

## **The new Azores Regional Plan as a tool to regulate the sprawled growth in the insular Portuguese territory**

### **Introduction**

Without a coherent shape, in the traditional sense of a form with clearly defined borders (distinguishing urban perimeters and rural/natural boundaries), the urban sprawled growth is not a problem suitable to a simple definition or delimitation (Stern and Marsh 1997) since it is a mostly complex question related to the specificity of each urban area (Carruthers and Ulfarsson 2002).

Generally, urban sprawl is ascribed as a mainly negative phenomenon, therefore, many ways to mitigate its negative effects over the city are proposed by many studies. Of course, the evaluation of this phenomenon has to be directly related with the type and dimension of the city; the phenomenon will reach different shapes whether it is related to a big city in a developing or a developed country, for instance.

It is although important to bear in mind that this is a non concluded debate and that, thus, there are many arguments and counter-arguments on its “negativity”. Many positive aspects of urban sprawl are indeed pointed out (such as, i.e., a bigger proximity to free rural/natural space or low density housing areas) sometimes even suggesting that this pattern of urban growth is as valid as the compact one. The Ebenezer Howard’s Garden City, as an example of an urban expansion model, can illustrate how although a specific social, economic and/or political local context might demand more expansive suburban development patterns, that does not constitute a threat to the people’s satisfaction, neither to the application of a qualified urban design.

This paper aims to show how the principles of the cities’ spaces regeneration, diversification and densification can be taken into action through urban planning and, more specifically, through the Azores Regional Plan, by promoting a balance between urban renewal and urban expansion.

Assuming that urban sprawl has more negative than positive aspects, it is intended to show how it can be controlled not throughout a radical set of measures, but by a balanced thought about a specific local urban demand to grow and “how” and “where” that urban settlement can grow. It is not a question of forbidding or limiting urban expansion but rather to look for new scenarios where urban grow may find its placement, i.e. by facing it to urban renewal, through the occupation of vacant spaces and buildings within the cities centres as a plausible and enjoyable alternative.

According to many authors, at least the main problems related to this phenomenon have been already approached, understood and classified. It is now needed to assume it and to give them an efficient response. But how can this be done? The response might be found in the idea that, either by attributing new functions to the void spaces within the city centre, either to the suburban free spaces, the most important thing to change regarding the urban sprawl control, are the «... *rules of the game*’ of local economic development, in order to increase the interest of local government in concentrated development and in the preservation of open space» (Razin 1998). In this context, urban planning plays a very important role.

The new Azores Regional Plan illustrates how that role can be taken into action, by considering in its orientations some measures to control urban sprawled growth in the Azores territory.

### **Urban planning and sprawled growth**

In this paper’s context, assuming that urban sprawl is mostly a negative phenomenon, urban sprawl can be defined as a *particular shape, spatially unlimited, of urban growth* (Downs 1999), characterized by a *low density development pattern* (Carruthers and Ulfarsson 2002) and presenting as main problems the *traffic congestion, massive absorption of free space,*

