Implementation of soft mobility solutions on planning actions

Case study – Cascais

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EXTENDED ABSTRACT

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1. The cities

Cities, in their most westernized format, are where the avant-garde of modernity is found today, where great thoughts come from, where great economies emerge, where everything is more accessible and easier, and where the most effective value chains are concentrated. Therefore, cities are places with enormous attractiveness for the settlement of populations.

As a result of these developments, urban populations have grown considerably, and this trend is expected to continue. According to the 2014 United Nations report, in that year more people lived in cities than in rural areas, where 54% of the world's population already live. The same report recalls that in 1950, 30% of the world's population already lived in cities, and in 2050 it is expected to be 66% (ONU 2014:1). It is therefore urgent to discuss the challenges facing urban systems, namely to identify and bring to the table the relevant issues of current and future cities.

In addition, most of the cities we know today are the result of periods of unbridled development and expansion, based on unplanned processes and supported by the discretionary consumption of resources, which shaped them in the form of huge areas of metropolitan territory as we know them today, which have greatly increased the pressure on urban and terrestrial systems. It has become inevitable to discuss the challenges facing urban systems, identifying and debating the pertinent issues of current and future cities.

In its own scale and time, Portugal also went through a period in which models of common expansion and occupation compromised the shape and organization of its major cities. Nowadays, the general the notion is that the national territory will not have, in the short or even medium term, the abrupt growth witnessed in the second half of the twentieth century. Therefore planning will not have the model of urban expansion as a great concern, but rather the issues underlying their consolidated urban areas, thus giving priority to intervention over existing urban space. So the debate takes on the same form, given the strong legacies of the past.

2. Sustainable Development

According to this context, today's cities face major sustainability challenges. Strategies developed are not based solely on resource consumption but which model of urban organization mostly reduces the impact on terrestrial systems.

Amongst the communities of most conscious and mostly democratized westernized societies, it became a habit to seek a response to the problems that are common to them, especially those derived from their socio-economic context and their natural surroundings. In Europe, a good example of this movement has been the European Commission, with the publication of a documents series that establish a set of solutions aimed at mitigating these problems based on sustainable integrated policies. This institution has been pursuing one major objective: improving the environmental performance and quality of urban areas as a way to ensure an environment of healthy living for all European urban citizens. Also, the reinforcement

of the environmental contribution to sustainable urban development, with the inseparable social and economic issues is included in its strategy.

A significant part of the urban value chain includes transport and mobility, which also are an example of a community common problem, as the main sectors responsible for GHG emissions (accounting for 68% of national emissions). The transport sector, which is mostly made up of road traffic, is the sector that produces more emissions in Portugal (with 24% of total national emissions), and is also the fastest growing sector, around 57% between 1990 and 2014 (REA 2016). In this context, and within a framework of sustainable development, cities face major challenges to reverse mobility habits. The emphasis on soft, pedestrian and cycling modes is presented as the main alternative, and the call for its implementation is widely referenced in the guidelines of European Union policy for strategic actions related to the sustainable mobility.

At present, technological development is the phenomenon that brings the main innovations to most of the main sectors of society. It is also from its innovative contribution that solutions are sought for cities various problems, including the use of information and communication technologies.

3. Mobility

Mobility is an inseparable theme of the urban way. As cities develop, the needs of their inhabitants increase, and consequently the complexity of the trips they need to make, and associated goods. In this scenario, the automobiles, supported by seemingly unbeatable arguments, is the masses elected mean of transport, object to satisfy their personal needs, and gains a special preponderance when it becomes understood as the ultimate symbol of freedom.

In order to allow widespread use to the whole population, vast road infrastructure networks were implemented, which was thought to be the cities solution to mobility, but contrary to expectations, became the main cause of their traffic congestion. The phenomenon of growing global desire for the automobile, and abandonment of public transport, quickly makes its use unsustainable. However, the discussion it is not restricted to the means of transportation. Attempting to project itself in the future, within the new framework of requirements, the territorial problems resulting from an uncontrolled phenomenon of development and expansion are also one of the major challenges to mobility that municipalities are facing today.

