

Obsolescence of urban morphology in the historic center of Villena (Spain). Spatial analysis of the urban fabric in the ISUD/EDUSI candidature

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Abstract. *The Integrated Sustainable Urban Development strategy (ISUD in English and EDUSI in Spanish) is an urban planning tool that the Spanish municipalities with more than 20.000 inhabitants elaborate to opt to be funded by the European Regional Development Fund (ERDF) in the 2014-2020 period. The Villena municipality, located at southeast Spain, developed this tool in order to have a holistic and integrated vision of the situation of the city from the urban, social, economic and environmental points of view. As a part of the analysis performed to develop this strategy, a spatial analysis of the urban fabric of Villena was carried out. This study employed concepts from the typomorphological schools of Italy, England and France (Moudon, 1994) as well as from the research on relation between density and urban form (Churchman, 1999, Berghauser & Pont, 2009, Steadman, 2014). The data and cartography of the Spanish Cadaster, processed with SIG software, allowed the study. The spatial analysis included different variables of the built environment, including building height and age; plots size; open space ratios, not-built plots; type of built-plots according to height and built surface; and compactness of the fabrics. The results of this analysis showed a relationship between the morphological variables and the problems identified in the citizen participation meetings carried out for the elaboration of the ISUD. The identified aspects of urban morphology obsolescence allowed proposing strategies of action to update the built environment to current demands.*

Keywords: Integrated Sustainable Urban Development, agrocities.

Introduction

This paper presents the experience of the use of morphological studies in the elaboration of the Integrated Sustainable Urban Development Strategy (ISUD) of Villena, in Alicante (Spain). The proposed strategy was funded with

1,400,000 (of 2,800,000 total budget) in the first call of the competition organized by the Spanish Government to distribute the budget of the 12th Axis of Sustainable Development Operational Program, in 2016. In this first call only 82 of the 269 proposals were funded, while in the second call open in the end of 2016 only 41 proposals of 184 were selected.

The morphological analyses were a part of the diagnosis phase in the development of the strategy. Particularly they allowed deepening in the spatial causes of certain issues identified as weaknesses by the local administration and the activities of citizen participation carried out. In consequence, the morphological studies were focused on the analysis of the obsolescence of the urban fabric of the historical centre.

Villena in its context

Villena is located in the Penibetic valleys, protected by the sierras of Salinas, Peña Rubia or El Morrón, and with the sierra de la Villa as the base where the urban core sits. It communicates the Mediterranean coast with the north of Andalusia and the interior plateau. The river Vinalopó flows through the territory, as a vertebrate axis that forms the region of the “Alto Vinalopó” in which a brackish lagoon existed even until 1803.

With a municipality of 345 km² Villena is the second largest municipality of the province of Alicante. Its strategic location in what is known as the ‘Corridor of Vinalopó’ or ‘Corridor of Villena’ provides it a significant role in the connections between the interior and the coast. Moreover, the 11 municipalities bordering Villena belong to three autonomous communities and four provinces, making Villena not only an interior-coast crossing point but also a strategic territorial enclave. Another of the most valued resources in Villena is the fertile agricultural land in the southern part of the town, near the historic centre and with a strong cultural link with it.

The city is organized in neighbourhoods which have been part of the collective memory for a long time: San Francisco, Las Cruces, El Rabal, Las Virtudes, La Paz, La Encina, San Antón, El Grec, El Carril, El Mercado, Banda de Música and Paseo Chapí. Other areas are La Zafra and Sierra Salinas. La Morenica and Bulevar Maestro Carrascosa are two neighbourhoods located on the Villena axis, which have been growing due to the progressive increase in population. The delimitation of the historic center includes the entire neighbourhood of Rabal and a small

portion of the neighbourhood of San Anton. Urban morphology study as a tool in the ISUD Strategy of Villena (Alicante, Spain)

The European Commission launched in 2012 the Europe 2020 Strategy to establish a vision that encourages a Smart, sustainable and inclusive growth for the 2014-2020 multiannual financial framework. This framework distributes the European Structural and Investment Funds amongst the member states through an association agreement that distributes the funds through different regional and pluri-regional operational programs. The Spanish Government established at the European Regional Development Funds the Intelligent Development Operational Program (POCINT in Spanish) and the Sustainable Development Operational Program (POCS).

The Integrated Sustainable Urban Development Strategy (ISUD) is a new tool developed by the Ministry of Finance and Public Administration of Spain to distribute the budget of the 12th Axis (urban axis) of POCS. The Ministry launched a grant call through a competition to ensure that all the Spanish municipalities bigger than 20.000 inhabitants which aimed for the European ERDF funds meet all the objectives established by the European Commission. The first call was launched through the order HAP/2427/2015, on November 13th 2015, and the second call was launched through the order HAP/1610/2016, on October 6th 2016.

Through the competition and the elaboration of this strategy, the European Commission ensured that all the town councils were working from a strategic approach (long term), analysing and evaluating continuously objective indicators. In this way, the results of the investment funds could be measured and checked, and the perception and interest of the inhabitants could be taken into consideration to define the strategies’ goals.

The citizen participation process of the ISUD strategy was ruled in the Ministry call. The first step of this process was to create a website and social media to spread the ideas and make an open survey. On the other hand, an urban diagnostic event was organized, using the SWOT methodology (Strengths, Weakness,

Opportunities, Threats). Then, a second participation event was celebrated, where all the proposals were revised and the most urgent among them prioritized to improve the situation of the city of Villena. This participation should be transversal (open to all the inhabitants), but it was also intended to be sectoral through all the relevant socio-economic groups (tourism, agriculture, youth, business...).

