Measure title: **Safe access for pedestrians to peripherical neighbourhoods in Burgos**

City: **Burgos** *Project:* **Caravel** *Measure number:* **11.12**

A Introduction

A1 Objectives

The measure outlines a transitional strategy to improve safety and mobility conditions in the peripheral neighbourhoods.

- **Objective 1:** To establish safer conditions for pedestrian access and mobility in peripheral neighbourhoods.

A2 Description

In the municipal area of Burgos City there are some new neighbourhoods, which used to be small villages with a very low number of inhabitants and, as a consequence, have very attractive features as the village centre has houses that are built out of local stone around a village square. They are located between 3 to 15 kilometres away from the town.

Civitas project identified these locations and defined the possibilities to improve the transport modes and the traffic security in the area. A pilot project was launched and the technical document was planned. The model obtained in the pilot peripherical neighbourhood can be transferred other similar city areas which facilitated that the population of these areas have increased their quality of life and the facilities of sustainable transport.

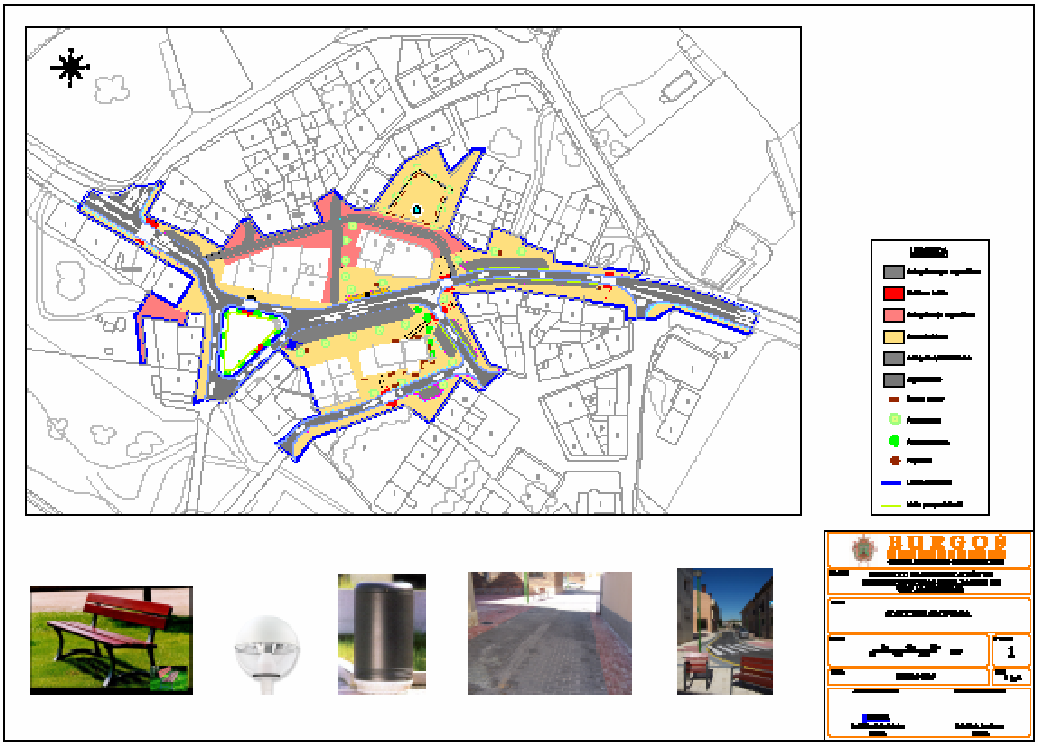


Image 1: Scheme of the pilot technical project in Villalonquejar neighbourhood

B Measure implementation

B1 Innovative aspects

- **New physical infrastructure solutions:** Improve the local and safety mobility in the peripherical neighbourhoods through solutions in the infrastructures of the area that considered mainly the design of pedestrian areas and locations for vehicles.