This set of reasons gives the use of the car the responsibility for reducing the flow of people and goods in cities, the compromise of the functioning of the urban arterial system, and therefore the decrease of the quality of life.

In Portugal, local authorities, aligned with national and EU directives, and inspired by the best examples of success at European level, already have plans in place to reverse this scenario, namely through Sustainable Mobility Plans.

The basis of a multimodal chain system, that strongly benefits soft modes and in conjunction with a capable public transport system, is seen as the best solution, and will allow it to compete with the widespread monomodal use of the motorized individual transportation

modes. For that purpose it is necessary to embrace the challenge, involving all the actors of society (users, operators, political power), and make use of innovative mobility solutions.

The adoption of an urban mobility model allows the continuous improvement of travel conditions, the reduction of congestion, and represents the improvement of the environment and communities' quality of life.

4. The Soft Modes

The development of mobility by soft modes is associated with pedestrian and bicycle trips. There were times in which we observed the investment concentrated solely in road solutions, marginalizing other modalities of mobility as a consequence of the increase of average distance between destinations, combined with a set of obstacles created by this new urban configuration saw the abandon of soft modes as a solution for travel, even in a proximity urban mobility context.

However, all the problems related to urban congestion, pollution, noise, lack of parking, and the precariousness of urban environment, make us today see the presence of cars in a more undesirable way. It also begins to be seen that soft modes represent, in the current urban context, significant competitive advantages over the use of the car. It is widely known, that the practice of these modes of travel presupposes access to their direct benefits, such as improved health, energy savings, congestion reduction and reduction of air and noise pollution. In a less direct way, their use also results in a greater efficiency of the public transport system, in numerous economic and social advantages, and in the reduction of accidents and other associated risks to the populations.

This way, there arises the need to promote good conditions for pedestrians and cyclists, adoption of healthier lifestyles and a more efficient urban system, with greater proximity and accessibility and less harmful emissions (IMTT 2011:20). The growing number of good examples associated with the promotion of this type of mobility, which is felt a bit throughout all of Europe, is proof of the current demand for this type of solutions.

In the intended model, based on global directives, there is an accessible, safe, pleasant space with urban and human quality. It is thus possible to acquire a new culture of mobility capable of instilling new habits in urban movements, that is to say, this is how soft modes of mobility come to play a preponderant role. The paradigms of new cities also imply that part of the concern with urban mobility is transferred to the need to guarantee accessibility, namely, it is imperative to guarantee quality access to goods and services in the city. In this context, soft modes assume, today and always, a preponderant role. However, in our country, the choice of the bicycle as a mode of daily movement is practically non-existent and the number of pedestrian journeys is far below its real potential.

The implementation of soft modes includes the adoption of behaviors in favor of a sustainable mobility, which embodies the priorities of mobility policies and national and community transportation, which are summarized in the following points:

- "To value cycling and walking" as citizens' daily commuting practices, integrated

into the transport system and giving priority to criteria of sustainability, economic, environmental and social efficiency.

- Guiding urban public policies towards the goal of sustainable mobility, protecting public space and the health and well-being of citizens. (IMT 2012:3).

There is a need to reinforce these intentions in the planning process. To this end, the implementation of soft mobility should integrate the strategy of the urban planning process with the participation and mobilization of the territorial agents, based on an innovative spatial planning, supporting an efficient implementation of pedestrian and cycling modes of movement. The proposals have to articulate issues related to urban planning, to transports, based on a diversified multimodal system, imperatively contemplating soft modes, and integrating automobile management policies.

The proposals resulting from that process must involve strategies in the area of integrated mobility management, and not exclusively direct measures for the implementation of soft mobility infrastructures, but also others whose results will naturally create the choice for soft modes.

5. Planning Aid Instruments

The implementation of soft modes must be born from the integration of the concept in the planning actions. To this end, it will be necessary to use the appropriate support systems. The geographic information systems (GIS), is used as main tools of this study methodological system. In a context in which technological innovations revolutionize processes in the various sectors of city management, in the planning of the territory, it is through the latest GIS software that new work methodologies are adopted and new horizons are established. These innovative methodologies allow us to include the complexity of new territory variables, such as sustainability and quality of life associated with mobility.