One of the conclusions identified in this participation process was the need to concentrate the actions in the most deprived areas: the historical city centre and San Francisco neighbourhood. Both areas had a damaged urban, economic and social fabric, reason why many of the proposals were oriented to the recovery of these historical urban plots to make them meet the needs of today's city lifestyle.

For a better understanding of these areas, it was decided to analyse all the specific morphological features to get some indicators that could show and explain their obsolescence. The change in the forms used during the 20th century in the peripheries of European cities led to an increase in studies of urban morphology in its last decades. Within these studies, schools of typomorphology created a very useful body of concepts and definitions to describe the form of the city. Moudon (1994) distinguished three distinct schools, located in Italy (around the works of architects Muratori and Caniggia, among others), England (around the Urban Morphology Research Group of the University of Birmingham, led by geographer Conzen) and France (in The School of Versailles around the architects, Jean Castex, Philippe Panerai and Charles Depaule). His readings of the shape of the city come from three basic principles:

The interpretation of the city as an organism formed by interrelated elements that create components of larger scale.

The consideration of the historicity of the city, an organism built over time under different needs and situations.

The consideration of the urban space as the result of a social construction whose purpose is to satisfy the spatial needs for social practice (Lefebvre, 1968).

In an urban organism structured in a

graduated and progressive way over time, the definition of the elements that compose the fabric at each of its levels is the essential aspect when confronting its analysis. Different authors of the schools of urban typomorphology have agreed to identify the built plot as a determinant element of the urban fabric form, as it happens in the works of Conzen (1960), Muratori (1960), Caniggia (1979) or Panerai (1980).

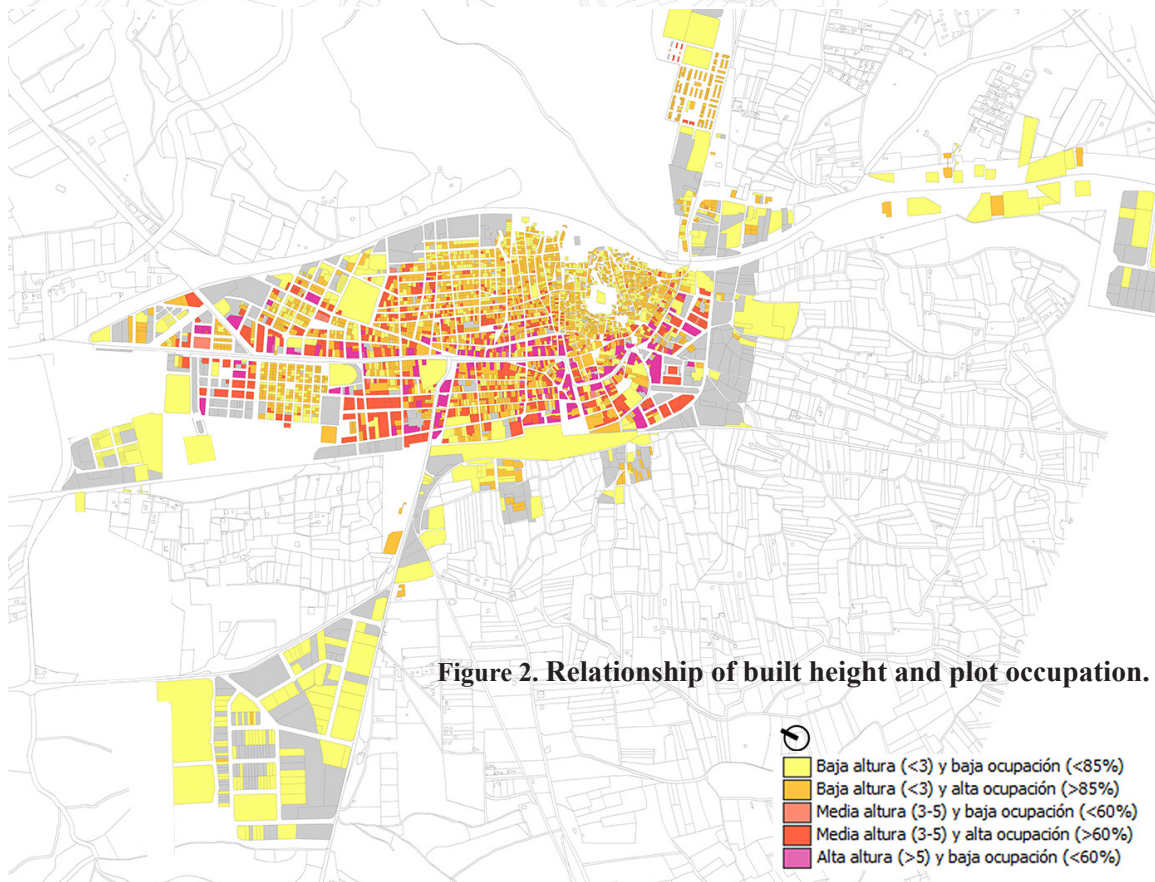
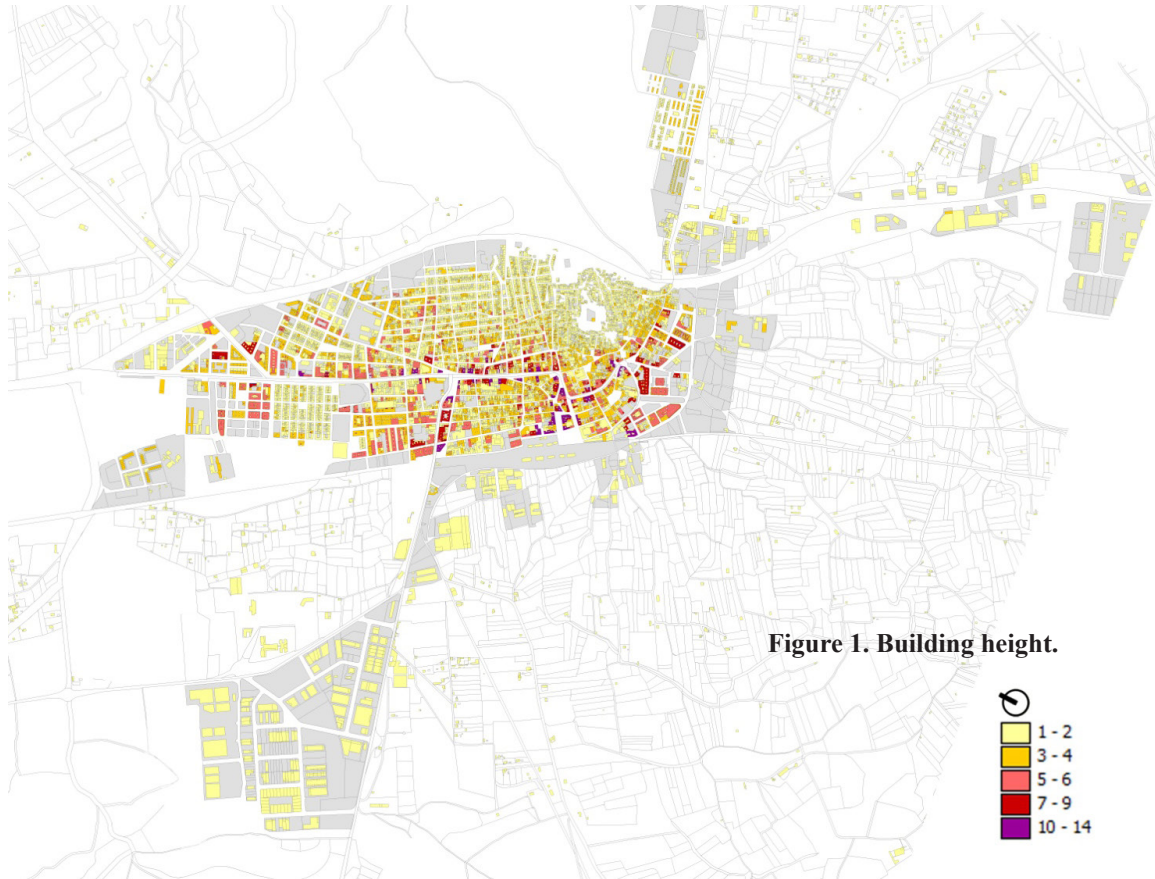
The use of the built plot as a starting point allows interpreting, with a certain economy of resources, the relations between the built space and the open space in different scales. Taking as an example the analysis of the Gothic fabric of San Canciano by Muratori, he points out how the dense and varied plots, the individual demands and the layout of the canals lead to "a rich interconnected and interdependence Gothic urban structure" (Muratori, 1960).

