

Measure title: **Car pooling in Burgos**

City: **Burgos**

Project: **Caravel**

Measure number: **09.01**

A Introduction

A1 Objectives

The measure outlines to establish short and long-distance car pooling systems.

- **Objective 1:** Encourage an initial group of 450 individuals from the university, business sectors and neighbourhoods to participate in car pooling
- **Objective 2:** Offer incentives and organise management systems to encourage car pooling
- **Objective 3:** Promote long-distance car pooling

A2 Description

The measure aimed at developing car pooling systems: a new innovative measure that had never been attempted before in the city of Burgos. It focused on steps to organise car pools for daily travel to areas where traffic congestion was all too common: industrial parks, nearby neighbourhoods and university areas. The technological tool consisted on a web site designed to facilitate contacts between potential participants.

The performance, Office of coordination of the plan of mobility and promoting car-pooling, was aimed at effecting change in the habits of mobility, using different alternatives and real, which can trigger changes. This was to encourage the rational use of the car and improve other means of transport more sustainable, generating benefits both employers and employees, and higher than other groups, such as students and individuals carrying out movements of medium and long-haul, even in the same province.

To coordinate all companies and workers estate and other groups, it was essential to have an office where they can address all the demands and queries raised. The office centralized the management of mobility, coordination and organization of the mobility plan of the site and other actions to be covered at the local level in terms of mobility.

The project was launched initially in the Villalonquejar Industrial Area as pilot project to favour the promotion of mobility in a places where the diary movements to work were high. All activities planned will be transferred to the Council to promote to other levels the mobility more sustainable. The car pooling system have been defined for all possible travel (long and short distances), but initially, as pilot project the promotion of the tool will be performed in the Villalonquejar industrial area.

B Measure implementation

B1 Innovative aspects

To develop car pooling in a medium-sized city that focused on daily travel to and from industrial parks, nearby neighbourhoods and university areas where dense traffic and traffic jams were common during rush hours. Promote the introduction of car pooling in companies and neighbourhoods collaborating directly to relieve unsustainable traffic flows from the city toward the industrial parks.

This includes the following innovative aspects of the measure are:

- **New conceptual approach:** New system to use the private car more efficiency through a new info-tool and mobility office. It allowed that the people could chose between different alternatives of transport instead of private car.
- **Use of new technology/ITS:** New platform to promote the car pooling system had been developed. The info-tool consisted on web pages to facilitate the contact between person with cars and passenger that to find car more easily.
- **New organisational arrangements or relationships:** the development of specific tools and procedures to manage the use of car pooling system.
- **New physical infrastructure solutions:** The creation of a mobility office in the most important industrial area of the city was launched as a pilot project to promote the information on mobility to the citizens. One of the principal activities was the promotion of the car pooling system.

B2 Situation before CIVITAS

Car pooling in the city is not a common practice; vehicles carry on average 1.2 passengers per trip. Habitual car pooling in the city is limited to company employees who share a similar itinerary and work schedule. Although the degree of occupancy in such cases never reaches 100%, it is generally around 50%. It is common practice in the city to go everywhere by car. Generally, there is just one driver with no passengers. No specific actions have yet been undertaken to encourage car pooling.

B3 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Launch of analysis technological platform (from August 1st, 2006 – to December 30th, 2007) – Development and testing of the upgraded technological system for the management of car pooling operations.

- Development of a computer system accessible from the Internet: The office of mobility have an Internet platform from which can be accessed any information mobility plan. Moreover permit and manage the platform specifically to enhance the car-pooling



Image 1: Web pages of the Mobility Office (www.ofimovi.es)



Image 2: Web Pages of car pooling system (www.ofimovi-comparte.es)

Stage 2: Analysis of the car pooling in target groups (from August 1st, 2006 – to December 30th, 2007) - Implementation study for car pooling for different target groups and Design and development of an integrated scheme of car pooling in all its aspects.

- Development of office mobility of Villalonquejar Industrial Park: The office was managed by a person who knows all the actions that developed mobility plan, and managed all the information it receives both of businesses and employees.



Image 3: View of the Mobility Office in the Villalonquejar Industrial Area

- Establishment of an internal regulation for the promotion of car-pooling: For the analysis of the information collected on the platform, as well as the

confidentiality of the data collected, it will be necessary to define another internal regulation that defines the information accessible to users. The scope of the responsibilities of the driver as insurance coverage, conducting detours on the road "in itinere" setting conditions compromise, alternating drivers or state of the vehicles, determine the conditions of confidentiality of users in the platform, setting the procedures to be conducted during the absence or emergency situations, low user and commitments of drivers and passengers.