B2 Situation before CIVITAS

The city of Burgos had expanded by as much as 20 km, absorbing outlying villages into its outskirts. Access to these new neighbourhoods is by motorway and former footpaths have been converted into roads. Residents wishing to leave their neighbourhoods on foot or bicycle have to cope with roads without sidewalks to protect them from passing vehicles and they are forced on many occasions to use the hard shoulder on narrow highways. This caused many residents and visitors to these neighbourhoods to use their cars for all routine travel, which has led to increasing traffic around these areas in the last few years. In addition, mobility problems had become more severe due to the fact that these neighbourhoods have high growth rates. Their population had doubled in recent years because of the high price of housing closer to the city centre, with the result that 2 or even 3 cars per family may be needed to solve transport problems.

Image 2: State of art Villalonquejar neighbourhood

B3 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Identification of situation in peripherical neighbourhoods *(from July 1st, 2005 – to December 18th, 2006)* – The stage included the definition of the situation on sustainable mobility and infrastructures in the peripherical neighbourhoods.

Stage 2: Steps for improvement *(from March 1st, 2006 – to July 30th, 2007)* – The stage included the preparation of sidewalks for development in outlying areas of the city, as well as attractive spaces in which pedestrians can walk and rest

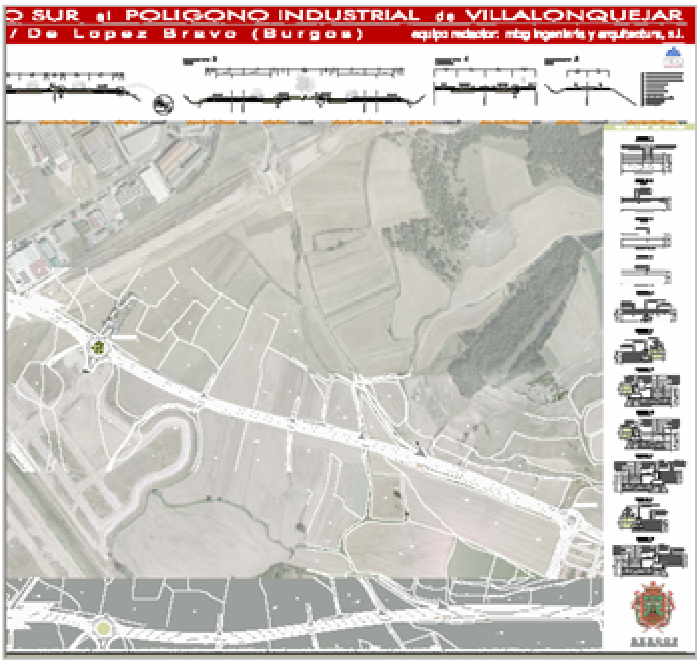


Image 3: Project to develop path lane and sidewalks to Villalonquejar neighbourhood

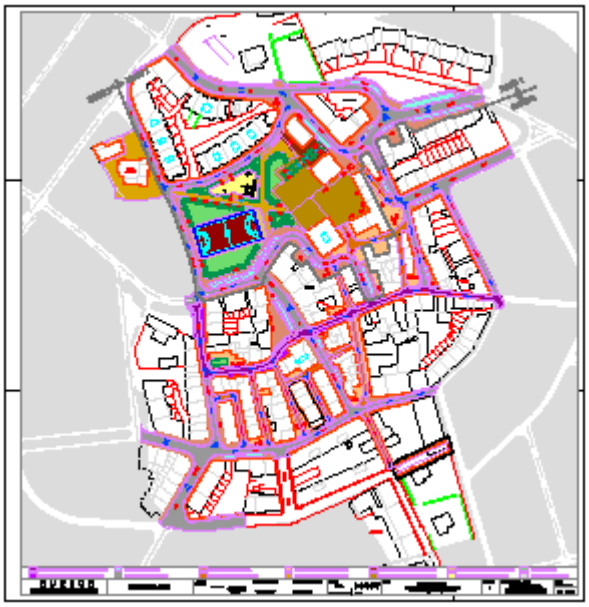


Image 4: Launch other technical project and development in other peripherical neighbourhoods of the city (Villatoro and Cortes)

Stage 3: Promotion *(from February 15th, 2006 – to July 30th, 2007)* – Educational campaigns and marketing for the mobility and accessibility for all citizens

Stage 4: Evaluation of the activities *(from February 1st, 2005 – to December 31st, 2008)* – All the evaluation activities were performed according to the evaluation plan.

