

THE SOCIAL IMPACT OF THE TRAMWAY SYSTEM

O IMPACTO SOCIAL DO SISTEMA DE ELÉTRICOS*

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ABSTRACT/RESUMO

Technological change and responsible town planning are key parts of human development, as long as its social impact is an issue inherent in its implementation. Moreover, the revival of the tramway system represents a revolution and social commitment of industrialized countries. The main aim of this research is to gain more knowledge about the social contribution of public transport systems and draw up a proposal for improvement based on a thorough analysis on access, accessibility, and efficiency of public transport systems.

To achieve it, this paper provides the results of a research carried out prior to the introduction of a tramway system in a medium-sized city, reviewing the effects of such introduction on people with impaired mobility. We describe the context prior to the establishment of this system as well as the attitudes and meanings surrounding it.

A quantitative methodology is used, by means of survey technique, in order to perform a descriptive and factorial analysis, which leads to the knowledge and classification of the social impact of the tramway system in the city of Jaén (Spain). Prior to it, we reflect upon the processes that facilitate the removal of obstacles and barriers, addressing the incorporation of increasing technological offer, taking into account different perspectives.

Keywords: Public Transport, Tramway System, Social Impact, Social Barriers, Accessibility

Jel Codes: I30, I39, R40.

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A mudança tecnológica e o planeamento urbano responsável são peças-chave no desenvolvimento humano, sendo que neste último a questão é o impacto social inerente à sua implementação. Além disso, a revitalização dos sistemas de carros elétricos representa uma revolução social e um compromisso dos países industrializados. O principal objetivo desta investigação é obter um maior conhecimento acerca da contribuição social dos sistemas de transporte público e elaborar uma proposta de melhoria com base numa análise aprofundada sobre o acesso, a acessibilidade e a eficiência dos sistemas de transportes públicos.

De modo a alcançar o objetivo proposto, este artigo apresenta os resultados de uma pesquisa realizada antes da introdução de um sistema de elétricos numa cidade de média dimensão, analisando os efeitos de tal introdução junto das pessoas com mobilidade reduzida. Para tal, descreve-se o contexto antes da criação deste sistema, bem como as atitudes e os significados que o rodeiam.

O recurso a um inquérito foi a metodologia quantitativa utilizada, de modo a realizar uma análise descritiva e factorial que levou ao conhecimento e à classificação do impacto social do sistema de elétricos na cidade de Jaén (Espanha). Inicialmente, refletiu-se acerca dos processos que facilitem a remoção de obstáculos e barreiras, abordando a incorporação da crescente oferta tecnológica e tendo em conta diferentes perspetivas.

Palavras-chave: Transportes Públicos, Sistema de Elétricos, Impacto Social, Barreiras, Acessibilidade

Códigos JEL: I30, I39, R40.

1. INTRODUCTION

The current city model is characterised by high levels of dispersion that generate a considerable increase in the needs and demands which are related to mobility. Nevertheless, in spite of its unquestionable importance, there has been an insufficient number of researches into the need for mobility and the social impacts resulting from its availability or its absence. Moreover, such social impacts are difficult to identify, measure and understand.

Technological evolution and responsible town planning are key parts of human development, provided that their social impact is an inherent consideration in their implementation. At the same time, the reintroduction of tramway systems constitutes a revolution which represents the commitment of the most industrialised countries to society and to technology, which is part of the new trend towards environmental revolution.

In this paper, we aspire to advance in the knowledge of the contribution of the tramway system in Jaén (Spain). Specifically, we are making a proposal for improvement which is based on an exhaustive analysis of access¹ to public transport and of its accessibility² and efficiency. We start with the premise that inefficiencies in the tram system could be removed or considerably removed through a complete evaluation of such a system that takes into account the social dimension of its implementation.

In accordance with these premises, in this paper we offer the results of research carried out prior to the establishment of a tramway system in a medium-sized city (200.000 inhabitants approximately), where this kind of urban development experiences is completely new, but where they affect a large part of the population with mobility difficulties, because of personal characteristics such as age, disability, pregnancy, having to move babies in pushchairs, etc. However, we are not only interested in advance in the knowledge about the social impact of the tramway system on the potential user with mobility difficulties, but we also try to extend that knowledge towards the residents' social networks.

