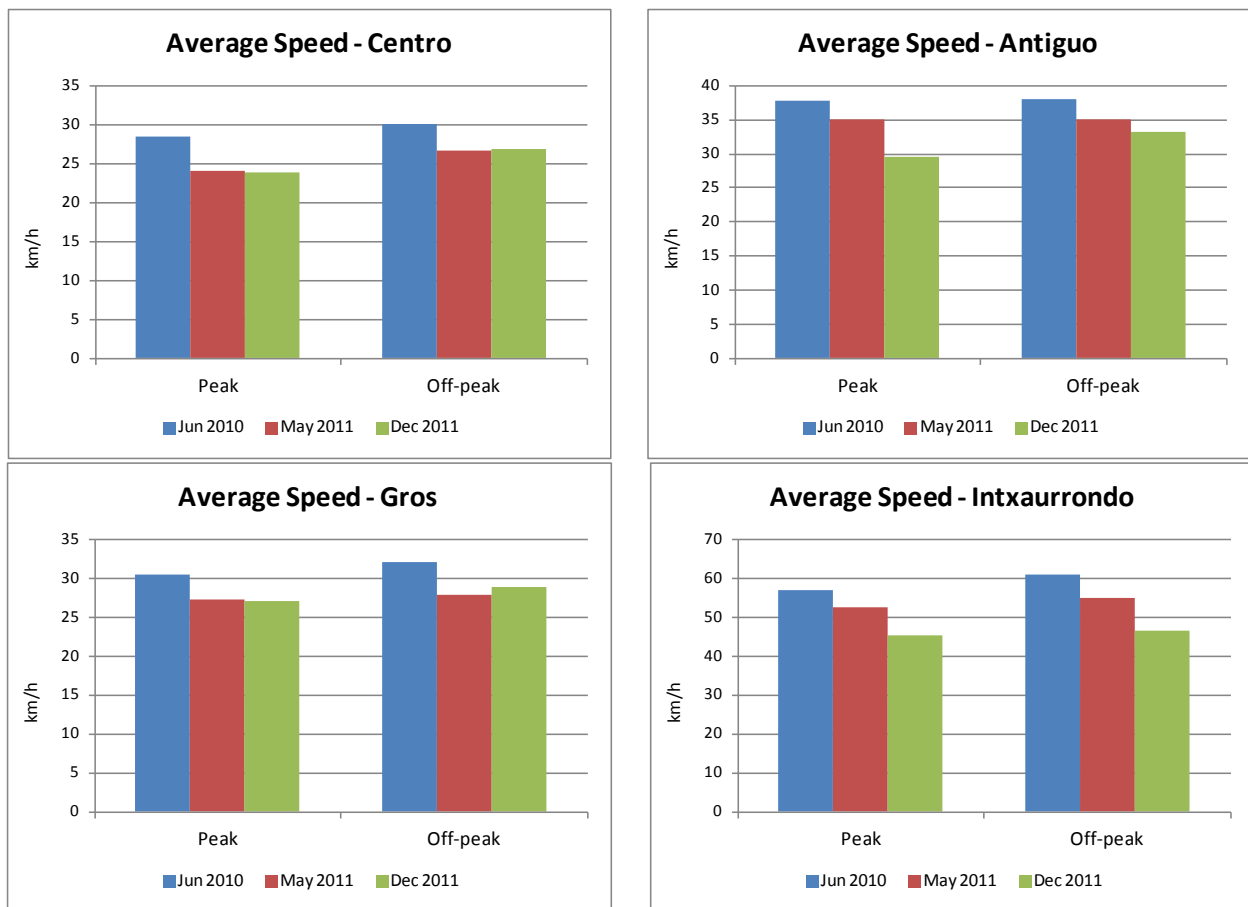
Indicator	Before (Jun 2010)	BaU (date)	After (May 2011)	After (Dec 2011)	Difference: After – Before (May 2011)	Difference: After – Before (Dec 2011)
23. Average vehicle speed–peak (Antiguo)	37.73	N/A	35.01	29.5	2.72	8.23
24. Average vehicle speed-off peak (Antiguo)	37.95	N/A	35.07	33.22	2.88	4.73