B4 Deviations from the original plan

No problems have been arisen during the implementation. All foreseen activities took place as planned.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure 6.2.- Integrated access restriction strategy in Burgos –** Similar configuration for the pedestrian areas have been transferred to the surrounding areas. The aim was to improve the safety conditions against vehicles, to obtain more walking and resting spaces for the citizens.
- **Measure 8.2.** – **Clean high mobility services in Burgos –**The aim was to improve the quality of the services offered to the citizens of these areas and to guarantee adequately the frequency of the buses.
- **Measure 11.13. – Increasing bicycle use in Burgos** – Analyze the possibilities of the surrounding areas to introduce the path lanes and the connections with other close to path lanes.
- **Measure 11.15. – Safety and accident prevention plan in Burgos** – Safety of the people in the surrounding neighbours

C Evaluation – methodology and results

C1 Measurement methodology

C1.1 Impacts and Indicators

The evaluation of this measure consists in the monitoring, all over the duration of the project, of the development of the level of the service and of its use. Many quantitative and qualitative parameters (derived from direct market analysis, customer satisfaction reports and surveys) have been used to give an exhaustive view of the success of the actions
The evaluation has been taken place with a strong interrelation with similar activities under development at a national and international level by Instituto Tecnológico de Castilla y León (ITCL) partner.

11.12. SAFE ACCESS FOR PEDESTRIAN TO PERIPHERICAL NEIGHBOURHOODS IN BURGOS						
Evaluation Category	**N°**	**Indicator**	**Units**	**Source of data**	**Methodology for indicator construction (survey, modelling, etc)**	**Baseline date**
Transport	21&22	Traffic flow (day/night)	Vehicles/ hour	Traffic equipment	Measure/Calculated	-
Transport	GI	Number of traffic related injuries in target areas	Nº injuries	Traffic equipment	Measure/Calculated	-
Transport	GI	Number of soft users in improved areas	Nº users	Traffic equipment	Measure/Calculated	-
Society	GI, M 17	Perception of safety	5 point scale	Questionnaires	Measure/Calculated	Julio 2007

Detailed description of the indicator methodologies:

Indicator	**Methodology for indicator construction**	
	Definition	**Methods of Measurement**
21&22. Traffic flow (day/night)	Traffic flow (peak/off peak) is the intensity daily vehicle flow during the day and night hours. Unit: intensity vehicles/hour	Method: Traffic flows including loop detectors, counts from video recordings, roadside counting… Data collection should be cover both peak and off peak periods. Frequency: At least twice during the project. Target group: general traffic
(GI) Number of injures caused by accidents.	Number of injuries and deaths is defined as the average number of injures and deaths in traffic accidents. Unit : number of injuries and deaths	Method: The number of injuries and deaths will be submitted by the police department Frequency: Once a year until end of the project Target group: traffic accident
GI. Number of soft users in improved areas.	Number of soft users is defined as the number of users of new pedestrian areas Unit : number of users	Method: These data will be obtained by visual inspection Frequency: 2 twice during the project Target group: citizens
17. Perception of safety	Perception of security is defines as the perceived security of a service by its users. For PT this concerns PT vehicles as well as at and around the PT stops. Units: index	Method: In the sites/areas, perceived PT security can be assessed though a survey which take the form of mailed questionnaires, face-to-face interviews… Frequency: Measurements should be made 2 twice during the project Target group: PT or other service users.

C1.2 Establishing a baseline

Various tools were used to evaluate the 4 performance indicators for this measure. Further information was gathered from data sources of the Municipal Services, principally data of Police Department. The frequency of measurement and the exact source data are defined in the section C1.1. and C2. of this document.

Additional survey work took place on July of 2007 to establish the first data which included the acceptance and perception of citizens to the safe access for pedestrians.