We have tried to describe the context prior to the introduction of this system as well as the system of attitudes and meanings that surround it. All this with the aim of advancing in the knowledge on the social aspects to be taken into account when building sustainable and social urban development infrastructures.

We used a quantitative methodology through a survey, with the aim of performing a descriptive and factorial analysis, which provided us with the knowledge and classification of the social impact of the tramway system in the city of Jaén. Previously, we reflected on the processes that facilitate the elimination of obstacles and barriers for people with mobility difficulties, with the aim of analysing the foundations of their integration into social life in a context

of growth of technological possibilities, in which a readiness to achieve objectives of equality is not enough, but in which, on the contrary, it is necessary to tackle their integration from different intervention parameters.

2. LITERATURE REVIEW

Actions related to public transport constitute one of the priority guidelines in urban and interurban regional transport policy, characterised by the promotion of sustainability and the reduction of saturation and/or congestion levels. This is mainly due to the fact that, since the end of the 20th century, Europe has witnessed important patterns of all-round growth towards the exterior and increased demand for personal transport. In short, there has been an increase in importance given to mobility in general, and on public transport systems in particular, as a means for carrying out different activities and reach key places, to cater to daily material needs.

Waldorf and Pitfield (2005) delved deeper into this idea, and highlighted the fact that mobility and transport have become basic prerequisites in day-to-day living, in the maintenance of social relationships and in reaching key places to cater to daily and healthcare needs. So we are witnessing an increasing interest in transport systems, as well as in their strategic reorientation. It should be noted that, at both micro and macro level, transport is not an end in itself, it acquires its meaning in the extent to which it allows needs to be satisfied or the desire to achieve other objectives.

At the macro level, according to Black et al. (2007: 139), transport usually takes place in a wider context to attain socio-economic objectives, such as respect for safety and security, protection of the environment, awareness of changes in the use of the territory, leading free lifestyles, and so forth. At the micro level, something similar happens. The use of transport by individuals and groups does not generally constitute a service which is a last resort, but a means that allows access to other goods, services or needs. In this context, it is worth highlighting the enormous influence of transport in the development of a country. Thus, economic growth and transport are closely linked, especially since the introduction of the privatisation policy during the 90s.

2.1. CONCEPT OF ACCESSIBILITY.

In this sense, "accessibility" which, in its widest sense, should be conceived of in its dual dimension – (i) access to the place where the transport system is located, and (ii) accessibility to the transport itself – has special relevance. Both dimensions are taken into account socially by potential users when they have to choose between the different transport systems and when they have to plan journeys. Therefore, users' attitudes towards urban transport condition its implementation, as can be deduced from this research.

It was Hansen (1959) who introduced the concept as "the potential of opportunities for interaction". Since that moment, multiple definitions of the concept have been de-

¹ To access or reach the place or service.

² Characteristic or prerequisite for basic use, even when it has been reached.

veloped, and considerable in-depth research has been undertaken on different aspects of accessibility, including territorial planning and spatial interaction. As Juncá Ubierna (2002) asserts: “when we talk about accessibility we have to take into account people’s diversity. There is no normalised and single type of human being, but a wide mosaic of differences that constitutes us as we are. So the relationship of every person with the environment is different, and it explains specific characteristics that should be taken into account when setting out the universal design”. With regards to urban barriers, the concept of universal accessibility emerges. It should also be noted that “a good accessibility is the one that exists, but goes unnoticed by most users, except, obviously, by people with serious problems of mobility and/or sensory, visual and/or hearing limitations” (Rovira-Beleta, 2003: 34).

Universal accessibility and design should be conceived as a transverse policy that must necessarily involve different services, products, environments and systems, including the transport system. To achieve this, we deem that three key requisites have to merge: the development of an efficient regulatory framework, political stimulus, principally motivated by social consciousness, and technical progress and procedure.

2.2. THE CASE OF SPAIN

The case of Spain stands out because, since the mid-80s, and supported by European funds, it has made a considerable effort to overcome its deficiencies in transport infrastructures. Between late 80s and mid-90s it was placed, together with Germany, in first position in the European Union in terms of the percentage of GDP allocated for investment in transport infrastructures, doubling its average investment of the European Union (Strategic Infrastructure and Transport Plan, 2005).