Indicator	Before (Jun 2010)	BaU (date)	After (May 2011)	After (Dec 2011)	Difference: After – Before (May 2011)	Difference: After – Before (Dec 2011)
23. Average vehicle speed–peak (Gros)	30.53	N/A	27.26	27.17	3.27	3.36
24. Average vehicle speed-off peak (Gros)	32.13	N/A	27.92	28.95	4.21	3.18

Indicator	Before (Jun 2010)	BaU (date)	After (May 2011)	After (Dec 2011)	Difference: After – Before	Difference: After – Before
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					(May 2011)	(Dec 2011)
23. Average vehicle speed–peak (Intxaurreondo)	56.82	N/A	52.51	45.47	4.31	11.35
24. Average vehicle speed-off peak (Intxaurreondo)	60.77	N/A	55.02	46.45	5.75	14.32

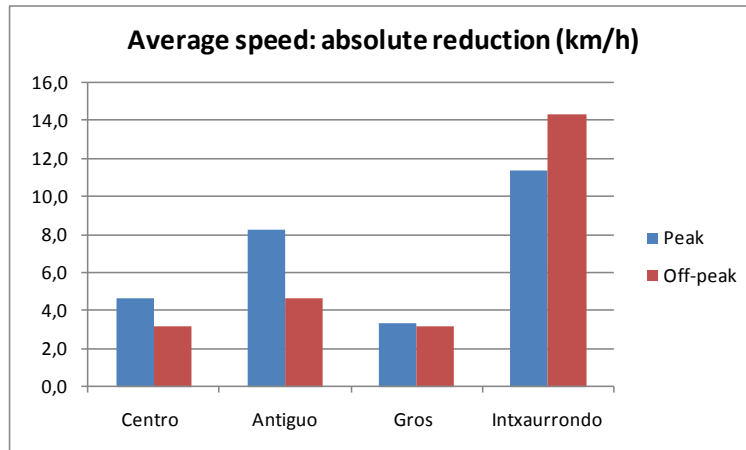
The following graphs show the evolution of speeds in these areas. In all cases it can be seen how the implementation of the measures was followed by a significant reduction in traffic speeds in all areas.



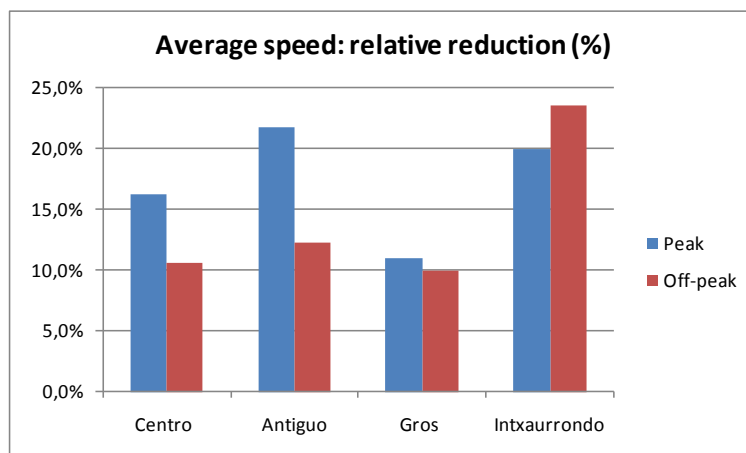
Picture 14: Average speed in the affected neighbourhoods

After a few months in operation, traffic speeds are stable. While Gros and Centro has experienced a small increase in the off peak hours, in Antiguo and Intxaurreondo has experienced a further reduction in their average traffic speeds, both in peak and off-peak hours. It can be seen how the traffic speed reduction achieved by the radar system in Intxaurreondo is bigger than the one achieved by the 30-km-zones in the other neighbourhoods.

Although the absolute reduction in average speeds is not very high, it is significant in relative terms.