C1.3 Building the business-as-usual scenario

The peripherical neighbourhoods of Burgos were characterised by ancient people with a low population density, consisting of a few houses around the church, school or city hall. Over the past 20 years the population increased in these neighbourhoods due to lower price of land and housing as they are on the outskirts of the city consolidated. These people began to grow in a heterogeneous and virtually no urban planning. In addition, lack of adequate public transport services and infrastructure caused the level of vehicles was raised to usurp the main pedestrian crossing areas and recreation of these environments.

If the project had not been conducted (do nothing) the impact of private vehicle would have remained very high. Pedestrians and residents would not have space to enjoy as vehicles continue to occupy the largest space on the narrow streets of the neighbourhood. Moreover, it will be carried out by interconnecting bike path / sidewalks of the city with the peri-urban enclave, being the only possibility of the private vehicle mobility. In the pilot area, more than 2,000 people are enjoying now their streets and a good part of them (more than 200) use the bicycle for the day by day trips. The number of accidents has decreased (from 20 incidents with cars and pedestrians to less than 5) mainly because of the reorganization of the cars and the car parking and the calming measures performed.

C2 Measure results

The performance indicators for the evaluation of Measure 11.12. are broken into 2 sections: transport and society. Many of these indicators were evaluated using both quantitative and qualitative data collection methods. A full explanation of the indicators and how they were quantified is available in the section C1.1 and C1.2. of this document.