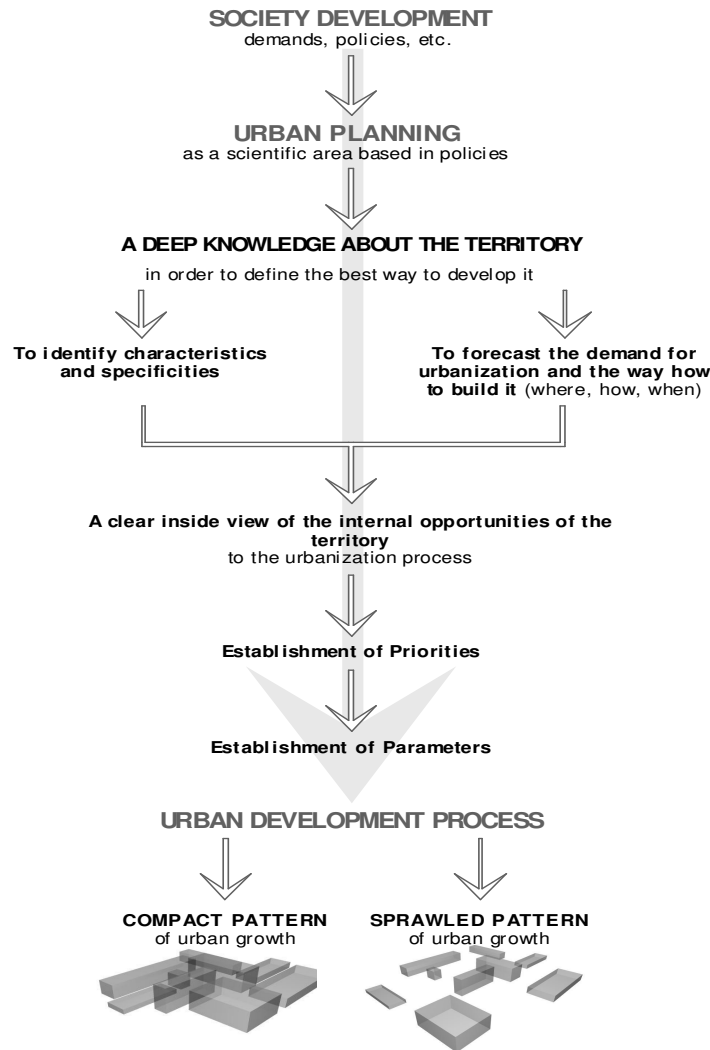
*inadequate infrastructures and services, low quality in housing and in public schools, as well as bureaucratic dysfunctions and lack of financial resources* (Downs 1999).

There exist many possible explanations to urban sprawl, such as the people's choices (privates) or the public policies as, i.e., the clustering ones. In fact, for instance, the arising demand for a closer relationship between house and nature presents serious consequences to urban sprawl for it contributes «...to exurban sprawl into agricultural areas...» (Lucy and Phillips 1997). In the same way, the clustering policy, although firstly might seem a way of controlling urban sprawl by pre-defining land-uses, can be seen, as it comprehends the preservation of open space, a way of altering «*the evolution of development patterns not only because they create an area in which development cannot occur, but also because they may create areas that attract neighbouring development*» (Irwin and Bockstael 2004).

It is important, therefore, to bear in mind that urban sprawl is not a consequence of urban development itself. It is rather the consequence of the way how that development is conceived and applied. Consequently one cannot say that urban sprawl is the responsible for all the contemporary urban problems but, yes, the general basis of the contemporary society's development (such as political fragmentation) which is, in fact, the cause of many other urban pathologies, such as the gentrification phenomenon or the cities centres decline process. Urban sprawl is just one of those pathologies.

To think on an urban development based in more compact principles, through urban planning, could represent a strong solution to control the urban sprawled growth, contributing also to less additional economical (i.e., on the creation/extension of infrastructures), social (i.e. social inclusion) and environmental (i.e., preservation of regional/local ecological features) costs.

Urban planning, as a scientific area based in political options and values will, therefore, influence the way how the urban development is processed, defining how these questions are considered and transposed to specific urban development parameters. It is crucial, considering this, to have a deep knowledge about the territory either by identifying its characteristics, either by forecasting the demand for urbanization and the best way and moment to promote it. In the end, it will be possible to understand which are the opportunities presented by the territory to the urbanization process and, consequently, to establish development priorities and parameters towards a more compact or sprawled pattern of urban growth, depending on the local demand, such as the following figure suggests.



**Figure 1 – Urban planning and development policies.**  
**Source: João G. Cortesão.**

Furthermore, density and dispersion are nothing but measurement items. What effectively attributes a cohesion degree to an urban territory is, besides its social characteristics and urban drawing (Llewelyn-Davies 2000), the way how the urban policies are structured over a certain development logic, where, contemporarily, economy plays, mostly, the major role.

When the control of the urban growth over free areas in the rural/natural fringe is aimed, before thinking and planning about urban expansion, one should think about the regeneration of free spaces, built or non built, within the cities' centres (among other intervention levels such as society, culture or economy); one should analyse which opportunities exist in those areas that could ensure the urban development without necessarily and automatically think about urban expansion.