The Treaty Establishing the European Community (art. 6) establishes the following mandate: transport must include sustainable development principles; in this sense, the Sectorial Integration Strategy — Council of Ministers, October 1999 — and the European Sustainable Development Strategy — Gothenburg European Council, 2001 — establish that:

“A sustainable transport policy should tackle rising volumes of traffic and levels of congestion, noise and pollution and encourage the use of environment-friendly modes of transport as well as the full internationalisation of social and environmental costs (...). Action is needed to bring about a significant decoupling of transport growth and GDP growth”.

2.3. THE TRAMWAY SYSTEM IN JAÉN

First trams were launched- horse drawn- in United States in the 19th century. The tramway system, as a public means of transport, reached its peak in the 50s and 60s, but was later relegated because of the massive use of private cars, which eventually dominated cities to a surprising

extent. Therefore, according to a comparative study between different European transport practices and policies, examples of tramway network in Nantes, Grenoble and Strasbourg (France), or the S-Bahn in Zurich and Berne in Switzerland, urban road traffic has not been reduced (Guidéz, 2000). It is only noticeable a levelling off daily car usage in those urban districts where parking restrictions have been implemented in a robust way (Pharoah y Apel, 1995).

Focusing on Europe, France is one of the European countries more affected by this form of urban and inter-urban means of transport, considered as a *transport tool*. De la Héronnière (2012) asserts that the tram system, as a clean, safe and comfortable means of transport, is attracting an increasing number of European cities, being 5% the predicted annual growth rate of the tram market.

Moreover, during the 58th World Congress of the International Association of Public Transport (UITP), held in Vienna in 2009 under the title: ‘Public transport: Making the right mobility choices’, Laurent Dauby pointed out that the challenge was “to double the amount of public transport in the world by the year 2015”, and was confident that the international resurgence of the tramway would achieve that.

So, some cities, including Jaén, have opted for the recovery of the tramway system, but by making it modernized and adapted to different needs. In short, thanks to technological advances, the old tramways have been transformed into a new means of public transport with a high level of performance, being accessible, noiseless, fast, regular, comfortable and ecological.

The Tramway of Jaén (Spain) is a metropolitan light train line that connects the centre of the city with the north. Construction work started in April 2009, and the commercial tramway service has not yet begun, although there have been two intermittent periods of tramway operation for testing purposes³. This tramway system runs entirely on the surface and has 10 stations, passing through the city’s main streets to reach industrial and business areas, as well as other points of interest.

The construction cost of this railway infrastructure amounted to EUR 74.8 million and was carried out by a consortium consisting of Alstom, Gea21, Ghenova, Inabensa, Mipelsa and Pavimentaciones Morales. It involved considerable reorganisation of traffic in main avenues and city areas, a redevelopment in the areas where the tramway runs, as well as a new configuration for the urban bus routes. The tramways were bought from the French company Alstom (De la Fuente, 2011).

3. METHODOLOGY

INSTRUMENT

To discover the social impact of implementing the Tramway System Project in Jaén, we observed the attitudes

³ First testing period: May 2011 (starting and stopping in the same month) Second testing period: June 2012.

towards this system and its operative framework of influence, using a quantitative methodology through a survey. We performed a multiple-stage stratified random sampling with proportional affixation on the census sections of the city, corresponding to those areas affected by the tramway system construction works.

Survey is directed to people who live in the areas affected by the tramway construction work. However the questionnaire focused exclusively on family homes with one or more members in a situation of lack of personal autonomy. To do this, we applied a filter in the surveys to select the focus group.

(Level 1): Those family units with one or more members in a situation of lack of personal autonomy : a person over 65 years old, people with any kind of disability (temporary or permanent) or with any condition that results in a lack of personal mobility (pregnancy, convalescence, pushchairs, etc.). In those cases, the survey was focused on the affected person.

(Level 2): Those family units whose relational level requires accessibility in their environment because they have a level 1 relative in their family or social network system who frequently visits (at least once a week) any member of the main family unit.

On the other hand, the city is divided into 7 strata (Figure 1)

FIGURE 1. STRATA



Surveys were conducted in homes based on whether they belonged to level 1 or 2, and the survey was addressed to the head of the family (a person who normally lives in that house and who is considered as the head of the family by the members of the household).