C2.1 Economy

N/A

C2.2 Energy

N/A

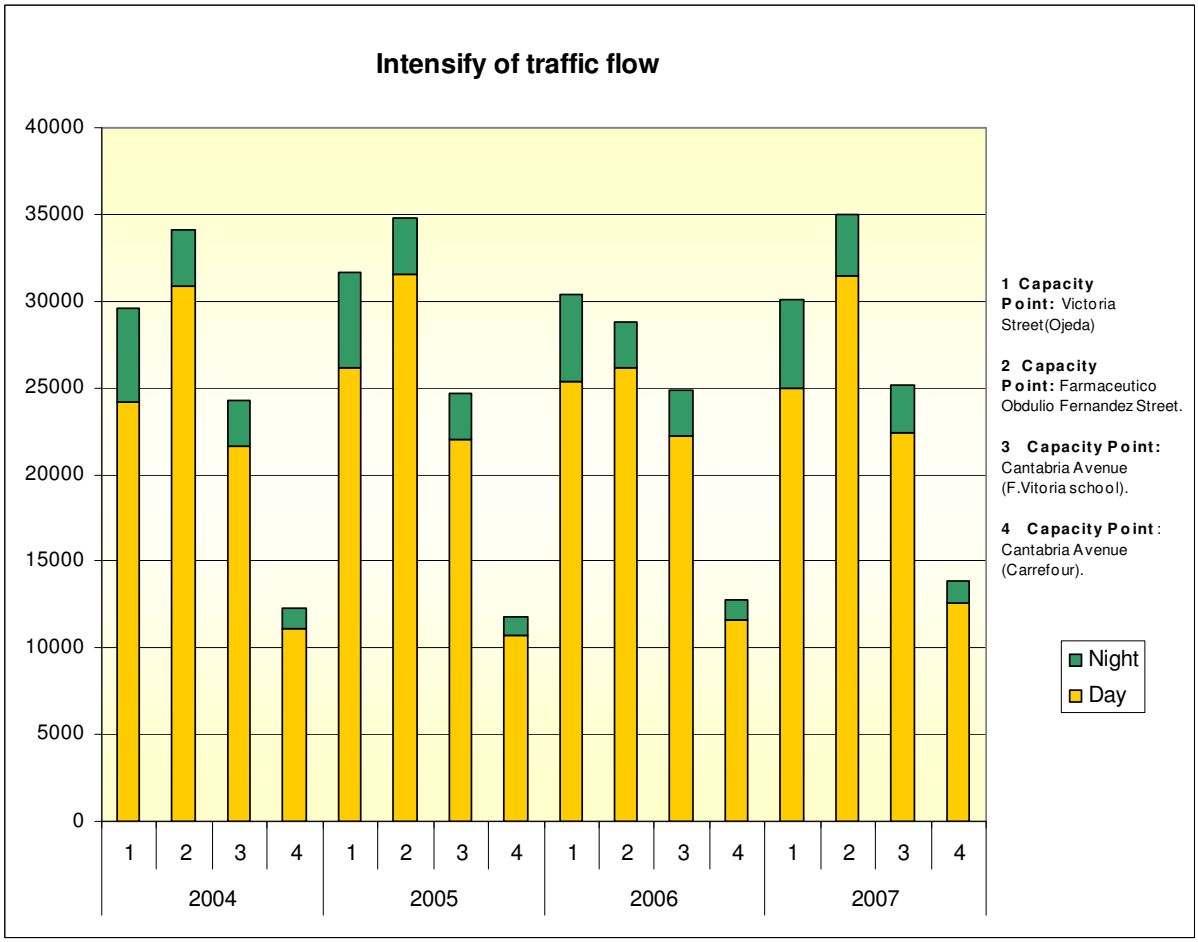
C2.3 Environment

N/A

C2.4 Transport

Indicator – Traffic flow

Table 1: Results of transport indicators				
Indicator		**Baseline Data**	**Baseline Data**	**Data Result**
		2005	**2006**	**2007**
(21&22) **Traffic flow (day and night)**	Day	90.451	85.197	91.334
	Night	3.233	2.693	3.571



Graphic 1: Traffic Flow in some parts of the city (Source Traffic Department)

The traffic in the different parts of the city assessed was about 90.000 vehicles. However, there were so differences among these zones, for example, zone 2 respect to zone 4, approximately 20.000 vehicles. In the four points had the same tendency during the years, except to 2006 year, zone 2, where the urban works in the area and maintained of capacity points reduced the intensity of vehicles detected respect to other years. It showed that the traffic of the city was not reduced in the time of the project but it hasn't suffered a big increased and for example, the point number four (the one in the peripherical area) hasn´t increased so much despite the higher number of inhabitants in the area.

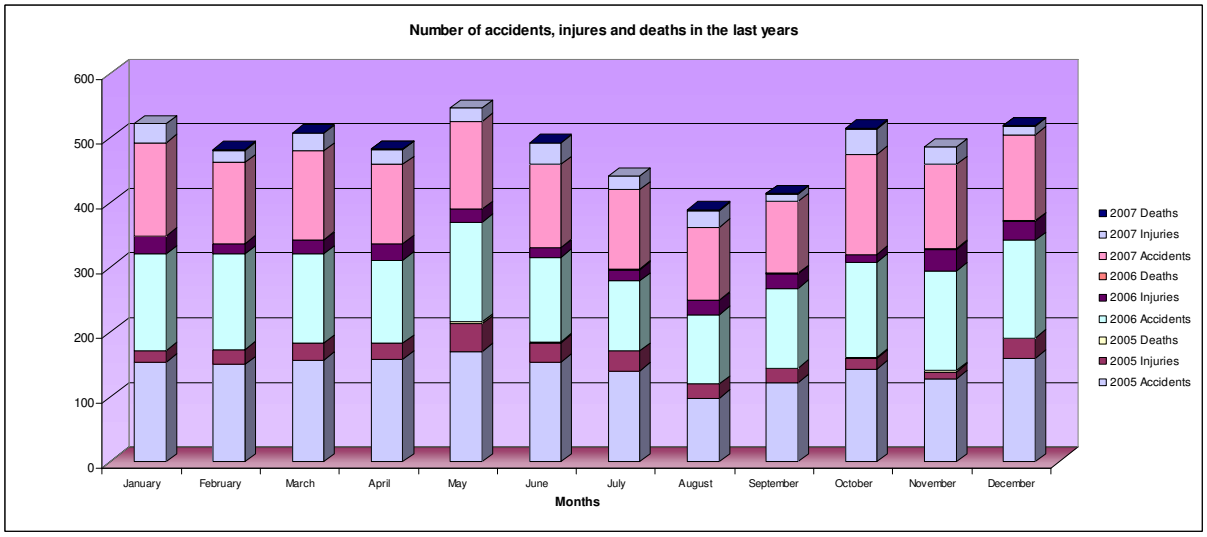
C2.5 Society

Indicator - Number of injuries caused by accidents

Table 2: Results of society indicators (I)			
Indicator	**Baseline Data**	**Data Result**	**Data Result**
	2005	**2006**	**2007**
(GI) **Number of injuries caused by accidents**.	300	260	261