Picture 15: Average speed reduction (absolute values)



Picture 16: Average speed reduction (relative values)

While Intxaurreondo clearly achieves the higher reduction values in absolute terms, in relative terms the speed reduction experienced during peak hours in Antiguo and to a lower extent in Centro, is equally relevant. Gros' results are more moderate both in absolute and relative terms, although significant for a neighbourhood where there were traffic calming measures already implemented before the CIVITAS measure.

Overall, it should be noticed that the average speeds before the implementation of the measure were not very high. Nevertheless, the average decrease achieved is considered a positive result, allowing for better conditions for the performance of non-motorized modes, and it is seen as a first step in a driving behaviour change.

Also, it should be remarked that these reductions did not had any impact in traffic fluency in these areas. It is also important to highlight that the measures have been positively accepted by the population and no mayor opposition existed.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	Design three 30-km-zones	**
2	Installation of radar systems in at least three locations.	**
3	Implementation of changes at 50 crossings	**
4	Reduce the number of fatal accidents and serious injuries by 50% compared to 2002 figures	**
NA = Not Assessed O = Not Achieved * = Substantially achieved (at least 50%) ** = Achieved in full *** = Exceeded		

C4 Upscaling of results

Although it is expected that the new driving patterns induced by these measures will also impact on overall drivers' behaviour, also in other neighbourhoods, 30-km-zones and the safe districts concept could easily be up-scaled to other neighbourhoods in the city, like Amara and Egia. According to the above results, an average 9% reduction in traffic casualties could be expected from the implementation of these measures, derived from an average speed reduction of 19% and 11% for peak and off-peak hour respectively.

Additional radar systems could also be implemented in other arterial roads in Donostia-San Sebastian, like Pº de Bizkaia and Avenida del Alcalde José Elosegui. In this case, with Intxaurreondo case study as a reference, a 14% reduction in the number of injuries and deaths caused by traffic accidents can be expected, while speed levels would decrease by a 20% during peak hours and 23% in off-peak periods.

Also this kind of interventions could be transferred to other areas in the Gipuzkoa region.

C5 Appraisal of evaluation approach

If we want to make an appraisal of the evaluation approach there are different aspects that should be kept in mind. Firstly, we have decided to assess the results separately in every district, as the projects have had different development depending on the case. We have considered that this was the best way to be able to compare the available information and data, and to reach conclusions and draft recommendations.

Secondly, we have used three different sources of information for the analysis. On the one hand, we have used the Mobility Department information, mostly referred to traffic speeds in the different areas of the city. On the other hand, injuries and accidents information is provided by the Local Police. This is sometimes problematic due to the statistical use they made of this information which is not always in accordance with the required scope for our purposes. Finally, we have used the 'ad hoc' surveys made by the mobility department regarding "social" indicators. The main issue concerning this data source is the lack of historical background to establish a comparison with the previous situation (or in order to estimate BaU values).

As for the amendments in the evaluation approach, at this stage of the project, the following issues have been identified:

- About the objectives, it was probably not very useful to establish the year 2002 as the framework for comparison. The situation maybe should be compared with data of

2007, 2008 and 2009. And the objective to reduce 50% compared with data from 2002 it seems that is not very realistic.

- It could be interesting to include a specific survey among cycling users in order to assess their perception of the improved (or not) 'cyclability' in 30-km-zones.
- Although it was not the main scope of the measures in Donostia-San Sebastian, it could also be interesting to undertake traffic counts in the affected areas, in order to evaluate the ability of the measures to reduce passing-through traffic in the concerned areas.

C6 Summary of evaluation results

Both approaches have revealed effectiveness towards the overall objectives of the measures, i.e. the reduction in the number of deaths and injured people caused by traffic accidents and the decrease in average traffic speeds.

Moreover, results from the evaluation have confirmed the suitability of each approach to their corresponding context: while 30-km-zones have provided further improvements in residential areas where traffic speeds were already low, although not enough for non-motorized mobility promotion purposes; radar systems are more suitable for main arterial streets where traffic speeds are high and fast and significant reductions are pursued in order to adapt it to the urban context.