PARTICIPANTS

The sampling size was 600 surveys with a confidence level of 95.5% and a maximum acceptable error of 3.9%. Focusing on sociodemographic characteristics of the sample, 64.7% of the polled people were women, against 35.3% of men. With regard to work situation, 64.2% of those polled were inactive, 30.3% were working and only

5.5% were unemployed. The average age of those polled was 69.33 years and the trend being 65 years old, because older people were the subject of this study.

From the polled people who live in the areas affected by the tramway construction work, 71.8% belong to level 1 and 28.2% to level 2.

4. ANALYSIS

4.1. DESCRIPTIVE ANALYSIS

This analysis consists of an individualised study of the variables identified in the questionnaire, which provides a clear idea of the information available in the database. Most variables that form the survey are qualitative, so we conducted an analysis of the total surveyed population and strata (roadmaps). Moreover, dispersion and centralisation measures have been calculated in the case of quantitative variables.

This analysis addresses 4 key issues:

- 1) Socio-demographic characteristics of the sample.
- 2) Differences between strata.
- 3) Mobility difficulties.
- 4) Opinion of the current situation related to the tramway system.

4.1.1. SOCIO-DEMOGRAPHIC CHARACTERISTICS

In the descriptive analysis, the most significant results are related to the differences between strata. However, before analysing these differences, some socio-demographic characteristics have been identified, which reflect the global situation of people surveyed and also provide interesting information about the mobility needs of the sample, amongst others.

Of all the interviewed people, 52.9% have a physical disability. Similarly, a high percentage of these people need specific technical help for mobility (64.4%). Among them, we can highlight that 28.81% of them use a walking stick, 18.6% use crutches, 11.86% use walking frames and 40.78% use wheelchairs.

With regard to the disability level, in 89.2% of cases it was a permanent disability, with the significant detail that only 40.9% of them were receiving benefits and assistance, and only 20.4% of them belonged to any association.

As regards to the kind of household, the predominant type (43.8%) was composed of a couple and one or more dependent children, followed by couples without dependent children (30.3%). With regard to the distribution of types of home by strata, there is a connection between it and the different tramway routes.

Finally, the average annual income of the polled people was € 22,726.44, with a predominance of an average standard of living in 65.5% of households.

Among the polled population who stated that they received some kind of assistance or financial aid, the most fre-

quent kinds were assistance for old age, retirement (78.20%), widowhood, orphanage, or assistance for the benefit of relatives (15.26%) and for unemployment, employment promotion or professional training (6.54%).

4.1.2. DIFFERENCES BETWEEN STRATA

The descriptive analysis of the society living near the tramway route shows that there is a clear differentiation according to the stratum type.

It is worth highlighting that there was a higher percentage of people older than 65 years old at the beginning of the route (strata 1-3), compared with the number of people between 31 and 50 years old, who were more present on the remainder of the route (strata 4-7).

With regard to people belonging to level 1 and 2, disaggregating data by strata, there is association between variables using divergent χ^2

Association between variables: Divergent χ^2 \square p -value= 0.000. Association exists.

Differences between strata can be observed in tables below. People surveyed in 1-3 strata (tram ride start), belong to level 1 in a high percentage, which decrease progressively in strata 4 to 7.

TABLE 1. POPULATION BELONGING TO LEVEL 1 BY STRATA

	Yes	No
Strata 1	91.1	8.9
Strata 2	97.1	2.9
Strata 3	96.0	4.0
Strata 4	69.0	31.0
Strata 5	62.0	38.0
Strata 6	55.8	44.2
Strata 7	50.7	49.5
Total	71.7	28.3

In those strata at the beginning of the route (e.1-e.3) we find lower incomes with a higher average age and households in which couples without children and single households predominate. The strata at the last stage of the route (e.4-e.6) correspond to urban areas inhabited by a young and active working population, with higher incomes and households composed of couples with one or more dependent children.

4.1.3. MOBILITY DIFFICULTIES

According to the survey's results, the first cause of lack of mobility is ageing. Seven out of ten people with a lack of mobility are over 65 years old and, of these, one is over 85 years old, which considerably highlights mobility problems caused by age, especially among those people who are in the age range 65-85. More specifically, the causes of this mobility difficulty are mostly those typical of old aged people, with 60.2% of people with mobility difficulties between 65 and 85 years old, and 9.1% over 85. These are followed by other relevant causes, such as, in order of representation: having to move a baby in a pushchair (19.1%), or difficulties resulting from physical disabilities (only 4.7%).