Finally, it is important that urban planning consider urban sprawl as a phenomenon within which many different urban scales and areas come forward (Sultana, Weber et al. 2007). In this context, and as far as this paper is concerned, sprawl «...cannot be identified as a type of urban form, but is instead an urban ranking (like congestion, quality of life, or cost of living)» reason why urban planning must work on the «...ability to actually map out sprawling areas within a metropolitan area» (Sultana, Weber et al. 2007). This idea is on the basis of the aforementioned

knowledge about the territory through identifying its characteristics and forecasting the demand for urbanization.

### ***Urban sprawl in Portugal***

In a general way, the sprawled growth in Portugal is related to the phenomenon of urban expansion over rural areas around the main urban settlement. According to this, the distinctive contrast between both landscapes (urban and rural) has given place to a «...*transformed "hybrid form" of region vulnerable to urban encroachment...*», that transcends «...*traditional political boundaries of cities*», such as Mookherjee, Hoerauf et al. (Mookherjee, Hoerauf et al. 2006) argument in the global context of cities. The relation between the two landscapes has been processed in quite a chaotic way, leading to a so mixed land-use, that especially in suburban areas, space has become neither urban, neither rural, spilling and fading the urban settlement into the open rural/natural space.

Basically, the Portuguese urban development follows the general same headlines than that from other Mediterranean cities, of southern Europe, characterized especially by «...*the appearance of new urban centralities, in zones once considered as being on the fringe of the processes of urbanization*» (Munoz 2003) as a consequence of a fast and intense metropolization process.

Apparently, because it intensifies the flows of people, goods and information, this would seem to be a harmless situation. But the fact is that this development logic induces to larger *arcs of mobility* and to «...*growing numbers of people involved in these movements...*» (Munoz 2003). This means on one hand, that there is a bigger distance between centralities which need to be carried out by car, increasing the CO2 emissions into the atmosphere; and, on the other hand, the development of new forms of habitation, therefore urbanization, generally related to low-density housing typologies spread-out in the territory, such as detached terrace-houses and semidetached houses (Munoz 2003). All this situation has subsumed, functionally and morphologically, «...*the traditional Mediterranean model of the dense and compact city (...) into more diffuse urban sprawl...*» (Munoz 2003) that, in this paper's context (considering the aforementioned assumption that urban sprawl has more negative than positive aspects), means a more uncontrolled and undesirable growth pattern.

In the Portuguese territory, this situation was materialized in a general inability to ally the new and pre-existent urban fabrics, leading to a serious "spatial dilapidation" phenomenon (Távora 2006), which can be illustrated clearly by the example of the Ave valley. This area located in northern continental Portugal, by having a sprawled distribution of housing (many times with an auto-promotional genesis) and job places nearby the water lines and the main communication roads, presents tensions between the built and the free space that will determine, eventhough being composed by several small scale urban centres, a lack of centrality definition into this area (Domingues 1992).

Considering the aforementioned, it can be said that Portugal, as a Mediterranean country, knows a "new" urban development pattern that is «...*clearly anti-ecological and even more unsustainable than the model of the dense and compact city...*» (Munoz 2003), defining not only an environmentally and economically unsustainable urbanization process, but also other socially and culturally unsustainable situations.

Chaotic suburban areas, cities centres desertification, excessive expansion of infrastructures, dependence on the private vehicle and social inequalities, like gentrification, lack of place attachment, unqualified public spaces, among others, appear, therefore, as some of the main consequences of sprawled growth in Portugal. These, have led to a municipal space defined generally by a built continuum, structured by transportations (specially private), which promotes a so expressive sprawled urbanization into rural areas, that the separation between the major dimension nucleuses is faded (Alves 2001). A clear example of this situation is the Porto's city,

which by having a strong attraction power over the Northern region of Portugal and face to the dispersion of the mainly rural local settlements, has assembled a set of peripheral nucleuses in its urban expansion (Caetano, Monteiro et al. 1999). Consequently, once entering into the Porto's metropolitan territory, one cannot find, generally, any free space between the major urban centres deriving in two possible scenarios: either a high density urban environment, either the aforementioned hybrid form neither urban, neither rural.