A big majority of the population supports the implementation of the measures, with just a minimum share of population clearly against it. Accordingly, population's perceived security has increased after the implementation of the measure, even when this perception was already high before the CIVITAS project started. The perception of security has also increased among bicycle users, being this one of the measure objectives.

Nevertheless, the good results achieved seem not to have reached the population in all its extent, whose perception of the measures was slightly better before its implementation, revealing that the high expectations were not totally fulfilled. Since the measure results are being very positive, it seems like more communication efforts are required, especially concerning 30-km-zones.

C7 Future activities relating to the measure

About the 30-km-zones, during the CIVITAS Archimedes project, but not as part of it, other 30-km-zones have been implemented in the Ibaeta-Igara district. This is mainly a business area. Evaluation has not yet been undertaken as in the other three 30-km-zones in the city.

Overall, we see 30-km-zones as a significant improvement in mobility and traffic safety in the city. Results in the demonstration areas need to be analysed, but it is the intention of the Municipality to implement this type of measures in other areas of the city. Certain areas in Amara, Intxaurreondo and Egia districts can be considered as potential implementation areas. But this implementation will depend on the political-technical decisions and the funding opportunities.

On the other hand, the implementation of specific 30-km-zones in the city of San Sebastián is something new. It had never been afforded before and this fact should be considered when evaluating. Maybe some evaluation during the next years should be carried out in order to clearly understand the impact in these demonstration areas.

D Process Evaluation Findings

D.0 Focused measure

X	0	No focussed measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviations from the original plan

The deviations from the original plan comprised:

- **Safe districts and 30-km-zones late implementation.** This task should have been finished in month 24, Sept 2010, and was finally implemented in January 2011, month 28. This deviation due to some delays in the mayor works has supposed that the evaluation has not been carried out at the date that it was planned and it had to be postponed. As a consequence of that, the conclusion to the evaluation process will have to be made later than expected.
- **Safe districts and 30-km-zones information campaign late implementation.** As the main works had some delay, the information campaign was also delayed. We thought that the information campaign had to run parallel to the construction This is the reason for the delay of the information campaign
- **Radar system substitution.** Resulting from the preparation phase, it was decided that instead of three pure speed control radars, two radar would be used in combination with one red light camera systems.
- **Dissuasive enlargement of the radar system approach.** Based on the dissuasive effect proved by radar systems in other locations, it was decided to use the two speed control radar in combination with five radar cabinets. The radar systems operate on a rotator basis, while the other remains empty, while majority of car drivers does not know where the radars are actually operating.

D2 Barriers and drivers

D2.1 Barriers

The main barriers encountered for the development of measure DSS 46 and DSS 47 are:

Preparation phase

- **Political/Strategic:** The political involvement is needed to implement a project like this in one or more areas in the city. In some cases this kind of measures are used as a matter of political opposition, making it difficult to achieve the required level of involvement.
- **Involvement/Communication:** Concerning the establishment of a Road Safety Pact, some problems aroused when defining priorities, planning and even taking technical decisions due to the different character and variety of interest of the involved stakeholders.

- **Cultural:** If not clearly explained to the population, there might be public opposition against this kind of measures, especially because there is still a strong negative reaction from drivers to car use restriction measures. It is necessary to assess, in some way, the position of the citizens in the area and at least it is necessary to know if there will be a strong opposition.

Implementation phase

- **Financial:** Although quite obvious, the availability of funds for the development of the measure, which includes street re-design works, it is one of the main barriers
- **Technological:** Constructive measures are subject to uncertainties ranging from tendering procedures to weather conditions. The potential risk for delays is high, increasing public opposition levels.

Operation phase

- **Cultural:** Radars and other speed control devices have been vandalised several times. This issue has impacted the economical development of the measure.

D2.2 Drivers

As for the drivers, the main ones affecting both measures are:

Preparation phase

- **Political/Strategic:** Although sometimes affected by political circumstances, there is a shared vision for road safety in the city which has led to the establishment of a Road Safety Plan. Moreover, the measures are part of an overall strategy to improve road safety as well as non-motorized mobility conditions.
- **Spatial:** If correctly chosen, the characteristics of the selected areas must be seen as a driver, since the implementation is easier than in a physically not suitable area.
- **Institutional:** Recent legislative changes in Spain regarding 30-km-zones have favoured the adoption and raised the potential success of this measure.