These tools introduce greater scientific support (measuring, quantifying, qualifying) into planning, and thus allow for better decisions, which include mobility planning, and hence the implementation of soft modes.

The use of GIS represents also a valuable contribution to the processing and calculation of information relevant to the construction of indicators. A system of mobility indicators should be able to identify existing opportunities and shortcomings and monitor the implementation planning process and evaluate proposed solutions.

6. Methodology for the implementation of Soft Modes

It is proposed in this study the development of a methodology for the implementation of soft mobility solutions integrated during the planning actions. The application of this methodology allows the support of the realization, or evaluation, of territorial management instruments of municipal scope, namely Municipal Master Plans, Mobility Plans, Urbanization

Plans, or other documents of the same nature. It can also complement existing studies, valuing and sustaining existing solutions.

The methodological process reflects the specific needs of the studied territory, and the implementation of the strategic guidelines presented by the current local power, which in turn converge with the global community strategic guidelines:

"• The promotion of spatial planning strategies that reduce the need for mobility and allow the creation of alternatives (particularly in TP) to individual motorized transport;

• The promotion of interconnected and complementary systems of collective transport, pedestrian networks and bicycle paths;

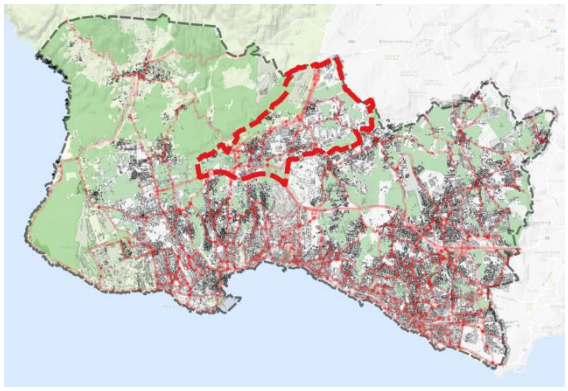
• The promotion of a more rational use of the private car, either by encouraging its shared use or by changing rules and driving habits. "(APA 2010:20)

The developed methodology allows the application to different case studies, and reflects the particularities of their different territorial contexts. It represents a simplified process of analysis, and allows to process complex data and to materialize proposals supported in recognized solutions (good practices).

The studies contemplated in the development of the methodology make use of the GIS technology, as a tool of analysis and data processing. They also support the consultation of existing documents, as plans and studies, of municipal scope.

7. Methodology Application – Cascais case study

In an early phase, and according to the recommendations established by the methodology, the analysis and characterization of the state of the county of Cascais is carried out using an existing document and study research process, which identifies needs and the feasibility of the implementation of soft modes. This preliminary procedure results in the identification of zones with mobility problems, and an area of the county (AI) is selected for the development of the methodological process.



This is followed by the diagnostic phase, which seeks to understand the territory, the general mechanisms of displacement and their synergies, the various aspects of AI, public space, demography and social fabric, and economic aspects.

In order to determine the conditions under which the solutions for the implementation of soft modes will be developed, 4 key aspects are considered and diagnosed:

a) **Natural conditions**, Good conditions are identified from the point of view of their physical territorial morphology (distances and inclinations). Global conditions reveal considerable potential for the implementation of soft modes of mobility.

b) **Demographic conditions**, Three nuclei of demographic concentration were identified and circumscribed, corresponding to three urban clusters in the AI perimeter respectively.

c) **Road network**, Well served by a diversified road network at the five distinct levels; in general it is well understood by its users, although there are some penalties in the case of routes of the lowest hierarchical level. The urban cycling network is still non-existent, and the pedestrian network is characterized by the evident disregard and marginalization of its infrastructures, with the presence of barriers and discontinuities.

d) **Urban functions**, AI is currently characterized by a lack of TP supply, this function being exclusively attributed to a road TP operation. The study area is relatively well served by a diversified equipment network, whose cycling accessibility is guaranteed to the full extent of the AI. It is considered necessary to improve the continuity between different sections of the pedestrian network, in order to establish more direct links to the main poles of attraction.