Stage 3: Political debate stakeholders (from March 30th, 2007 – to December 30th, 2008) - Management of the political debate with all the stakeholders through the Mobility Office

- Meetings with companies to define and validate the information and to coordinate dissemination: the agents involved in the different actions of the mobility plan, meetings will be maintained to ensure the proper implementation of the system. They also validated the information available on the Internet platform, as well as all the requirements for the proper management of data confidentiality, criteria for the use of the platform, user requirements, and so on.

Stage 4: Launch the car pooling system (from March 30th, 2007 – to December 30th, 2008) – Implementation of car pooling system in short and long distance. The inauguration of the Mobility Office and car pooling system were inaugurated in March 2007. The users could visit the Office and the pages web to know the advances in mobility and to find persons to share the vehicle.

Stage 4: Promotion (from April 15th, 2007– to July 30th, 2008) – Educational campaigns and marketing to promote the to promote the car pooling

Dissemination of information to users: was necessary for all workers and other groups aware of the creation of this office mobility, the different actions of the mobility plan and all information which was available from the platform. For this reason, since the office coordinated the development and dissemination of information campaigns to users. These campaigns were carried out both at the beginning of the project, to disseminate the contents of the platform and the office, as periodically to assist in the awareness of all workers



Image 4: Poster and brochures to promote the car pooling system

Stage 5: Evaluation of the service (from February 1st, 2005 – to September 31st, 2008) – All the evaluation activities have been performed according to evaluation plan.

B4 Deviations from the original plan

No problems have been arisen during the implementation. All foreseen activities run well.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure 8.5. – Collective mobility service for target group** – Parallel Actions realized since the Mobility Office to promote the sustainable transport in industrial areas
 - **Measure 11.2 - Sustainable mobility marketing in Burgos.** – Several campaigns have been developed to aware the citizens to park adequately.
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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 taken place with a strong interrelation with similar activities under development at a national and international level by ITCL.

9.1 CAR POOLING IN BURGOS						
Evaluation Category	N°	Indicator	Units	Source of data	Methodology for indicator construction (survey, modeling, etc)	Baseline date
Society	14	Acceptance level	%	Questionnaires	Measured/ Calculated	July 2007
Society	13	Awareness level	%	Questionnaires	Measured/ Calculated	2004
Transport	28	Average occupancy	Number of passengers per vehicle	Counts manually	Measured/ Calculated	2005
Society	GI	Change in mode of travel	-	Questionnaires	Measured/ Calculated	July 2007

Detailed description of the indicator methodologies:

Indicator	Methodology for indicator construction	
	Definition	Methods of Measurement
13. Awareness level	Awareness level is defined as the percentage of the population with knowledge of a measure on account of provided information. Unit: %	Method: Data could be collected by means of surveys (e.g. questionnaires by mail or by face-to-face interviews). Awareness can be at a variety of levels, it depends on the measure. Frequency: Measurements should be made 2 twice during the project Target group: general public (including residents and visitors), operators, PT, customers...
14. Acceptance level	Acceptance level is defined as the percentage of the population who favourably receives or approve of the measure. Unit: %	Method: User acceptance can be assessed through surveys (e.g. questionnaires by mail or by face-to-face interviews). In the questionnaire: <ul style="list-style-type: none"> • YES or NOT Frequency: Measurements should be made 2 twice during the project Target group: general public (including residents and visitors), operators, PT, customers...
28. Average occupancy	Average occupancy is defined as the average number of passengers per vehicle per trip Unit : number of passenger per vehicle (%)	Method: Data should be collected by mode both during the peak and off peak periods. Frequency: At least twice during the project Target group: Public transport vehicles and passenger cars.
GI. Change in mode of travel	Change in mode of travel is defined as the capacity of carpooling (journey to work/during work)	Method: Data can be collected by means of surveys (e.g. Questionnaires by mail or by face-to face interviews) Frequency: Data will be collected on an annual basis. Target group: company employees.

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 different Mobility Plans in the Villalonquejar Industrial Area in 2005 and recently in 2008, principally data for workers and companies in Villalonquejar Area. 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 awareness, acceptance and accessibility and timekeeping information of workers to the initiative and the car pooling.

C1.3 Building the business-as-usual scenario

If the project had not been conducted (do-nothing scenario), the user who works in the industrial area would not be able to share vehicle beyond those working in the same origin and / or destination. If the measure wasn't implemented at least a 6% of the workers in the industrial area had not shared the vehicles and at least 300 trips more should be performed per day. Moreover, the average occupancy will be less than 1,15 passengers per vehicle.