But we were not only interested, in this study, in knowing about the mobility difficulties of potential tramway users — we also tried to extend that knowledge towards the residents' social networks. So we tried to learn about the mobility difficulties of people who visit them at their own homes. In the streets at the beginning of the route (e.1-e.3), the principal cause of the mobility difficulty of visiting relatives is having to move with a pushchair. Next in order of difficulty are visits by older people. In the other strata there is a greater variety of causes, notably visits from elderly relatives, followed by the movement of babies in pushchairs, and the movement of people with physical disabilities.

Another interesting variable in our research was the frequency with which they are visited at their own homes. The results show that 49.0% of people who live in the tramway streets or adjacent streets receive visits from relatives

TABLE 2. TRAVEL TYPE AND MEANS OF TRANSPORT

	On foot	Own car	Bus	Taxi	Shared car	Adapted Transport Service	Ambulance	Official and company vehicles
Work	34.60%	54.20%	8.90%	1.10%	0	0	0	1.10%
Shopping	59.30%	32.50%	1.40%	0.40%	0	0.20%	0	0
Attending classes/courses	65.40%	24.30%	9.30%	0.90%	0	0	0	0
Health matters	63.10%	26.80%	4.40%	5.20%	0	0.40%	0.20%	0
Administrative matters	90.70%	6.00%	2.80%	0.50%	0	0	0	0
Leisure	74.40%	2.60%	1.20%	0.80%	0	0	0	0
Visits	50.80%	4.60%	5.60%	0.50%	0.50%	0	0	0
Citizen participation	90.40%	7.20%	2.10%	0	0	0	0	0.30%
Social attention	73.50%	2.20%	1.30%	0	0	0	0	0

with mobility difficulties once a week. Another point to be highlighted is that 79.1% of the polled people believe that their relatives have difficulties in reaching their homes.

The causes cited were connected with the construction works, particularly the difficulty in moving about on foot, which was due to the bad state of the pavements and the lack of signposting and alternative routes. They also highlighted other problems caused by traffic and the lack of parking places, which resulted in a decrease in the frequency with which these people visit them.

In this case, there are no significant differences between the different strata regarding the perception of the polled population on the difficulties experienced by their relatives in reaching their homes.

Once it has been demonstrated that the provision of a tramway system is needed for this kind of community, we shall proceed to show the characteristics of these people's itinerant mobility.

Owing to the fact that, in these areas, 52.5% of the polled population is over 65 years old, 70.5% state that they never travel. The reasons for travelling are, firstly, daily shopping, followed by travelling for working and leisure.

4.1.4. ATTITUDES TOWARDS A NEW MEANS OF TRANSPORT: IT ONLY JUST GETS THE PASS MARK

It is worth noting that tramway systems usually have the added value of connecting urban areas that are socially different, normally centre-outskirts. In this context, the trends that characterise the different strata and their homogeneity have made it easier to analytically connect the attitudes and needs of the citizens with this model of urban transport.

With regard to knowledge about the introduction of the tramway, 100% of the polled population was informed, because we are dealing with a small city, wherein construction work has a huge impact on the daily lives of the citizens. Hence, we insist on the need to carry out research into attitudes and satisfaction levels in relation to the new means of transport, prior to or in parallel with its introduction. Nevertheless, citizens take a critical stand, since the average level of satisfaction given to the project is 2.26 points out of 5 (the tramway only just gets the pass mark). More specifically, using Likert scale (1. Absolutely not satisfied; 5. Totally satisfied), the following results were obtained:

TABLE 3. SATISFACTION WITH THE TRAMWAY SYSTEM

Likert Scale	Frequency (number of interviewers)	Percentage
1	289	48.2%
2	68	11.3%
3	110	18.3%
4	65	10.8%
5	68	11.3%
Total	600	100%
Average value 2,26		

Among the advantages the tramway can offer, only three of them exceed the average value. Those advantages are speed, safety and comfort.