Shortly after these first schools of typomorphology began the investigation of the qualities of urban form from spatial analysis. In this research line, density quickly acquired a central role to study the way in which the form is perceived (Alexander, Reed and Murphy, 1988, Churchman 1999, Uytengaak 2008, Berghauser and Pont 2009; Boyko and Cooper, 2011). Their attention has focused on the analysis of how the way in which buildings are organized alters the different meanings of density: perceived, physical and measurable. They were, therefore, working in the same line as the schools of typomorphology.

Using these principles of the schools of typomorphology, an analysis of Villena's urban environment was made, focused on:

The characteristics of the built plots.

The proportion between built and open spaces, with an approach on the aspects that could indicate the obsolescence of the historic centre area.



Obsolescence of urban morphology in the historic center of Villena

In the last decades Villena's urban development was encouraged by the costs in the new peripheral land for growth, lower than in the urban core, where the profitability of private investment was smaller. On this situation, Villena has grown to the north and south, while infrastructures (the highway A-31 and the railway line) have acted as barriers for the east and west expansion.

The expansion in this north-south direction was larger towards the north, as the agricultural lands in the south (that are also flooding areas) prevented the growth. The urban area has practically doubled since the mid-twentieth century, this growth coinciding with a period of economic development.

Derived from this urban development, the city has at the axis that links its north and south limits the buildings which are in a best condition. When moving away from this main axis the building deterioration grows up, and it is particularly concentrated in the historic centre.

The historic centre sits on a hill crowned by the Atalaya castle, which is protected by its cultural interest. Nevertheless the orographic and historical facts created a complex urban fabric that added to the building typology implies high costs in the rehabilitation/consolidation process. Besides, the displacement of the population to new housing areas outside this old core caused the abandonment of a significant amount of buildings. Currently, the historic centre could be divided into two areas, top and bottom of the hill.

The bottom part has higher occupancy and better conservation status, although its construction technology lacks of the current standards. The situation of this part is stimulated by the proximity and connection with the rest of the city and services, since the historical centre has been losing its commercial activity at the same time that its population.