A possible main cause for this situation might be the absence of an efficient and operative legal framework in the last decades, which has enhanced the stand out of undefined acts that, when in the hands of promoters with lesser ethical sense, have given place to the denominated "clandestine" operations, specially around the present Lisbon metropolitan area (Amado 2005). A strong legal framework orientated to the control of the urban development, might have been able to avoid this situation, especially through the management of the housing market (relation offer/demand), which is in the basis of the major part of the urban sprawl problems.

## **The new Azores Regional Plan**

### **Framework**

Nowadays, the structure of Portuguese Planning System for the continental territory and for the insular territory of the Azores and Madeira archipelagos is composed by a National Plan – the PNPT, which aims *to concretize the national strategy for the management, development and territorial cohesion*, working as the *reference framework for the development of a set of territorial management instruments that intervene in more restricted thematic and geographical domains* (Ministério do Ambiente 2007); by a set of regional plans so called - PROT - and also by the municipal plans - PMOT, at a bigger work scale. While the PROT depends on the Government's initiative and management, the PMOT is developed by Municipalities Technical Departments and have to be approved by the Government, after getting the Municipal Assembly's approval.

As the new Azores Regional Plan constitutes a PROT, it is important to refer that this sort of plan is a legal instrument to develop regionally the main *principles, objectives and directions consecrated in the PNPT* as the same time that constitutes a *long term strategic reference framework* for lower scale plans, such as the PMOT's or the *Municipal Masterplans* (Ministério do Ambiente 2007). Thus, they are based on a balance between strategic planning, sectorial interventions and the regulations for the soil use, occupation and transformation in order to be *sufficiently precise to be efficient (and its efficiency is measured especially by the way how it orientates the PMOT's), without however entering in specifications of regulation character* (Ministério do Ambiente 2005).

From all the PNPT's development orientations, the *Strategic Objective 3* is the one more clearly related to the control of sprawled urban growth by promoting *the polycentric development of the territories and by reinforcing the support infrastructures to the territorial integration and cohesion* (Ministério do Ambiente 2007). More specifically, this objective aims to *reinforce the region's structuring urban centres; to structure and develop the infrastructures nets of support to the accessibility and to the mobility, favouring the consolidation of new urban centralities and more polycentric urban systems; to oppose the sprawled construction, to structure the diffuse urbanization and to stimulate the reinforcement of intra-urban centralities; to promote an integrated development of the low density and rural territories adjusted to its diversity* (Ministério do Ambiente 2007).

Therefore, the new Azores Regional Plan, far behind of being a mere set of general principles, aims to have an efficient but flexible character. This objective is achieved, firstly, through a complete diagnosis of the territory, which is crucial to its deep knowledge, namely by identifying its characteristics, specificities, demands and dynamics; Secondly, through the way how the urban development processes were evaluated and forecasted, by confronting the demand and

the offer for urban growth, especially in what concerns to the housing market, and developing a methodology for the necessities gauging, which is fundamental to achieve a balance between urban renewal and urban expansion; Thirdly, through a set of urban growth principles based on the planning processes and its qualities, rather than in the imposition of reference parameters, which will allow to have a bigger flexibility to, in one hand, adapt the Plan to the regional development necessities and, on the other hand, to the subsequent plans to choose, according to the local necessities and characteristics, between urban expansion or renewal as the keyword for its urban growth process.