Solution Definition:

The objectives established for the study define the set of measures to be adopted. For the implementation of the soft modes, the following solutions were selected:

1) Make housing occupation more compact;
2) Improve the modal split of compulsory travel in favor of alternative transport and soft modes;
3) Increase the frequency of the regular rebate TP to the train;
4) Improve access to schools, employment, and collective equipment;
5) Reconfigure the road network and the local public space in terms of safety and comfort;

Regarding the diagnosis made in the study development, and respecting a hierarchy of decision, resulted the following set of solutions:

- **Urban Compaction**
- **Cyclable infrastructure development**
- **Requalification of pedestrian network and public space**
- **Structuring of the AI, through the implementation of a soft modes network**
- **Implementation of “30 Areas”**
- **Change parking policies**

The final proposal – Cascais:

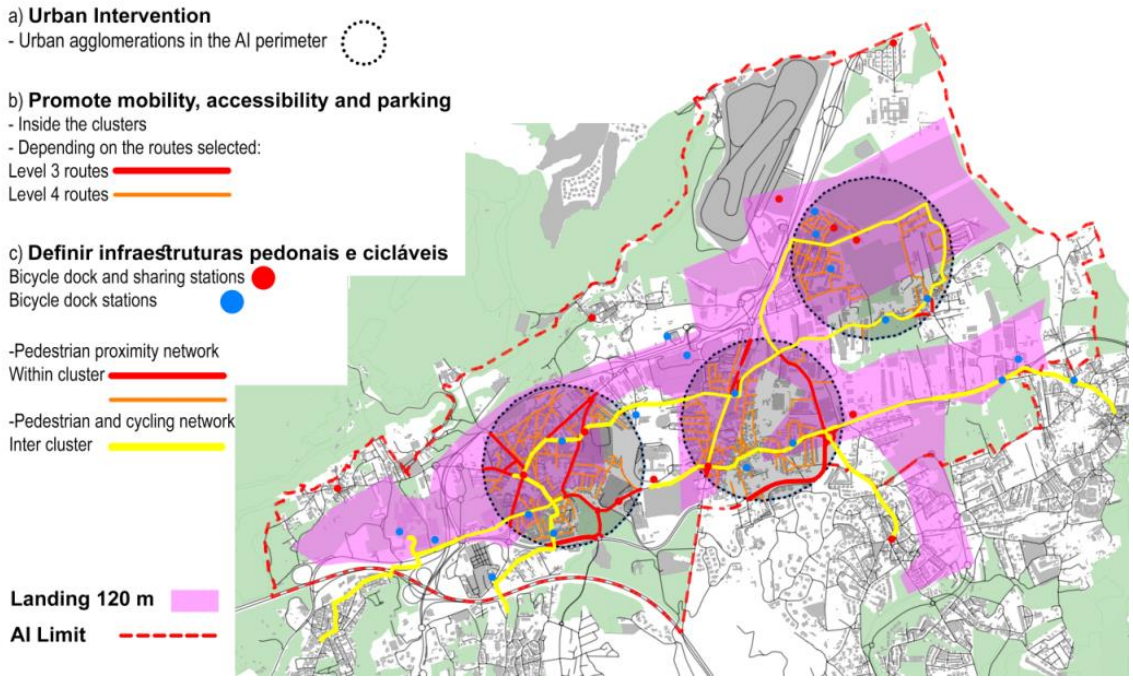
In the three focal points identified at the limits of AI (Alcabideche Center, Alcoitão, Adroana Neighbourhood), was identified the need to promote integrated projects that highlight the public and social space, resulting from a continuous structure of free spaces and the proposal of collective equipment, as well as bet on the consolidation with infrastructures for areas proposed uses, namely:

a) **Urban Intervention:** Promote structured programming consolidation of urban areas and containment of dispersed building phenomenon and diffuse urbanization.