Meanwhile, the top part has serious problems of accessibility due to its street structure adapted to the terrain. This handicap, together with the ones described below, reduces the private investment in the area and makes its recovery more expensive.

Another notable weakness of the historic centre is the obsolescence of the basic urban facilities, which are outdated or even inexistent in many areas.

Characteristics of the built plots

The analyses of the characteristics of the built plots were centred on their age, their size and their relation between built heights and occupation. The first two items revealed situations that compromise the urban environmental quality of the historic centre.

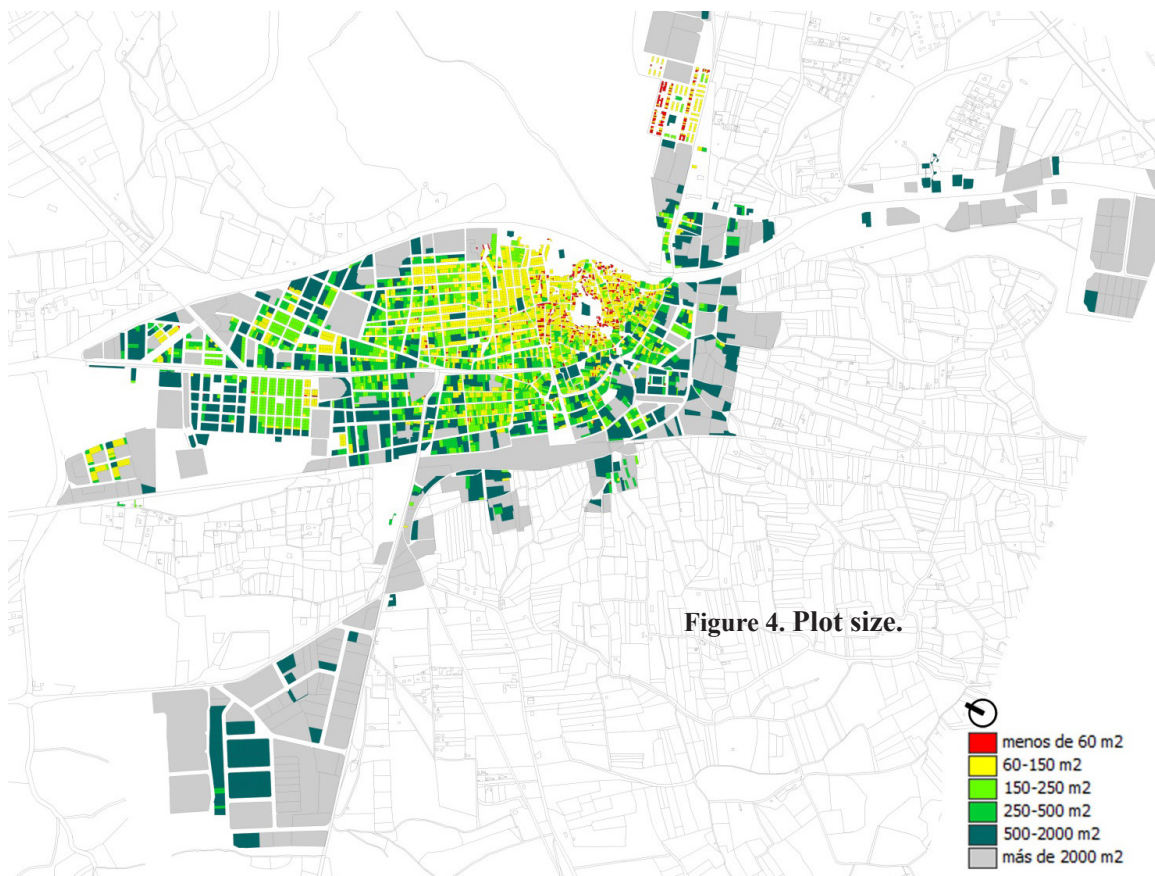
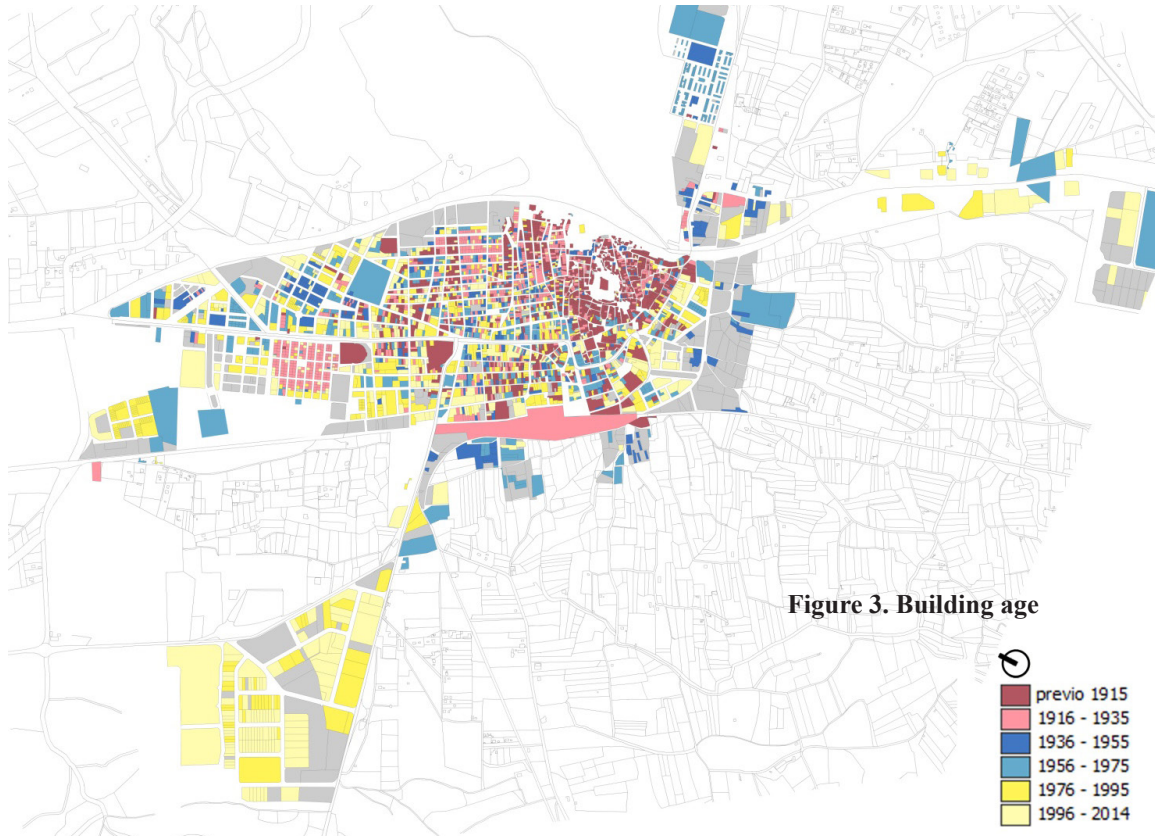
The analysis of the height of the buildings clearly shows the great road axis N-S (Constitution Avenue) and also the transversal axes that part from the main axis towards the West, which are the exits of the city to the agricultural lands.