### ***Structural characterization of the Azores territory***



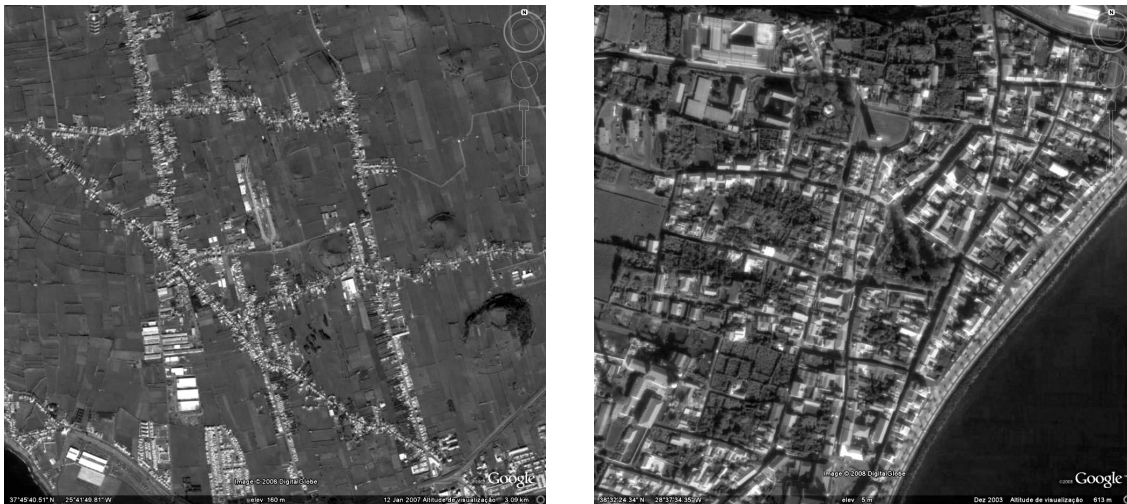
**Figure 2 - Geographical location of the Azores archipelago.**  
**Source: João G. Cortesão.**

The Azores archipelago is an Autonomous Region of Portugal, located in the Atlantic Ocean and it is composed of nine volcanic islands, disposed in the northwest-southeast direction.

The urban occupation in this archipelago was structured over two main aspects: the islands biophysics/climatic structure and the historical influence of the settlement processes. Relatively to the first aspect, the geological origin of the islands induced, considering some exceptions, in an altimetric profile characterised by cliffs or more gentle slopes, but that rapidly reach very high altitudes. The bioclimatic conditioning that high altitudes produce in the adaptation of the vegetal species and in the environmental comfort, leads to an obvious concentration of the urban settlements in the lower platforms under the 350m. Above this altitude the usual levels of rain and fog present constraints to the agricultural exploitation, with the exception of pastures. This is the reason why one always finds, in the majority of this archipelago's islands, an urban occupation concentrated in the seacoast fringes, and an interior territory, of altitudes above the 350m, which is mostly desert.

Relatively to the second aspect, the colonist character of the settlement has given place to a parcelling process of the territory with agricultural aptitudes, structured by the communication roads. This fact is associated to a built occupation structured, generally, nearby the roads, resulting on spread out linear agglomerations (figure 3). This pattern identifies the mainly sprawled growth in the Azores territory. In parallel, the dependency on the sea as a privileged

communication way in the historical process of colonization, leaded to the human settlements establishment in the seacoast areas with better conditions to provide shelter to the harbours. Because in these places the activities profile is diversified, namely through the concentration of administrative and commercial activities as well as services, leaded, in some cases, to the creation of a set of agglomerations with a more compact character and a bigger dimension relatively to the linear agglomeration pattern. These compact nucleuses (figure 4) are morphologically characterized by an urban tissue of small dimension streets that, although with an organic structure, suggests an orthogonal shape.



**Figure 3 and 4 – Linear sprawled in Ponta Delgada (São Miguel Island); Urban morphology of the Azores urban settlements (Horta in Faial Island).**

**Source: Google Earth.**

The territory's environmental, landscape and ecological qualities constitute an inheritance with potential significant future, especially to the more selective touristic market fringes, but that still do not have a significant impact over the territory's structure and dynamics, though the visible growing process. In other territories such dynamics were predators of the intrinsic environmental qualities, with long and medium term damages.

The deepened analysis and diagnosis relative to the Technical Basis Study "Urban Structure and Form" are based on the reading and assimilation of the existing Masterplan's urban land uses, related with the altimetry, the built area and the road structure.

With the analysis and diagnosis carried on, it was not detected any too much restrictive trend (according to which the demand for urban land is higher than the offer), unless those that, by graphic analysis, are punctually detected in some rural areas of S. Jorge island, namely high density areas that do not present compensatory expansion areas.

In other islands, one considers to exist an offer rate overlapped to the demand. When that offer is not clearly higher than the demand, it can even allow a relief in the housing market that will revert on the consumer's behalf. When that offer seems to exceed clearly the demand, the risk of urban expansion to become more appellative and accessible than the regeneration of the existing built area can be taken.