Implementation phase

- **Financial:** The availability of CIVITAS funding has been a significant opportunity to develop these measures.

Operation phase

- **Involvement/Communication:** Although potentially conflictive, the positive citizen's reaction to the measures has acted as an important driver in the development of the measure. This is especially true in the case of residents, pedestrians and cyclist who are increasingly claiming for more public space, as well as for safer and more comfortable infrastructures.

D2.3 Activities

In order to handle the above referred barriers and/or to make use of the drivers, the following activities were taken during the implementation of the measure:

Preparation phase

- **Political/Strategic:** Resulting from an on-going dialogue with all civic associations during the preparation and implementation phases, a Citizen Road Safety Pact was approved and sanctioned in the Municipal Government Board and presented to the Mobility Advisory Committee
- **Technological:** An in-depth review of best practise regarding speed control approaches has been developed, in order to apply the findings in the definition and implementation of the measures in the city.

Implementation phase

- **Involvement/Communication:** An intensive communication campaign has been developed in order to acknowledge citizens about the new concept implemented in the city.
- **Operation phase**
 - **Cultural:** Dissemination activities have been designed in order to increase public acceptance of road safety measures.

D3 Participation

D.3.1 Measure partners

Following there is a brief description of all project partners and its level of involvement with the measure:

- **Department of Mobility - City of Donostia-San Sebastian** - Planning and implementation of the measure. Leading role.
- **Mobility Advisory Board** - Support the process to select the safe districts, the design of infrastructure and the campaigns to explain the changes. Principle participant.
- **Civic associations** - Planning and support in communication campaigns. Occasional participant.

D.3.2 Stakeholders

The main stakeholders of these measures have been described in the above section D.3.1.

Police Dept.
Residents?

D4 Recommendations

D.4.1 Recommendations: measure replication

- **Attractive-Visible:** final results of the works must be something attractive and visible. People must clearly know that they are entering a 30-km-zone. And this aspect can also be a driver. If the areas are attractive and visible, will be more accepted by neighbours.
- **Easily implemented:** It is necessary to implement something easy. Otherwise people will think that all these works were not worth doing.

D.4.2 Recommendations: process

- **Complete information:** when the information campaign was implemented, people who were in favour of the measure wanted to go further and some of them asked how the speed of cars was going to be measured and controlled in order to limit it. Complete information should be provided to the population in order to gain its support to the maximum extent.
-

Measure title: Safe districts and 30-km-zone + Road safety measures

City: Donostia – San Sebastián Project: ARCHIMEDES Measure number: 46 + 47

E Summary time schedule

Task No.	Task name	YEAR 1												YEAR 2												YEAR 3												YEAR 4																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48					
11.5.2	Road safety studies	Red																	X	Blue																																		
5.5	Safe districts and 30 kilometre zones	Red																	Yellow	Yellow	Yellow	Yellow	Yellow	X	Blue																													
5.6	Citizen Road Safety Pact	Red						Yellow	Yellow	Yellow	Yellow	E 1	Yellow	Yellow	Yellow	X	Blue												E 2	Blue												E 3												
5.7	Radar Speed Control	Red						Yellow	Yellow	Yellow	E 1 X	Blue												E 2	Blue												E 3																	
Evaluation tasks		Grey																																																				
Process evaluation report																			X													X													X									
Deliverables		Grey																																																				
M12.1 Draft MLEP										X																																												
D12.1 Final MLEP																									X																													
D12.2 baseline and first results Temp																																	X																					
D12.3 Draft results Temp																																															X							
D12.4 Final result temp																																																X						

F Annex: Survey Questionnaires

Before Survey

Profile

- a) Age:.....
- b) Gender (Male, Female)
- c) Occupation (Self-employed; Employed; Student; Unemployed; Homemaker; Retired; Other)
- d) Municipality:.....
- e) Do you have a car available daily trips? (Yes, No)