The historical centre forces the turn of this main axis to the west. This turning point is key to the development of accessibility strategies that helps the integration of the historical centre into the main functional area of Villena. However, the west and south limits of the historic centre are composed of higher buildings that difficult the access. It can also be observed that these areas (Corredera and Nueva streets) are disassociated with the fabric of the historical centre.

It is also clearly identified the isolated situation of the San Francisco neighbourhood, its disconnection and its physical discontinuity with respect to the compact urban fabric of the city centre.

The analysis of the relation height-occupation at the built plot level showed a diversity of types, from which some characteristics related with the habitability of the dwellings were extracted. In the historical centre and in the San Francisco neighbourhood the dominant types are buildings of less than 3 heights occupying practically the whole of the plot, which implies, in most cases:

The coincidence of the facade of the building with the plot boundary and, in consequence, the existence of rooms in the ground floor that open directly to the street, affecting their privacy.



The very reduced dimensions of existing backyards, which makes difficult the lighting and ventilation of the interior spaces.

In buildings of more than three heights, dominant in the rest of the urban area, the plot is also almost completely occupied. Considering how the built plots are added to each other and the lack of open space in these environments, the ventilation and sun exposure of many rooms is not updated to current standards. This makes more necessary the generation of a public space of quality that compensates the deficiencies and avoids the abandonment of the central area.

The analysis of the building age showed a marked lack of renovation in the historic centre. This characteristic was found in the citizen participation sessions as one of the features that caused the decrease of the quality of the urban environment. The morphological analysis allowed the delimitation of the area affected by this problem.

Finally, the analysis of the plot size revealed a very dangerous concentration of plots smaller than 60m² in the historic centre. This weakness was also highlighted by the agents involved in the elaboration of the ISUD strategy. It causes a lower quality of the dwelling and it is a hard condition in the rehabilitation of the area.

The north part of the historic centre is composed by plots from 50 to 150m², which also decrease its appeal to the necessary renovation and prevent the incorporation of non-residential uses. The absence of facilities and shops in this fabric was revealed as a factor that contributes to the displacement of all Villena's activity to the Constitución Avenue, accentuating the disconnection of the historic centre.

Relationship of built and non-built areas

The analysis of the proportion between built and un-built spaces yielded information more difficult to perceive. Especially significant were those on the ratio of free space per built area, which were related to the weaknesses of some areas whose buildings were under moderately satisfactory conditions. In addition, it was revealed the potential of the historic

centre as an area provided with open spaces, located around the castle. This exceptionality, with respect to the rest of the urban centre, determine the incorporation of this space as a key piece in the ISUD strategy.