In what concerns to the housing park in the Azores territory, and as far as this paper is focused, there seems to be one major key-idea having as reference the Portuguese situation: a – apparent – minor dynamics on the housing park growth. One says apparent because although the housing park growth rate in Azores is clearly lower than the average one in the rest of the Portuguese territory (approximately half), the housing park of that Autonomous Region has been

growing, in its several compounds: there are more habitual residence dwellings, more free dwellings and more seasonal use dwellings or with absentee occupant (vacation or immigrants houses).

This analysis shows the existence of some structural characteristics of the Region's housing system, among which, in the context of the present paper, the existence of a *major trend to buildings typologies with one single dwelling and the promotion of individual dwellings*, stands out.

The strategic and prospective analysis that shaped the Azores Regional Plan aimed to identify the changing factors, that have its basis on possible transformations, at three levels: family transformations, in its dimensions and structure, in the organization of its resources; more direct transformations in housing and its markets; and, finally, and more important to the issue herewith discussed, territories' transformations, in its settlement patterns and in the distribution of opportunities to people and families.

### ***The Plan's contribute***

The Azores Regional Plan aims to contribute to the control of urban sprawled growth through the proposal of a balance between urban expansion and urban renewal.

According to the aforementioned about the PROT's, this is established through *General Norms*, related to the general character orientations, as well as technical criterions, administrative procedures and the necessary institutional mechanisms to the application and concretization of the Plan; *Specific Norms of Territorial Character*, that include the use and management orientations of the Azores territory, relative to each of the structuring systems of the territorial model and the specific orientations to apply in each territorial unit in which the Azores territory is divided; finally, through *Specific Norms of Sectorial Character*, that define the sectorial orientations with relevant consequences on the territory structuring.

The *General Norms* are those that have a more direct relation with the issue discussed in this paper, therefore, those that can better show how the Plan can contribute to the control of sprawled growth in Azores, namely by considering the following generic and transversal character norms to the territory's structuring, use, occupation and transformation:

- To privilege the urban settlements nucleation and its connections in overlapped nets of differentiated spatial extents, in an assumed polinucleation logic, promoting horizontal connections of functional complementarity, instead of hierarchized relations, potentially rigid and inhibiting of collaborations and partnerships.
- To promote the urban expansion areas contiguity and the effect of compaction, reinforcing the place cohesion and identity, and becoming more efficient and sustainable the endowment and the exploration of several infrastructure and equipments nets, as well as the complementarities and synergies that might be establish between them.
- To adopt a services decentralized land policy, in sintony with the reinforcement of the urban nucleations, enhancing the public transportation systems, inter and intra islands.
- To dose and to check the territorial contention and the respect policies of the several existent spatial systems, taking into account development scenarios that reclaim urban expansion, which ought to be, in one hand, sufficiently dimensioned in order not to induce to speculation actions over the property values and, on the other hand, too generous that might derivate involuntarily in urban sprawl or in the arising of considerable discontinuities between built spaces belonging to a same urban settlement.
- To value the existing and the emerging urbanity as well as the complementary rurality, considering that the distinction between urban and rural soil should not be merely the existence of permanent, seasonal or touristic edifications, but the ability to parcelate, as a differentiator and truly identifier factor of the urban spaces.



- To ensure the regional harmonization of the soil classification and qualification criteria, particularly its typification and correspondent urbanistic parameters.
- To define priority criteria to the territory's infrastructuring, according to the built-up areas density and the constraints of its surrounding area.
- To promote the central role of the ancient or historical urban spaces in the installment of goods and services as a way to the urban and paisagistic qualification.
- To promote the outdoors public spaces planning and management, integrating them actively in sustainable spatial structures as a privileged way of qualifying the urban settlements and especially of the urban expansion areas.
- To restructure the fragmented urban areas that present serious problems in terms of urbanistic structuring or infrastructuring, applying discerning measures of a positive discrimination in the municipal licences over those areas.
- To promote a phased-out and programmed urbanization consigned in execution units, in a formal (and functional) continuity principle with the built urban fabric, this is, establishing priorities in the future licences of new constructions and parcelling actions that could make possible, in a short term, to finish off the hiatuses between existent buildings or between emitted, but not materialized, licences in state of construction.
- To allow reconfigurations of the urban perimeters, in sintony with the applicable specific territorial norms and, when direct benefits to the regional ecological structure might be brought up from this relation, to stabilize fringes and to consolidate and value the perimeters.