No action would have been developed earlier in the city to encourage car-pooling and neither would have been installed with an office staff that to organize, promotion and management topics of mobility in the industrial area.

C2 Measure results

The performance indicators for the evaluation of Measure 9.1. 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

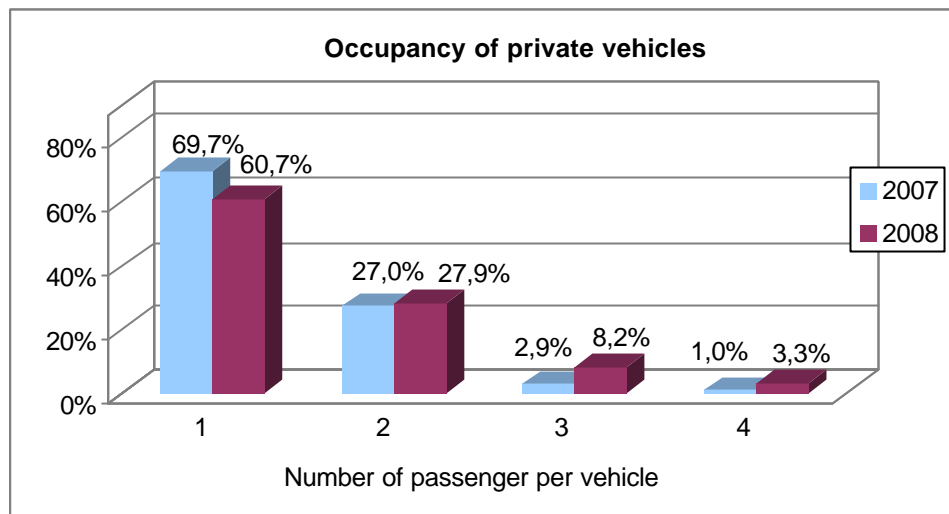
N/A

C2.4 Transport

Indicator	Data Result	Data Result	Data Result
	2005	2007	2008
(28) Average occupancy	1,15 %	1,46	1,53%

The data was obtained by measuring traffic in the industrial area of Villalonquejar, in 2005. The traffic measurements were made on a working day, in normal conditions of movements

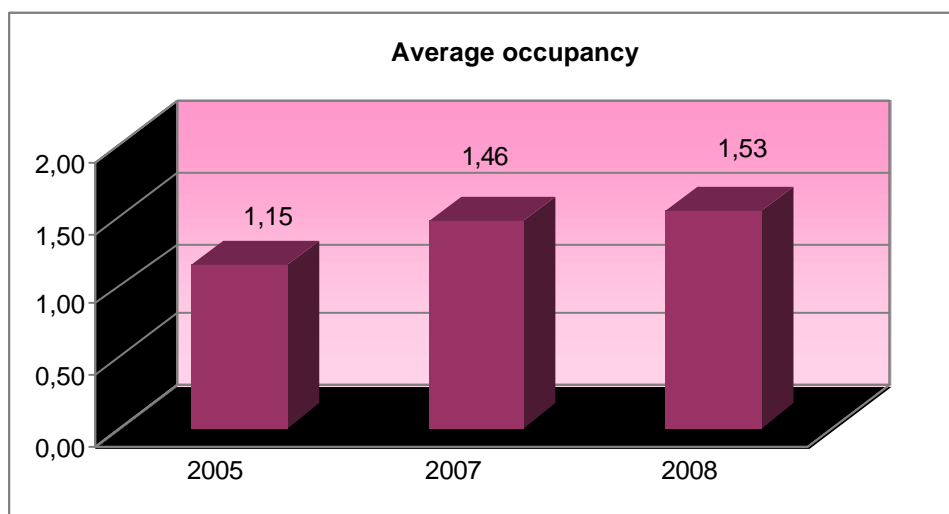
of workers (not in holiday period) during several hours on peak and off peak hours. The measurement traffic points were in the three roads to access the industrial area. The same manual count was made in 2007 and 2008. The next graphic shows the results of the number of passengers per vehicle



Graphic 1: Percentage of Number of passenger per vehicle in 2007 and 2008)

The result data shows the number of vehicles with only one person has been reduced by 9% in one year. The percentage of the vehicles with two passengers was increased by 1%.. However, there was a significant increase of the number of vehicles with three passengers (4%) and four passengers (2%). This positive tendency indicated that the workers began to change the use of private vehicle to go to work. The last measurement in 2008 was performance after implementation of the measure. Thus, the development of the activities has shown a positive effect on the habits of the workers, increasing the occupancy of the vehicles with a high impact on the one passenger vehicle rate and the increase of the three and four passengers per vehicle rate.