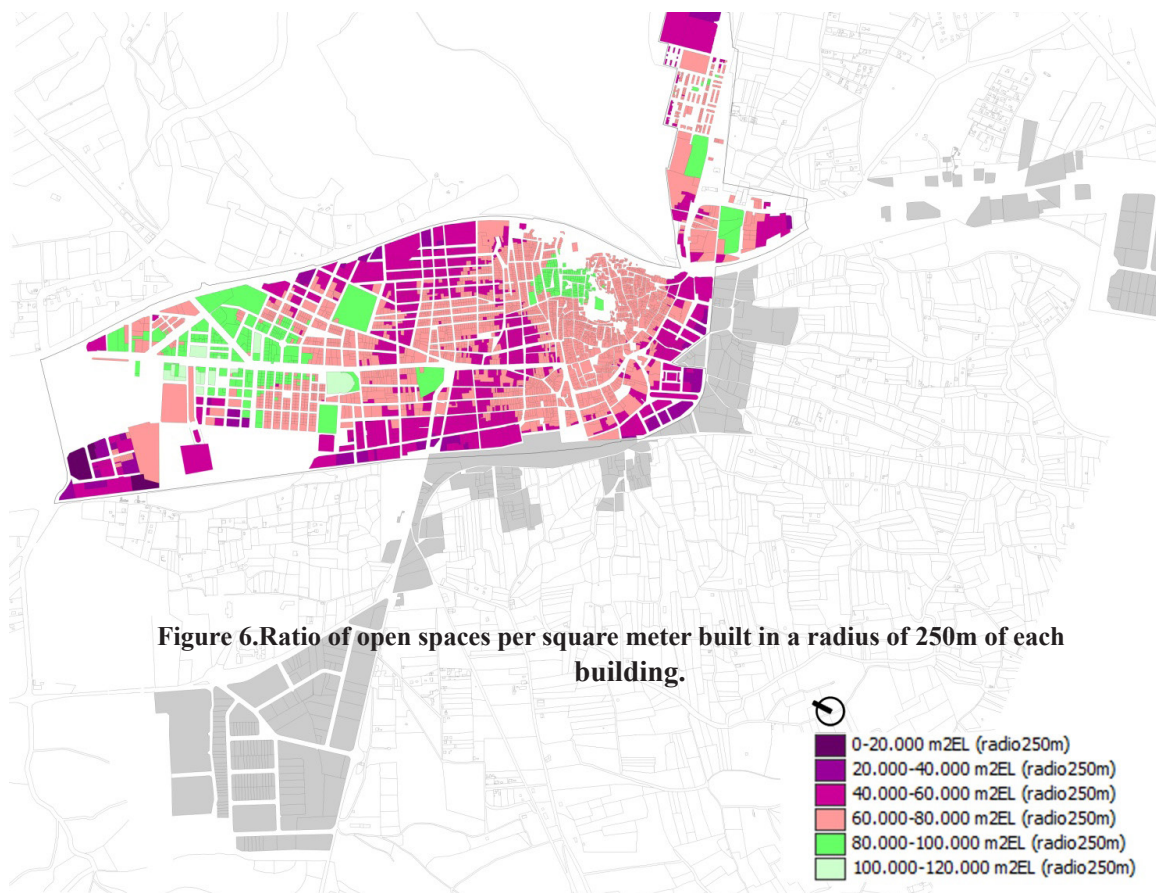
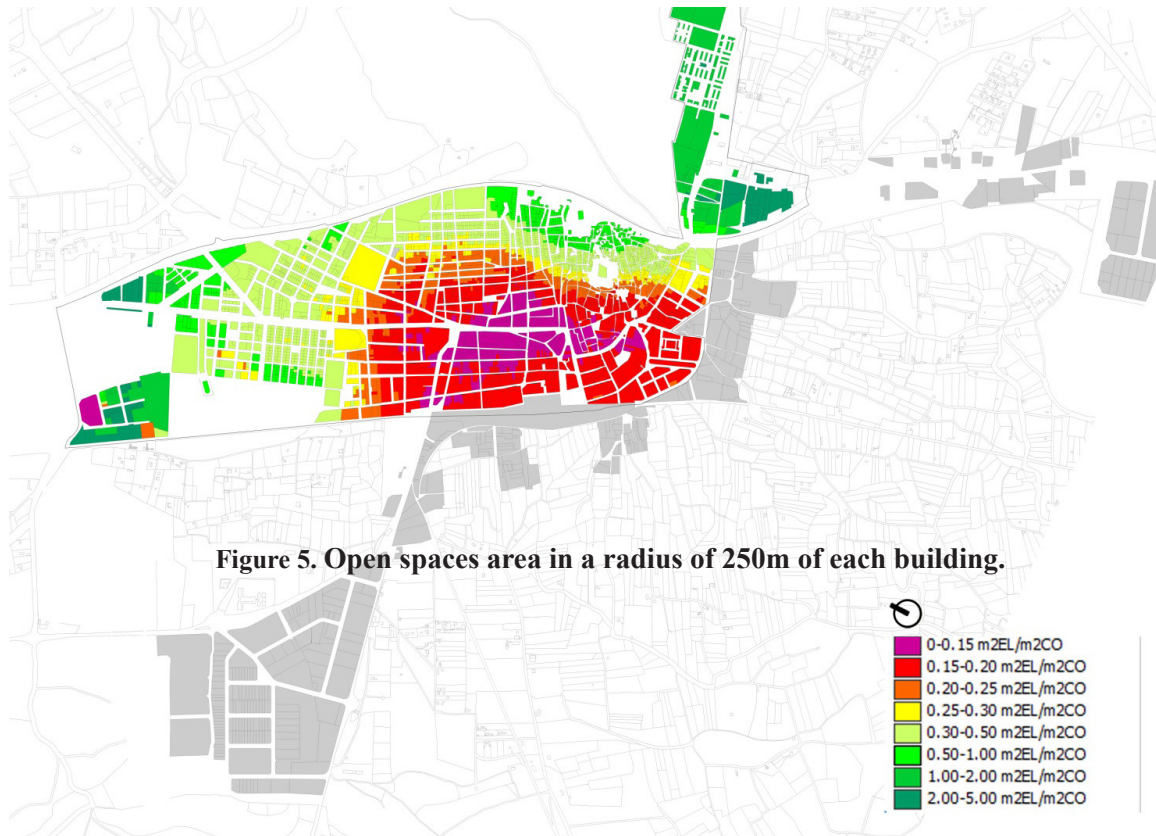
The analysis of open public space available in a 250m radius area around each building also clarified the causes of some weaknesses identified in the citizen participation sessions. Due to the railway and highway at East and West of the city, the areas in contact with these infrastructures become "corners" or "cul-de-sac". These areas are represented in purple in the figure, with a very low amount of open space in their immediate environment. In the ISUD strategy it was considered that providing these areas with a greater amount of open space would help to alleviate the negative effects of the infrastructures that constrain the urban area.