On the other hand, when we asked the citizens of Jaen if they are satisfied with the Tramway Project, the advantages implied by its start-up and the importance of creating a tramway in Jaén, there was a higher level of consensus in the "new" area (strata 1-3). These are precisely the areas which are composed of younger families and of a lower percentage of people in dependent situations or with reduced mobility compared with other, more central areas. Nevertheless, in these "new" areas one in two families have a member who has a lack of personal autonomy, and current or permanent situations that make their mobility difficult. These are the families that have a more positive attitude towards the opportunities provided by the tramway.

4.2. FACTORIAL ANALYSIS

In relation with the previous section, one of the purposes of this study was to know the behaviour of attitudes towards the new tramway system and to record instances of the difficulties and opportunities generated by this urban project, both in people in dependency situations and in their social and family networks. For this, we considered that it was very interesting to conduct a factorial analysis, with an overall aim to decrease or condense the information contained in a series of original variables into a smaller number of new dimensions or factors with the least possible loss of information. This analytical process served to discover the dispersion of attitudes of the citizens of Jaén towards the tramway.

Variables involved in the analysis were:

- Q. 15. Satisfaction with the implementation of the tram system.
- Q. 16. Tram advantages related to environment, traffic, noises, high speed, security, comfort beauty of the city, mobility improvement and accessibility.
- Q. 17. Influence of the tram in your personal life.
- Q. 19. Opinion about the current situation of Jaen (accessibility/inaccessibility).
- Q. 20. Evolution of Jaen in recent years in some specific matters: infrastructure, innovative projects, social services, public transport.

Beforehand, in order to have the opportunity of conducting a factorial analysis according to the statistical data, we carried out KMO and Barlett tests and correlations matrix study.

KMO and Barlett test	
KMO	0.905
χ^2	9230.428
gl	0.406
Sig.	0.000

Barlett test indicate null hypothesis (correlated variables) and KMO = 0.905, which points out that both are

successful, which shows that it was appropriate to do a factorial analysis.

The next step was to obtain the matrix of components, having selected only those values with high factorial charges (> 0.30).

4.2.1. SELECTED FACTORS SOCIAL IMPACT

After performing the factorial analysis, the programme, by the rule of Kaiser (which takes as many factors as there are 'eigenvalues' greater than 1), seven factors were selected. Because the seventh factor offers a very low percentage of explained variance, which makes it more difficult to reach conclusions, we reduced the number of factors to six, with 62.27% of applied variance.

These are the six factors:

- Factor 1: "Opportunities offered by the tramway". It is entirely composed of variables 16, 17 and 15.1.
- Factor 2: "Services 5 years ago". Composed of transport, infrastructures, projects and social services available 5 years ago.
- Factor 3: "Current services". Composed of transport, infrastructures, projects and social services available currently.
- Factor 4: "Accessibility 5 years ago". Composed of accessibility and inaccessibility variables in traffic matters in the city 5 years ago.
- Factor 5: "Cleanliness". Composed of variables relating to the image of Jaén with regard to cleanliness.
- Factor 6: "Current accessibility". Composed of accessibility and inaccessibility variables in traffic matters in the city currently.

5. CONCLUSIONS

5.1. INITIAL OBJECTIVES AND THE WAY TO ACHIEVE THEM

With this analysis we have tried to create an analytical picture of the context in which the tramway is being introduced. As in a medical implant, we think the "body" in which it is to be implanted should be previously analysed to predict its use, profitability and social impact.

Those objectives have been reached and this research allows having a real knowledge about the social contribution and social effects of the tramway system implementation in Jaén.

5.2. RESULTS

The city tramway system crosses different areas. This research shows that those newly constructed areas, with an emerging middle class, young, with children, and who are mainly affected by the tramway construction works in a more indirect manner. They perceive difficulties in the visits of elderly relatives or due to their lack of current mobility because they have to travel with a baby. Nevertheless,

the prime cause of lack of mobility, which is common to all areas, is ageing, because seven out of every ten people with a lack of mobility are over 65 years old and, of these, 1 is over 85 years old.

One of the main discoveries is that there are relevant differences between the strata, such that the polled people who live in the streets at the beginning of the tramway construction works belong to level 1 in a high percentage, which diminishes as we advance along the tramway route, where the number of people who belong to level 1 decreases. Consequently, differences in the attitudes and effects system between strata can be observed.