The data were obtained of the Annual Memory of Local Police, the data showed that the number of injuries caused by accidents were reduced to 40 injures in two years. In the next graphic showed by month the number of accidents, injures and deaths in the last years.

October 2007 was distinguished by the most number of accidents in the city and also the most number of injures. Also, May 2005 also was a month with high level of accidents, injures and deaths. In the summer time the number of accidents and injures was also reduced. During 2005, all months had deaths however, in 2006 and 2007 only some months, as March, June, August, September and December had some deaths, linked to the holiday's time.



Graphic 2: Number of accidents, injuries and deaths (Source Annual Local Police Memory – 2005, 2006, 2007)

There is a reduction anyway in the area improved, and in general in the peripherical areas, concentrating the accidents in the big main roads of the city. There is a reduction also in the whole city, not big but promising for a better result in the future. The main reason from 2005 to 2006 was the implementation of calm measures, installation of radars and promotion. These three tools gave a good tendency to maintain in the future.

Indicator - Number of soft users in improved areas

Table 3: Results of society indicators (II)			
Indicator	**Baseline Data**	**Data Result**	**Data Result**
	2005	**2006**	**2007**
(GI) **Number of soft users in improved areas**	150 users	231 users	342 users

The areas where the traffic conditions and quality of life treated to improve, were in surrounding neighbours which was in the peripheral area, at least 8 kilometres to the town. These villages had a drop number of citizens although it was increased when the citizens began to buy house cheaper than town. The project began to develop in one neighbourhood, Villalonquejar,. The baseline data include the residents of the area more beneficiated by the measure. The total number of soft users which were benefited with the planned activities were around 800 residents in two years, because the similar projects was launched after in other surrounding neighbourhoods. The main facilities they use are the pedestrian areas and paths as well as bicycle lanes and paths.

Indicator - Perception of safety

Table 4: Results of society indicators (III)			
Indicator	**Relevant Question**	**Baseline Data**	**Data Result**
		2007	**2008**
(17) **Perception of safety**	How you think is the quality of the structures/paths to cross the roads?	Very good: 4% Good: 52% Normal: 29% Low: 11% Very Low: 0%	Very good: 0% Good: 33% Normal: 55% Low: 9% Very Low: 3%