On the contrary, the historic centre was perceived as an opportunity space, due to a greater availability of open space.

The analysis of the public space in a radius of 250m per square meter built was made to weight the data of the previous analysis according to the density of the fabric. The scarcity of open public spaces per dwelling (less than 15m²/dw) in the Constitución Avenue, especially at the southern corner of the Plaza de María Auxiliadora stands out in this analysis. The open space around the Castle is the closest to all the highly saturated urban centrality.

In contrast, in the San Francisco neighbourhood the ratio of open space per dwelling is higher than in the rest of the urban area. The use of open blocks in the mid-twentieth century urban complexes was accompanied by large amounts of public spaces. However, many of them were never developed because of the insufficient resources to face its construction and maintenance. To deal with this problem, a privatization of these open spaces has been proposed in other cities as a strategy to improve their quality and their utilization.

With the analysis of the compactness and density a vision of the characteristics of the urban fabric was obtained. The figure shows in purple the very compact tissues (between 50 and 70% of the floor occupied), in red the



compact ones (between 35 and 50%), in green the little compact ones (between 20 and 35 %) and in yellow the less compact (less than 20%). Most of the urban area is very compact, which makes the quality of the available public space essential.

According to this analysis it was considered interesting to locate new open spaces in the central area, given the shortage of these in it. In the historical centre the improvement of the open space around the Castle was considered, becoming this space in a expansion area of the compact fabrics. In the same way, the irrigated agricultural spaces, by its proximity, could act as leisure and expansion areas that compensate the compact urban areas.

Finally, an analysis of the non-built plots was carried out, being considered spaces of opportunity for the actions defined in the ISUD strategy. Most of the empty plots are in those areas close to the infrastructures where there is a shortage of open space. The possible construction of these plots would make the open space available even smaller.

The non-built plots existing in the historic centre are an opportunity for the incorporation of new uses and users to the area. In addition, as a result of municipality policies to promote the revitalization and reactivation of the area, there are several plots and empty buildings of municipal ownership.

Integration of urban morphology analyses in the ISUD strategy of Villena

The information obtained in the morphological analysis was employed in the definition of the specific actions of the ISUD strategy, which were presented for funding. Some of the most notable relations between analysis and actions are:

The non-built plots analysis allowed to identify that its distribution matched the perimeter of the city and crossed throughout the historical centre. Thanks to this comprehension, many projects came out to help to reduce the impact of the contact between the urban fabric and the infrastructures of the highway and the railway. Also, it was proposed a green space network crossing the historic centre, connecting

the main natural and tourism resources of the city.