Specific Questionnaire

1. Are you worried about traffic accidents in Donostia - San Sebastián?
(Very much, Quite much, Not too much, A little, Not at all)
2. Do you think Donostia San Sebastián is a safe city for drivers?
Do you think Donostia San Sebastián is a safe city for cyclists?
Do you think Donostia San Sebastián is a safe city for pedestrians?
(Yes, No, DK/DA)
3. What is your assessment of traffic safety in Donostia - San Sebastián?
(0/very bad - 10/very good)
4. In your opinion, which are the main causes for traffic accidents in Donostia - San Sebastián?
(Signalization, Pavement maintenance, Drivers, Pedestrians, Cyclists, Others:, DK/DA)
5. How do you assess drivers regarding the observance of traffic regulations?
How do you assess cyclists regarding the observance of traffic regulations?
How do you assess pedestrians regarding the observance of traffic regulations?
(0/very bad - 10/very good)
6. Do you believe that there is a need to take actions to improve traffic safety in Donostia - San Sebastián?
(Yes, No, DK/DA)

7. What is your assessment of the traffic safety measures foreseen by the municipality?

(Adequate, Not enough, Inadequate, I don't know them)

8. Do you believe that speed limitations will improve traffic safety in the city?

(Yes, No, DK/DA)

9. Do you believe that radar systems will improve traffic safety in Donostia - San Sebastián?

(Yes, No, DK/DA)

10. Do you believe that 30-km- zones will improve cyclists and pedestrians safety?

(Yes, No, DK/DA)

11. Do you believe that the promotion of walking and cycling can improve traffic safety in Donostia - San Sebastián?

(Yes, No, DK/DA)

12. Currently, are you considering the use of the bicycle as a transport mean within the city?

(Yes, No, DK/DA)

13. How would you assess the signing of the Citizen Road Safety Pact?

(1 - 5)

After Survey

Profile

- f) Age:.....
- g) Gender (Male, Female)
- h) Occupation (Self-employed; Employed; Student; Unemployed; Homemaker; Retired; Other)
- i) Municipality:.....
- j) Do you have a car available daily trips? (Yes, No)

Specific Questionnaire

- 14. Are you worried about traffic accidents in Donostia - San Sebastián?
(Very much, Quite much, Not too much, A little, Not at all)
- 15. Do you think Donostia San Sebastián is a safe city for drivers?
Do you think Donostia San Sebastián is a safe city for cyclists?
Do you think Donostia San Sebastián is a safe city for pedestrians?
(Yes, No, DK/DA)
- 16. What is your assessment of traffic safety in Donostia - San Sebastián?
(0/very bad - 10/very good)
- 17. In your opinion, which are the main causes for traffic accidents in Donostia - San Sebastián?
(Signalization, Pavement maintenance, Drivers, Pedestrians, Cyclists, Others:, DK/DA)
- 18. How do you assess drivers regarding the observance of traffic regulations?
How do you assess cyclists regarding the observance of traffic regulations?
How do you assess pedestrians regarding the observance of traffic regulations?
(0/very bad - 10/very good)
- 19. Do you believe that there is a need to take actions to improve traffic safety in Donostia - San Sebastián?
(Yes, No, DK/DA)

20. What is your assessment of the traffic safety measures being implemented by the municipality?

(Adequate, Not enough, Inadequate, I don't know them)

21. Do you believe that speed limitations have improved traffic safety in the city?

(Yes, No, DK/DA)

22. Do you believe that radar systems have improved traffic safety in Donostia - San Sebastián?

(Yes, No, DK/DA)

23. Do you believe that 30-km- zones have improved cyclists and pedestrians safety?

(Yes, No, DK/DA)

24. Do you believe that the promotion of walking and cycling can improve traffic safety in Donostia - San Sebastián?

(Yes, No, DK/DA)

25. Currently, are you considering the use of the bicycle as a transport mean within the city?

(Yes, No, DK/DA)

26. How would you assess the signing of the Citizen Road Safety Pact?

(1 - 5)