Respect to the baseline information, the results show the positive evolution of the average of occupancy per vehicle, which was increased in four years, although it is far away from the average of 2 occupants. The next graphic shows the tendency.



Graphic 2: Comparative Average occupancy of private vehicles in the industrial area

This tendency is not only the result of the car pooling measure, as it shows the impact of the marketing actions, the continuous work developed with enterprises as well as workers through information and workshops with the representants of the workers and enterprises.

C2.5 Society

For the society indicators, the same methodology was used in 2007 and 2008, according to the rules defining in the C1 section.

Survey work took place in July of 2007 to establish the Baseline Scenario which included the **awareness, acceptance** of drivers to initiative and the evaluation of car pooling strategy.

The survey for **awareness and acceptance level** to establish the data results of **drivers** to initiative and the evaluation of car pooling strategy took place between June/July of 2008. In these surveys, same questionnaires of 2007 surveys were presented to the **workers** in different areas of the Villalonquejar industrial area. The principal aim was understanding and awareness if the car pooling strategy had any influence in the mobility issues of the workers.

Name of target group	Date of survey	Sample size	Purpose	Relevant question to assess
Drivers	July 2007	250	Awareness acceptance and change in mode of travel of specific measure	Awareness level - Do you use your private car to go to work?
Drivers	June/July 2008	250		Acceptance level - Do you think that the car pooling strategies will improve the traffic in the city? Change in mode of travel - Are you well disposed to share your vehicle?

2007 Data results: 250 drivers completed the survey with the aim of rating their level of awareness regarding the use of private cars to go to work. 49,3% of the respondents were male and 50,7% female. The age ranges of the respondents were distributed as 5,8% (<20), 29,0% (20-30), 26,1% (31-40), 39,1% (41-65) and 0,0% (>65).

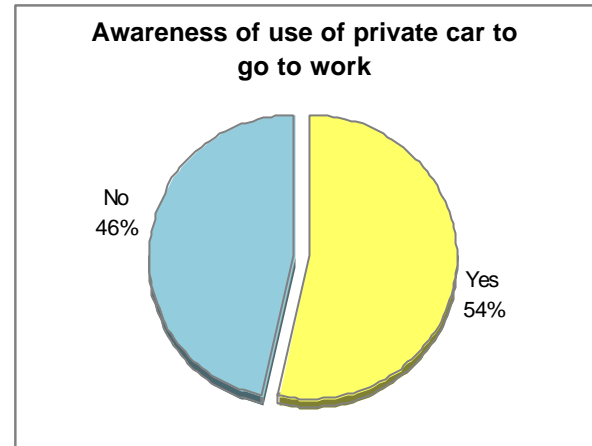
2008 Data results: In the same way, 250 drivers completed the survey. In this case, 76,0% of the respondents were male and 24,0% female. The age ranges of the respondents were distributed as 0,0% (<20), 22,0% (20-30), 47,0% (31-40), 30,0% (41-65) and 1,0% (>65).

Indicator: Awareness level

Indicator	Relevant Question	Data Result	Data Result
		2007	2008
(13) Awareness level	Do you use your private car to go to work?	YES: 54% NO: 46%	YES: 51% NO: 49%

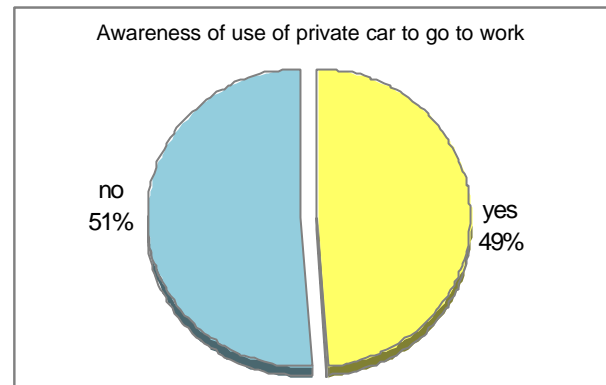
In 2007, the respondents were asked if they use their private car to go work, 54% stated that they used private car to go to work, but 46% didn't use private car to go to work.

Graphic 3: Awareness level of workers about car pooling in 2007



In 2008, 51% stated that they used private car to go to work, but 49% didn't use private car to go to work.