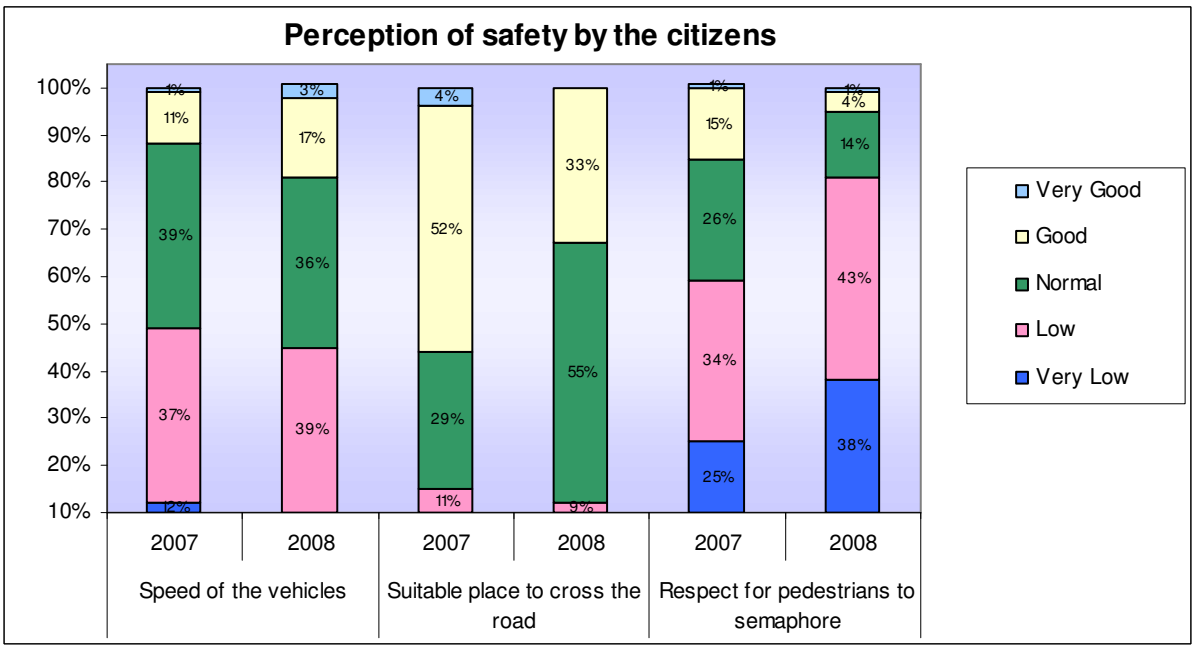
2007 Data results: 250 citizens in all city completed and returned the survey with the aim to the rate of the perception of the safety regarding the quality structures to cross the roads. 36,4% of the respondents were male and 63,6% female. The age ranges of the respondents were distributed as 4,8% (<20), 27,6% (20-30), 19,2% (31-40), 38,0% (41-65) and 10,4% (>65).

The respondents were asked if they were aware the perception of safety, 4% stated that the quality of the structures/paths to cross the roads was very good, 52% stated it was good, 29% stated that it was normal, but 11% stated it was low and 4% stated it was very low.

2008 Data results: In the same way, 250 citizens completed and returned the survey. In this case, 53,2% of the respondents were male and 46,8% female. The age ranges of the respondents were distributed as 6,3% (<20), 21,6% (20-30), 27,1% (31-40), 27,9% (41-65) and 17,1% (>65). 33% stated that the quality of the structures/paths to cross the roads was good, 55% stated that it was normal, but 9% stated it was low and 3% stated it was very low.

Regarding to this question, quality structures to cross the roads, the respondents considered that the paths are good in more than 80% (included normal, good and very good answers) in 2007 and 2008. Although the normal and good opinion was modified from year to year it implies that the citizens considered that places to cross the roads habitual and normal situation in his life.

The question was focus on the entire city so it doesn't reflect exactly the situation in the area improved, where the results were more favourable. The Council knows that there are still some crosses to improve as well as some roads.



Graphic 3: Perception of the safety of citizens in neighbourhood areas. Comparison of relevant information about safety in these areas: speed of the vehicles, respect for the semaphores by the pedestrian and suitable places to cross the road./streets

Moreover, two additional questions were launched to assess the perception of safety of the citizens regarding to speed of vehicles and if the pedestrian respected to the traffic lights.

Respect to speed of vehicles, the respondents considered that the velocity of the vehicles was good and normal around 50% in both years but also low (38%) in 2007 and 2008. The speed was considered as a key factor to the safety of the citizens, and they considered in general terms adequate for the safety. It is mainly because of the Traffic calm measures already implemented, radars and new more restricted laws some factors of the new situation.

In other hand, the respondents considered that only 42% in 2007 and 23% in 2008 of the pedestrian respected the traffic lights. There was a clear tendency (19%) of the users to cross the streets without tend to account the traffic lights, the users crossed the road in the best place for them without to wait the semaphore time. Moreover, the percentage of respondents that considered very low the behaviour of the pedestrian to cross the road was increased 13% in one year.

At the same time, the pedestrians don't respect the proper places to cross the roads and they cross in un suitable places provoking dangerous situations.