With the definition of these norms, the Plan proposes to control urban sprawl in the Azores territory before, during and after the urbanization processes. By doing so, it will ensure that the local development finds a well balanced way to take place without compromising, on one hand, the urban settlements integrity, cohesion and, on the other hand, without compromising the preservation of the rural and natural spaces in the urban fringe that, in this territory, assume a considerable importance not only for the preservation of the local activities and identity, but also to the enhancement of touristic features.

Therefore, this Plan comprehends a sustainable urbanization process, in an environmental, economic and social perspective. This sustainability is achieved by guiding on how to control urban expansion over free areas (rural and/or natural), namely face to the central free spaces renewal, which will allow to preserve the ecological characteristics of the local ecosystem (by controlling the extent in which land-uses are changed, namely from green to built areas); to reduce the costs on the extension/creation of infrastructures, as well as on the CO2 emissions associated to traffic circulation (as it comprehends minor distances between and within urban settlements); and, finally, by ensuring urban cohesion, which is fundamental to the sense of community, through the materialization of social symbols in the public space, and, therefore, among with other requirements, to the public spaces' quality.

## **Conclusion**

The contribute that the new Azores Regional Plan gives to the control of the urban sprawled growth is to show how it can be achieved through the regulation of the urban expansion areas. Regarding the definition of efficient development principles capable to give flexibility to the urban development process, at a regional and local scale, this Plan conceives two main steps to the control of urban growth through urban planning: a complete diagnosis of the territory, identifying its characteristics, specificities, demands and dynamics; and a forecasting and evaluation of the urban development processes, through comparing the demand and the offer for urban growth.

In the end, this Plan is able to contribute, through its orientations aforementioned in this paper, to the control of urban sprawled growth by proposing a set of principles based on the balance between urban renewal and urban expansion. Regeneration, diversification and densification

come, thus, forward as principles that can be taken into action in urban planning, regarding a balance between urban renewal and urban expansion in the urban development processes.

Moreover, with this objectives, the new Azores Regional Plan, accomplishes one of the Portuguese's Regional Plans main proposes which is to *constitute an opportunity to create a forum of inter-sectorial and inter-institutional character capable to assume the concertation since the initial phases as a continuous process from which the co-integration of sectorial and territorial policies should result applied to the region* (Ministério do Ambiente 2005).

In other words, the Plan assumes a flexible position on the treatment of the urban sprawled growth issue, becoming planning closer from the real necessities of a city through promoting a relation on how much, where, when and how to grow, in the urban planning principles.

Assuming urban sprawl as a mainly negative phenomenon in contemporary cities, it is crucial for new urban planning to focus on this issue that might be considered (at least one of) the paradigm of contemporary urban development. However, it is not simple to say which would be the best tactic to face it mainly because of two reasons: first, although its many negative aspects, urban sprawl has also many positive aspects ascribed; second, face to the dynamic and heterogeneous contemporary societies, to establish rules in planning (which would be a secure way to control sprawl) is to create a rigid instrument of territorial management inadapted to the contemporary reality.

Considering this, urban planning in its legal instruments should be more focused on the proposition of orientations to control urban expansion through a balance between both compact and scattered patterns of growth. By doing so, urban planning will allow the city's growth to be adapted to the contemporary social dynamics, considering specially its demands.

Of course, if one establishes less rigid and more flexible parameters, therefore comprehending a bigger range of possible interpretations, a plan will have to be present before, during and after the urbanization processes, in order to ensure the urban settlements physical, social and cultural cohesion. On the other hand, it regards the preservation of the rural and natural spaces in the urban fringe, by guiding on how to control urban expansion over free areas, namely face to the central free spaces renewal. This means also, besides the direct control of urban sprawl, a more socially, economically and environmentally sustainable process of urbanization.