Graphic 4: Awareness level of workers about car pooling in 2008

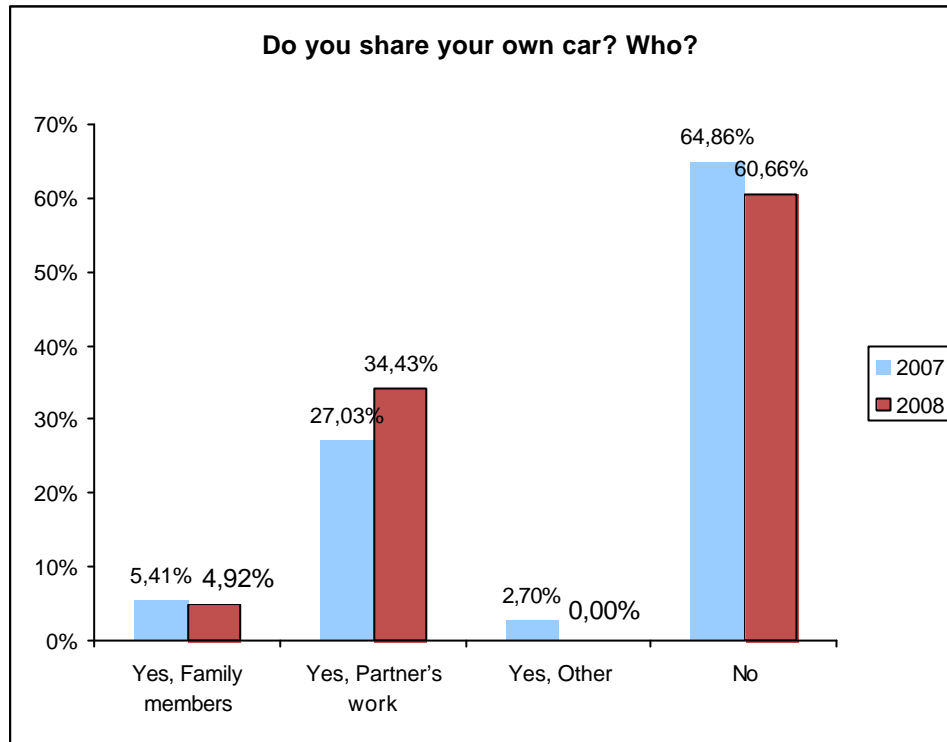


In conclusion, workers considered that they used the private car to go to work at least the middle of the answers. The tendency in 2007 and 2008 is similar, but a short variation could be observed. From the total amount of cars moving everyday to the industrial area, a 3% can mean around 300 cars less. These results show the tendency for the future years where the start point has been implemented thanks to this initiative.

Additional question were made to the workers in the surveys to understand if the workers shared their own vehicle and also, if the question was yes, who were the passengers.

The number of workers that answered that they didn't share their own car was reduced by 4% in one year (64% in 2007 and 60% in 2008) The rest of the workers that shared their cars (36% in 2007 and 40% in 2007) remarked that shared the vehicle with their family (5% in 2007 and 4% in 2008) and with other workers (27% in 2007 and 34% in 2008), and other (2,70% in 2007).

In the next graphic the data results are shown:



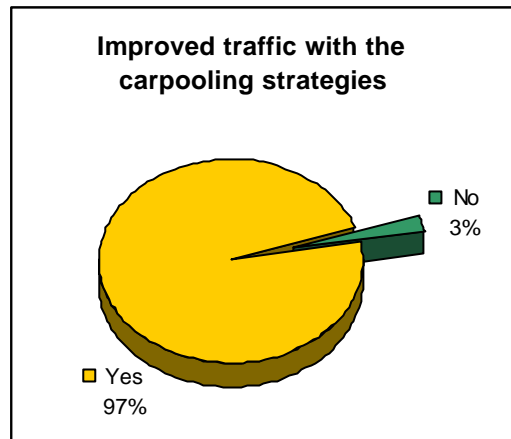
Graphic 5: Awareness about if the workers sharing own car and who in 2007 and 2008

We can say that after viewing the data that workers start to share their private car with the work colleagues (a 7% more) which is the data showing the good tendency of sharing car. It shows the same good tendency observed in previous graphs and surveys. The decrease of the number of people not sharing their vehicle has been decreased a 4%, which confirms the tendency again.