On the other hand, we may observe a high degree of sensitivity in those people who live next to any construction area in the city which prevents them from travelling to perform their daily tasks, and also, at a higher level, to be able to work normally or, in case of those over 65 years old, to integrate into the social life of the city with normality. Nevertheless, we believe that, logically, their work is not the most important reason for the itinerant movements of this group of people. 70.5% of them assert that they never travel for working purposes (kindly remember that 52.5% of polled people are over 65 years old), and most of the polled people travel especially to do daily shopping, followed by travel for work and leisure.

Social relationships are those which acquire the highest prominence in the areas affected by the tramway construction works and they are, at the same time, the worst affected. The polled people travel especially to do daily shopping, followed by travel for work and leisure. Once a week, 49.0% of people who live in tramway streets and adjacent streets receive visits from relatives who have some mobility difficulty. Similarly, 79.1% of the polled people believe that those relatives have difficulty in reaching their homes.

When asked about the time prior to the construction works, 84.1% of the polled people state that before the commencement of works they had no difficulties in walking in the street. Among the factors that are perceived as making this situation impossible, the following stand out: poor lighting, floor tiles, badly parked cars, shortage of pedestrian crossings, lack of ramps, dirtiness, unevenness and obstacles, signposting and water and drainage channelling.

As regards knowledge of the tramway, all the polled people knew about its introduction. Nevertheless, overall, it received an average mark of 2.26 out of 5, although the lowest marks were given by people who live in the oldest part of the city, and the highest ones by people who live in new areas where there is a younger population and, paradoxically, by those who suffer from fewer direct mobility problems. Those attitudes are based on a negative idea of progress and everything that entails a change in their daily life.

To sum up, when introducing a new means of transport, it is essential to take into account the attitudes of the social context where it will be introduced. A failure to consider opinions, citizens' needs and beliefs, significant facts, as well as their travelling and mobility needs, simply

jeopardizes the feasibility of a project with an important social, innovative and sustainable character which is for some people an immense leap in progress and, for others, merely a look back to the past.

6. BIBLIOGRAPHIC REFERENCES

- Black, W. R., Nijkamp, P. E. & Reggiani, A. (2007), "La investigación sobre el transporte a ambos lados del Atlántico: Estrategia y análisis", in Martín, Juan Carlos A. Reggiani, Aura & Rietveld, Piet (eds.), *Las Redes de Transporte desde Una Perspectiva Multidisciplinar*, Pamplona, Thomson-Civitas, pp. 127-149.
- Dauby, L. (2009), "Public transport: Making the right mobility choices", 58th World Congress of the International Association of Public Transport (UITP), Viena.
- De la Héronnière, L. (2012), *Full Speed ahead for the French Tram System*, Ministère des Affaires Étrangères, 33.
- De la Fuente, Y. M., Sotomayor, E & Escarabajal, M. A. (2011), *El Sistema Tranviario de Jaén: Modelo de Integración de las Personas en Situación de Dependencia en la Autonomía Personal*, Jaén, KND.
- Guidez, J.M. (2000), *Dix Ans de Mobilité en France: Les Années 1990*, Lyon, CERTU.
- Hansen, W. (1959), "How accessibility shapes land use", *Journal of the American Institute of Planners*, Vol. 25, pp. 73-76.
- Juncá-Ubierna (2002), *Accesibilidad Universal: Diseño sin Discriminación*, Madrid, Ministerio de Trabajo y Asuntos Sociales.
- Kaufmann, V. 2000, "Modal practices: From the rationales behind car and public transport use to coherent transport policies", *World Transport Policy & Practice*, vol. 6, n.º 3, pp. 8-17.
- Pharoah, T. & Apel, D. (1995), "Transport concepts in European cities", *Avebury Studies in Green Research*, Aldershot.
- Rovira-Beleta, E. (2003), *Libro Blanco de la Accesibilidad*, España, Ediciones UPC.
- Waldorf, B. y Pitfield, D. (2005), "The effects of demographic shifts on non-automobile transportation needs of the elderly", in Donaghy, K.; Poppelreuter, S.; Rudinger, G. (eds.), *Social dimensions of Sustainable Transport: Transatlantic Perspectives*, London, Ashgate, pp. 67-89.
- European Community Treaty*, 1992.
- Sectorial Integration Strategy*, Council of Ministers, 1999.
- European Sustainable Development Strategy*, Gothenburg European Council, 2001.