The innovation presented by this Regional Plan for the Azores Archipelago is that it emphasizes, in urban planning, the flexibility rather than the traditional regulation based on quantitative parameters and formulas that usually have been characterized the regional Portuguese plans' profile. This new quality given to PROTA – its peculiar flexibility – add to the plan the important chance to match better all the different realities of the insular territory (i.e. different processes and pressures, the variety of economic phenomena, etc.) without losing its efficacy.

Fernando Brandão Alves - Architect  
Paulo Conceição – Civil Engineer  
João Granadeiro Cortesão - Architect  
Paulo Pinho - Civil Engineer

Faculty of Engineering of Porto University  
Portugal

## References

- Alves, T. (2001). Multifuncionalidade e Desenvolvimento nas Áreas Rurais em Portugal. IV Colóquio Hispano-Português de Estudios Rurales: La Multifuncionalidad de los Espacios Rurales de la Península Ibérica. Santiago de Compostela.
- Amado, M. P. (2005). Planeamento Urbano Sustentável, Casal de Cambra: Caleidoscópio-Edição e Artes Gráficas, SA.
- Caetano, M., F. Monteiro, et al. (1999). Monitoring Urban Dynamics: Portugal no Contexto Europeu, Centro Nacional de Informação Geográfica.
- Carruthers, J. I. and G. F. Ulfarsson (2002). "Fragmentation and sprawl: Evidence from interregional analysis", *Growth and Change*, Vol.33, No.3.
- Domingues, Á. (1992). "Serviços à Produção e Centralidade Urbana - Da concentração metropolitana à desconcentração periférica", *Sociedade e Território*, Vol.17.
- Downs, A. (1999). "Some realities about sprawl and urban decline", *Housing Policy Debate*, Vol.10, No.4.
- Irwin, E. G. and N. E. Bockstael (2004). "Land use externalities, open space preservation, and urban sprawl", *Regional Science and urban Economics*, Vol.34, No.6.
- Llewelyn-Davies, Ed. (2000). Urban Design Compendium. London, English Partnerships.
- Lucy, W. H. and D. L. Phillips (1997). "The post-suburban era comes to Richmond: City decline, suburban transition, and exurban growth", *Landscape and Urban Planning*, Vol.36, No.4.
- Ministério do Ambiente, Ordenamento do território e do Desenvolvimento Regional (2005). PROT 2006 - Orientações Gerais para a Elaboração dos Planos Regionais de Ordenamento do Território, Gabinete do Secretario de Estado do Ordenamento do Território e das Cidades.
- Ministério do Ambiente, Ordenamento do território e do Desenvolvimento Regional (2007). Programa Nacional da Política de Ordenamento do Território - Programa de Acção.
- Mookherjee, D., E. Hoerauf, et al. (2006). "Urban Growth and Metropolitan Sprawl in a Small Metropolitan Area", *Focus on Geography*, Vol.49, No.3.
- Munoz, F. (2003). "Lock living: Urban sprawl in Mediterranean cities", *Cities*, Vol.20, No.6.
- Razin, E. (1998). "Policies to control urban sprawl: Planning regulations or changes in the 'rules of the game'?", *Urban Studies*, Vol.35, No.2.
- Stern, M. A. and W. M. Marsh (1997). "The decentred city: edge cities and the expanding metropolis", *Landscape and Urban Planning*, Vol.36, No.4.
- Sultana, S., J. Weber, et al. (2007). "Journey-to-Work Patterns in the Age of Sprawl: Evidence from Two Midsize Southern Metropolitan Areas", *Professional Geographer*, Vol.59, No.2.
- Távora, F. (2006). Da Organização do Espaço, Porto: Faculdade de Arquitectura da Universidade do Porto.

## Bibliography

- PROTA (2007). Plano Regional de Ordenamento do Território para a Região Autónoma dos Açores - Estudos de Fundamentação Técnica - Volume 8: Estrutura e Forma Urbana.
- PROTA (2007). Plano Regional de Ordenamento do Território para a Região Autónoma dos Açores - Estudos de Fundamentação Técnica - Volume 9: Habitação.
- PROTA (2007). Plano Regional de Ordenamento do Território para a Região Autónoma dos Açores - Fase V: Proposta Preliminar de modelo Territorial e de Normas Orientadoras - Volume 2: Modelo Territorial e Normas Orientadoras.