Indicator - Acceptance level

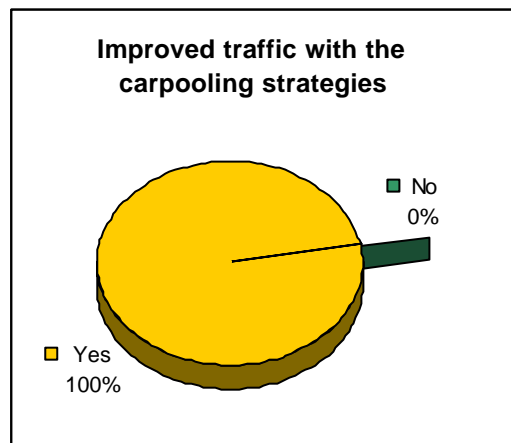
Indicator	Relevant Question	Data Result	
		2007	2008
(14) Acceptance level	Do you think that the car pooling strategies will improve the traffic in the city?	YES: 97% NO: 3%	YES: 100% NO: 0%

In 2008, the respondents were asked if they think the use of car pooling to go to work will improve the traffic situation in the city and 97% stated the car pooling strategies will improve the traffic in the city, but 3% thought that the car pooling strategies won't improve the traffic in the city.



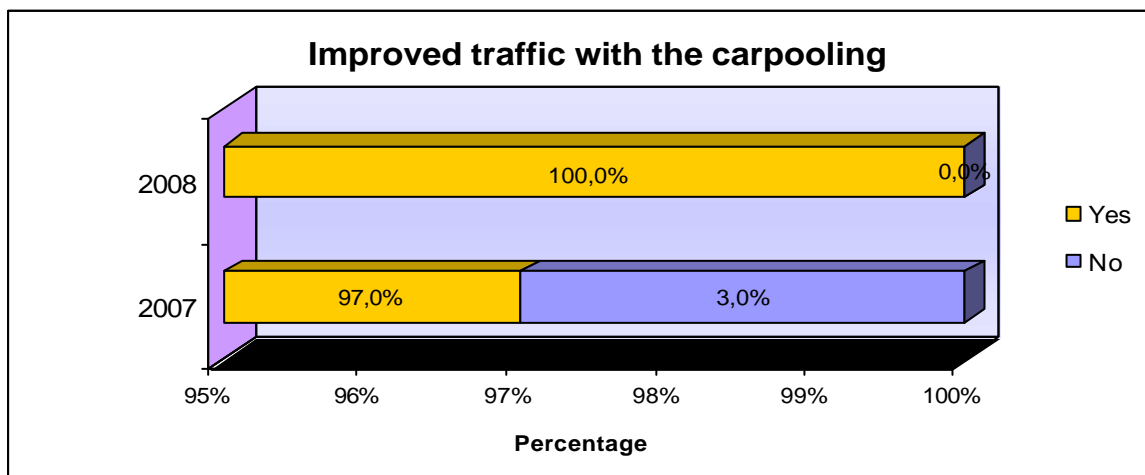
Graphic 6: Acceptance level of workers about car pooling to improve the traffic in 2007

In 2008, 100% stated the car pooling strategies will improve the traffic in the city.



Graphic 7: Acceptance level of workers about car pooling to improve the traffic in 2008

In conclusion, there was unanimity of the workers about the fact that carpooling strategies would improve the traffic situation of the city. As it can be seen in the graphic below there was a small difference between the results of 2007 and 2008.



Graphic 8: Comparative of acceptance level of workers about car pooling to improve the traffic in 2007 and 2008

With these answers the support of the citizens concerning these actions is clear. They are completely aware of the importance of this action and they agree that a change can be performed thanks to this. With this high level of acceptance, the following steps can be done to improve the use of the private car by the citizens in general, develop the incentives and supporting politically this new form of reduce the pollution or even programming new incentives at taxes level decrease for those companies which support these strategies.

Indicator - Change in mode of travel

Table 5: Results of society indicators (III)			
Indicator	Relevant Question	Data Result	Data Result
		2007	2008
(GI) Change in mode of travel	Are you well disposed to share your vehicle?	YES: 57,14% NO: 42,85%	YES: 86,89% NO: 13,11%

In 2007, the respondents were asked if they were well disposed to share the vehicle, 57,14% stated they were well disposed to share, but 42,86% opined that they are not willing to do so.

The respondents in 2008 confirmed with a solid 86,89% that they were well disposed to share the vehicle, while only 13,11% stated they are not willing to share it.

In conclusion, the results show that in 2008 there is a change in the opinion workers have towards the car pooling strategy, and there was an increase of 29% of those in favour of sharing their vehicle.