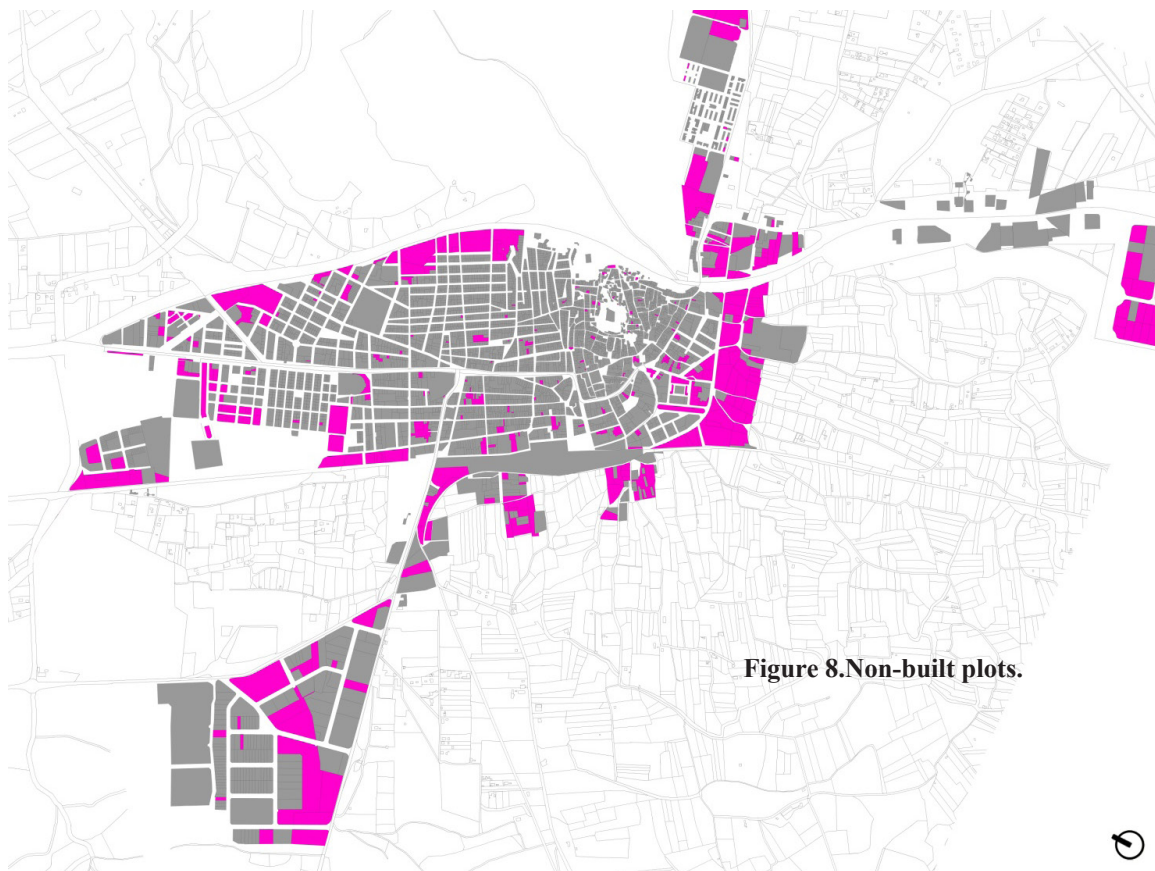
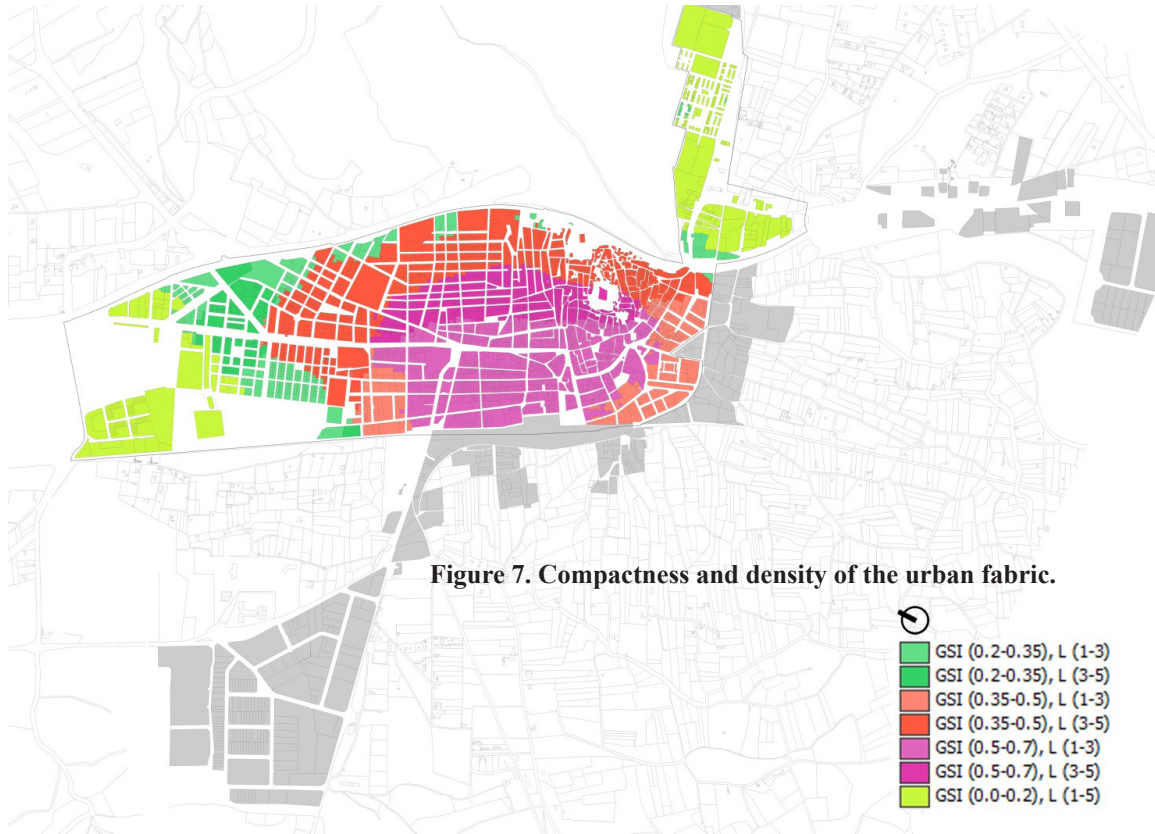
The analysis of the built plots served to identify habitability problems of the dwellings both in the historic centre and in the San Francisco neighbourhood. A high concentration of houses smaller than 60 m² and of old buildings (from twentieth century beginning) at the city centre showed the need to renovation of the building in the area. Several action lines were proposed to help and encourage the physical renewal of the urban fabric.

The analyses of the accessibility to open spaces showed some advantages of the historic fabric that commonly were considered with the worst urban condition. It generates a series of actions focused on improving the importance of this fabric in the open spaces network

Conclusions

The use of morphological analysis in the development of the ISUD strategy of Villena was considered as a tool to contrast the results of the SWOT analysis realized with local authorities and in the citizen participation first phase. The morphological approach allowed to deep in the reasons of the weaknesses detected, understanding the influence of spatial configuration of the urban fabrics. The results obtained from this urban form study helped to develop the actions included in the ISUD strategy, which were validated again in a second phase of discussion and citizen participation.

The characteristics of the built-plot, the way that they are grouped and the relationship between the interior and the open spaces centred the analysis, coinciding with the founding typomorphological schools. However, in this case the study was based on quantitative variables (calculated thanks to Geographic Information Systems) that measure different proportions of built and un-built space, which link the method with the studies of urban configuration through density.



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