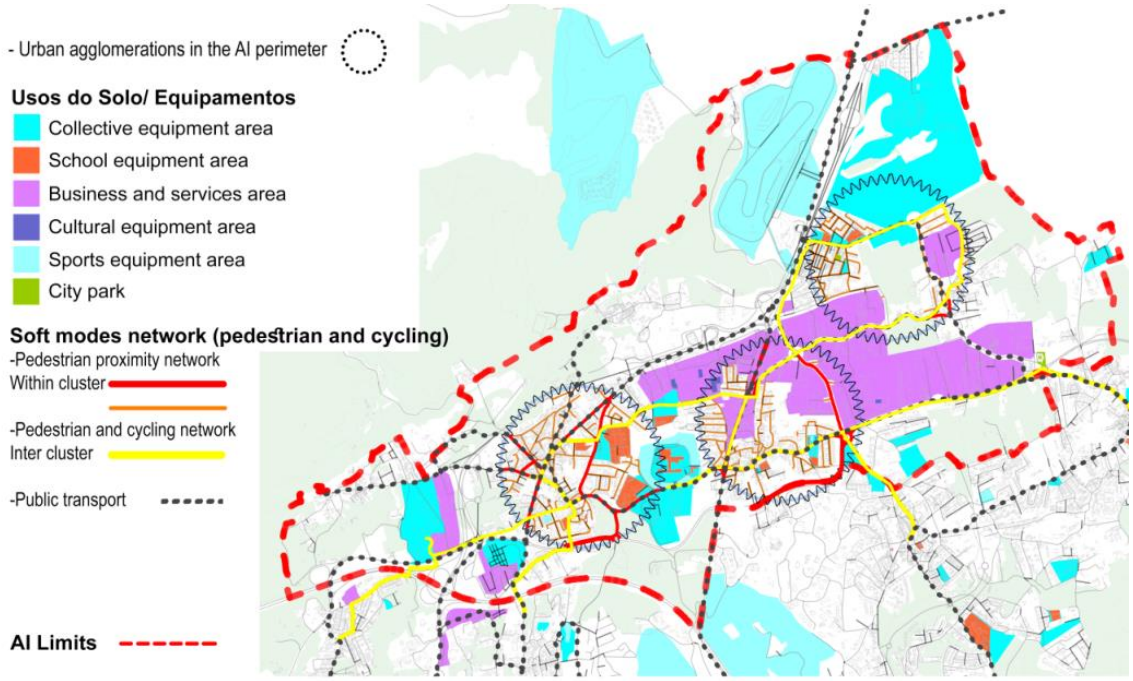
b) **Promote mobility, accessibility and parking:** Creation of a hierarchical network that is secure, coherent, direct, attractive and comfortable.

c) **Define, quantify and locate pedestrian and cycling infrastructures:** Ensuring equity in access to infrastructures, collective equipments and services of general interest (education, health, employment). Promote the qualification and expansion of the structuring pedestrian and cycle network, contemplating the intervention zones for the development of actions, aimed at improving pedestrian and cycling accessibility.

Proposal (graphical piece) - Implementation plan for structural soft modes of mobility network, on the identified plateau.



Proposal (graphical piece)- Implementation plan for a structuring network of soft modes in the AI, in articulation with the public transport network, with urban clusters (demand), and collective use equipment spaces (supply).



8. Conclusions and future developments

For a long time in Portugal, soft mobility has played a marginal role in mobility and transport planning, as evidenced by the low values presented by the mobility associated indicator matrix. The positive results of some good examples of soft modes implementation are already being felt.

It is concluded that infra-structuring is certainly important, but must be accompanied by other solutions that do opt for the soft modes.

At this point, Portugal is still quite late, with special focus on areas where the occupation is dispersed, and where the implementation of a competitive multimodal integrated system (able to reverse the trend of individual transport use) is difficult to achieve. However we need to embrace the challenge, make use of innovative systems, and involve all actors of society to jointly make it possible to achieve better solutions for the benefit of all.

The implementation of soft mobility networks should be part of a process of in-depth reflection on the global travel system, and it is up to the local authorities, the key link in a decision-making chain, to plan and ensure the best solutions for the implementation of soft mobility modes. These solutions should reflect the needs and characteristics of the territory context they manage, depending on their population. The phenomenon of technological development is constantly reinforcing the set of tools to help this process, which has led to more sustained and effective solutions. On the other hand, the same phenomenon can, in the short

term, be responsible for a revolution in the general bases on which current mobility solutions are processed. We must follow the latest technological innovations related to the field of mobility and transport, and include reflection on the implementation of the most likely scenarios resulting from the impact of these innovations.

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