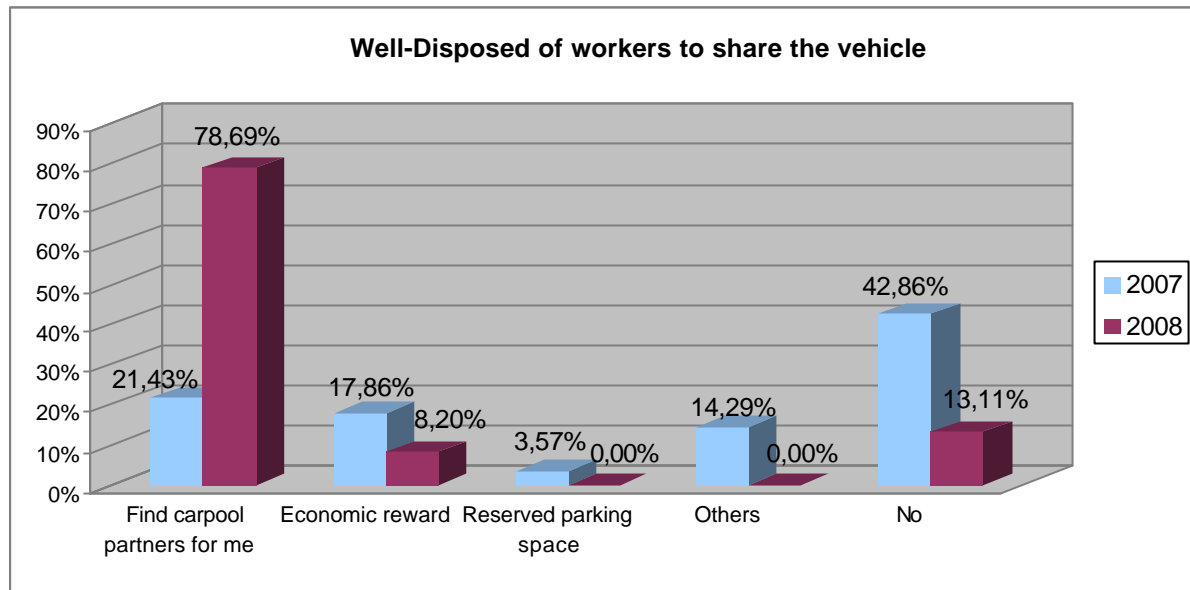
This confirms the good support by the workers to the initiative and confirms the future possibilities of success in this action.

This good answer can be influenced by the first actions developed in this field, as workers can see the advantages of the shared use in their colleagues. So, it is expected a chain reaction in order to find colleagues and share their cars for the everyday trips.

Between the reasons given to use the car pooling, workers have stated though, that the company should facilitate:

- The process of finding car pooling partners among workers with 21% in 2007 and 78% in 2008 being this the major request, that has grown a solid 57% in one year. .
- Economic reward was the main request for 17% in 2007 and 8% in 2008.
- Reserved parking space for carpool workers was indicated only by 3% in 2007.
- Other reason for sharing was offered by 14% in 2007.

On this way, it is clear that a good involvement of the companies is one of the key success for the initiative. Within these reason given, the actions concerning car pooling must be integrated with the offers given by the companies in order to increase the level of sharing. Thus, the companies must help the actions supporting with reserved park spaces, economic rewards or the facilities to find partners for the every day trip.



Graphic 9: Comparison of changes in the mode of transport to car pooling if the conditions are promoted by the company

C3 Achievement of quantifiable targets

No.	Target	Rating
1	Encourage an initial group of 450 individuals from the university, business sectors and neighbourhoods to participate in car pooling	**
NA = Not Assessed * = Not achieved ** = Achieved in full *** = Exceeded		

C4 Up-scaling of results

Up-scaling of this measure is possible due to its transference of results to other small cities in the Burgos province (study area for up-scaling). A desktop study was carried out to investigate the potential and initial information of these potential cities (number of habitants, transport facilities, companies and workers). So that, some small and with determinate level of critic mass would be eligible for the future exploitation of car pooling scheme.

A number of assumptions were made in this up-scaling. These were:

- The private vehicle is the habitual mode of transport in these small Burgos cities.
- The effect of the measure on encouraging workers is interesting because they lacked habitually of transport facilities to go to work, to shop, to leisure time...
- The number of important of habitants have to connection through internet to consult the trip by car pooling system.

So that, the same work of analysis in the potential areas were done in the up-scaling period.

The results of desktop study had the following conclusions:

- Important deficit of occupancy in the private cars was observed, then the objective to increase the level of occupancy will be the first aim for the up-scaling in these small cities.
- Important debates will be arranged with the stakeholders to favour the integration of car pooling scheme.

- Awareness campaign should be defined to inform and promote new car pooling services, via internet system.