So, we can say that the measures against the high speed or the traffic calm have meant a success and for the future it is good to think in other measures to force the pedestrians to cross the streets in suitable places and to improve the respect of the traffic lights. The perception of the pedestrian behaviour is even bad in the point of view of the pedestrian. Without forgetting the improvement of the measures to fight illegal or poor respect behaviour in the drivers of the car, it is good to improve too the behaviour of the pedestrians to reduce the accidents.

C3 Achievement of quantifiable targets

No.	Target	Rating
1	To establish safer conditions for pedestrian access and mobility in peripheral neighbourhoods	***

NA = Not Assessed * = Not achieved **= Achieved in full *= Exceeded**

C4 Up-scaling of results

Up-scaling of this measure is possible due to its continued success, Burgos City Council are committed to providing best condition of safety and quality of life for other small and peripherical neighbourhoods of the city. The process began with Villalonquejar neighbourhood at the beginning of Civitas – Caravel project and this strategy is being transferred to other similar neighbourhoods following the success of previous phases. During Civitas – Caravel project, many users of these peripherical neighbourhoods expressed a desire to improve the road safety for citizens and to recuperate the spaces for the pedestrian with right regulation of the traffic and parking for the cars. Many of the lessons learnt and experience gained through the Civitas-Caravel project will be used in the implementation of peripherical neighbourhoods of the city. Also, political commitment has also been given to these new projects. This is reinforced by existing plans for peripherical neighbourhoods in accordance with the Burgos Strategic Plan for neighbourhoods.

The upscaling of this measure will have application in other neighbourhoods of the city, which will affect 11% of the citizens of the city which is living in these peripherical areas respect to 4% affected by the measure. The impact in the population in these areas will be so important because will affect to the safe conditions and quality of live of the inhabitants. The areas could calm traffic and offer new areas to spare time without dangerous for the children.

C5 Appraisal of evaluation approach

N/A

C6 Summary of evaluation results

The key results are as follows:

- **Safe conditions for the neighbourhoods** – The pilot project increased the level conditions of the security and safety of the neighbourhoods in surrounding areas. It was allowed the quality of life in this area was well accepted by the citizens.
- **High demand of other neighbourhoods –** A result no expected was the high demand of the inhabitants of other neighbourhoods to realize the improvements in their area with the aim to calm the traffic and to increase the life conditions.
- **Transfer results in other surrounding neighbourhoods –** The good results of the pilot project were transferred to other surrounding zones with the same criteria to increase the quality of life of the citizens, improvement the safety and reduction the traffic impact.

D Lessons learned

D1 Barriers and drivers

D1.1 Barriers

- **Barrier 1** – Physical interference between measures and urban structures in demo area which might delay activities. To avoid such interference, a prior check would be carried out by the City Planning department and the Civil Engineering department to examine activities and specifications in the demo area

D1.2 Drivers

- **Driver 1** – The strong political commitment to improve the quality of live of the surrounding areas and to guarantee safety of pedestrian.

D2 Participation of stakeholders

- **Stakeholder 1 - Residents of target area:** With the project, the residents had obtained better conditions of life and new modus of sustainable transport for the peripherical neighbourhood due to that the area improved in traffic security, more space for the spare time and reduction of the pollution.

D3 Recommendations

- **Select to criteria in the urban design -** Urban design was integrated in the first part of the project with a complete technical projects where was designed the elements to improve the quality and safety in the area.
- **Marketing campaigns to inform of the obtained results –** Wide information and communication is fundamental to acceptance of the project in the phase of design. Later, when it already is realized, important campaign to transfer the results with the aim of other neighborhoods know the final implementation and the advantages of the measures used for calming traffic and safe conditions.

D4 Future activities relating to the measure

To continue the implementation in other surrounding areas and to improve the elements which are connect by paths and sidewalks the city with the peripherical neighbourhoods.

Many of the conditions used in the design of this pilot project was recompiled to include in new General Plan for Urban Development with the aim to improve the conditions in future developments of the city with special protection to pedestrian and inhabitants respect to the impact of the private vehicle..