C5 Appraisal of evaluation approach

After the evaluation of the measure, some considerations were done aiming at improving the evaluations of similar actions in the city. Some appraisals are the following:

- Realization of surveys periodically with different stakeholders (companies, workers, associations...). Every stakeholder has a different opinion of the mobility concept and the solutions for the industrial area should be according to the target group.
- Big effort of the measure was condensed in the implementation phases. The evaluation activities to obtain the data were delayed until that was running adequate.
- Evaluation of average occupancy and opinion to share private vehicle should be carried out periodically, with the aim to assure that the activities to promotion the car pooling are effectiveness.
- Realization of the demonstration phase with more time to have enough time to realize the evaluation process. The car pooling strategy needs long time period of implementation and the positive results will be with the progressive impact of the measures realized to aware the society in the time.

C6 Summary of evaluation results

The key results are as follows:

- **Average occupancy versus car pooling** – Through the intense labour realized by the Mobility Office in the industrial area of Villalonquejar, the average occupancy and the philosophy of car pooling began to know. The perception of the workers was changing and the idea of sharing their vehicles is becoming more common.
- **Encouragement of target groups** – The measure was launched in the industrial area with the consensus of the principal associations and syndicalism organization collaborated in the development of the activity planned.
- **Communication network with companies and workers** – To inform of the news and the new mobility conditions as regulations, incentives, articles, promotions, meetings... were realized by the Mobility Office to all companies and workers.
- **Mobility platform oriented to car pooling** – New mobility platform was designed for encouraging the people that wanted to share the vehicle. Through incentives and promotional campaign, the web site was more accessible to the workers.

D Lessons learned

D1 Barriers and drivers

D1.1 Barriers

- **Barrier 1** – Resistance to measures that might create obstacles to some actions. As prevention and to address potential problems in good time, different meetings were held with stakeholders to comment on critical factors and raised awareness of the measures.
- **Barrier 2** – Substantial cost increases for major components and budget modifications that might modify the project and any remaining measures. Then, to prevent financial problems, strict control systems will be put in place right from the start of the project. Moreover, the local committee prepared a contingency plan for such an eventuality.
- **Barrier 3** - Conflicting responsibilities between different local council departments for the development of measures that might delay demonstration activities. - In such an eventuality, the CIVITAS local committee decided which department should bear responsibility for the tasks and for coordination with other departments.
- **Barrier 4** - Failure to keep to the implementation deadlines and to satisfy quality conditions in technological systems. So that, to prevent such an eventuality by carefully stipulating the contractual conditions applicable to the supplier of equipment, as regards both quality and deadlines.
- **Barrier 5** - Dependency of different implementation steps within the measure that could lead to delays in the implementation timetable. A plan defining the different steps and their interrelations could be established to prevent dependence between consecutive steps.

D1.2 Drivers

- **Driver 1** – Social pressure to implementation new systems for promoting sustainable transport, in concrete the car pooling system

D2 Participation of stakeholders

- **Stakeholder 1** - Business association – The association of companies of Villalonquejar industrial area is an active association so interest in improvement the problems of the industrial, about all, the mobility. As this project, the communication and participation in the project was guaranteed
- **Stakeholder 2** – Syndicalism organizations – These associations were participated in the implementation of the car pooling phase and improvement in their associated a new culture of mobility to go to work.

D3 Recommendations

- **Design of the car pooling strategy** - It is essential to establish what the car pooling direction is and how the actions should be realized in the time. Planned the car pooling for a target groups per every stage is fundamental to favor that the target groups can be implicated and the results are optimum..

- **Promotional campaigns** – Every stage need a promotional campaign to involucrate the target group, however, the messages should be clear and concise.
- **Technological platform design according to necessities of the car pooling strategy:** The carpooling web site is specific for area of actuation where the target groups can be involved according to requisites of strategic plan for car pooling.

D4 Future activities relating to the measure

The car pooling strategy and platform, after the transference issues would be prepared to involve other potential target groups. There are plans to transform the mobility office of the industrial area to the context to the city, where the car pooling would be one of the start subjects.

Moreover, other industrial areas have required that mobility office, involve the target groups and car pooling programmes, between other would be launching.

Additionally, Instituto Tecnológico de Castilla y Leon (ITCL) partner has been elaborated and tested new technology equipment to integrate in the carpooling activities with the aim to favour the reliability in the process to share vehicles with unknown people. This technology will be operative at the beginning 2009 and the first users can used them during the next year.

Moreover, different application of these technologies are being designed to serve in the processes where the vehicle can be recognized by the occupancy average and then, incentives and promotional issues would be addressed to the users of car pooling.