

## DETECTING OPPORTUNITIES: NEIGHBOURHOOD DATA DYNAMICS FOR URBAN REGENERATION IN VALLADOLID (SPAIN)

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### Abstract

Urban regeneration has become a priority for urban planning in Spain, because it is one of the best ways to foster a more sustainable, compact and mixed-use urban model, founded in the improvement of existing city. The Master Plan of Valladolid (Spain) has been an opportunity to tackle this objective by a thorough study of existing urban fabrics, in order to program future actions and projects.

The built city was divided into units, and each of them was carefully analysed in order to identify opportunities for improvement, such as vacant spaces or deprived areas. Every regeneration action was then designed to also generate a positive impact on its surroundings, which requires knowing the needs and structural deficits of each neighbourhood. That's why a homogeneous "neighbourhood data system" was created, in order to propose the most appropriate action for each case.

However, "measuring" the city is a difficult task. There are different official sources of urban data, but they are not oriented to this kind of evaluation. For instance, census data have lost accuracy due to its new methodology (2011), and their level of disaggregation is often inadequate. Other sources such as Cadastre are aimed at tax purposes and they must therefore be reinterpreted.

Through the case of Valladolid we can show a method based on both identifying opportunities for improvement and analysing available urban data. Avoiding the loss of a global overview of the whole city, it builds a working knowledge that allows programming more efficient urban regeneration actions.

### Urban regeneration context

In recent years, sustainability, energy efficiency, social equity or building rehabilitation become dominant axes in the European urbanism. Especially in the Spanish case, one might consider whether this is a firm commitment or whether it is a temporary situation, due to the economic crisis and the slowdown in urban growth. Anyway, it is demonstrated the increase of social inequalities and the problem concerning sources of energy and global warming. Although the first one is a hypothesis that only time will answer, the fact is that discipline and regulatory framework are strongly oriented to this extent.

After assuming the principle of sustainable development, European regulations have tried to be more specific in this way. The Leipzig Charter on Sustainable European Cities (2007), the Toledo Declaration on Integrated Urban Regeneration<sup>1</sup> (2010) or the Territorial Agenda 2020: towards an inclusive, smart, and sustainable Europe of diverse regions (2011) could be mentioned.

### *Urban regeneration as a priority to Spanish urban planning*

In Spain, urban regeneration and building rehabilitation intend to be priority goals. After 30 years of experiences on Comprehensive Rehabilitation Areas and Urban Plans, regulations have been recently renovated. The 8/2013 Act, of 26 June, about rehabilitation, regeneration and urban renewal, has helped to this trend. Having national range, it is oriented to facilitate interventions concerning to property regulations, intervention initiatives or neighbourhood communities.

At our regional level, where legislative urban competency resides, it is also evident the commitment to urban regeneration in order to improve existing cities. In the Autonomous Region of Castilla y León —the largest Spanish region—, we find the 7/2014 Act, of 12 September, about measures on rehabilitation, regeneration, urban renewal and sustainability, and also about coordination and simplification in urban planning. It is a reform of the previous urbanism act, and it makes an approach that "goes beyond the strictly physical aspects". This law recognise the importance played by the so-called "vulnerable urban spaces", promoting urban regeneration actions on those spaces where physical degradation comes together with other factors of social vulnerability. To sum up, 7/2014 Act orients urban development towards regeneration of unconsolidated spaces with the purpose of improving existing cities instead of expansive growth. In addition, Castilla y León has recently drawn up separate rehabilitation

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<sup>1</sup> The *Instituto Universitario de Urbanística* worked for the previous studies which ended on this Declaration: **Álvarez Mora**, Alfonso; and **Roch Peña**, Fernando [dir.]. *Integrated Urban Regeneration in the European Union: Toledo Informal Ministerial Meeting on Urban Development*. Toledo: Ministerio de Vivienda, 2010.

plans and regeneration strategies as complementary programs of intervention, which are related to housing plans<sup>2</sup>.

Within this new context, urban planning is called to play a decisive role, guiding urban regeneration actions. In this sense, the figure of the "urban units" emerges as a great opportunity.

*Urban units: an instrument for the analysis of existing urban fabric as a prior action for the regeneration program*

The concept of "urban unit" is contained in the Urban Planning Regulation of Castilla y León — RUCyL, approved by the 22/2004 Decree of 29 January—. Thus, municipalities from 20,000 inhabitants have to divide the consolidated urban space in areas called "urban units" in their General Urban Development or Master Plans —PGOU—. Units refer to traditional neighbourhoods, homogeneous areas or spheres of influence of their facilities.

The interest of these units lies on going beyond simple zoning ordinances, affecting socioeconomic characteristics and not just morphological. They aim to control the built density and they assess the functional adequacy of existing or future facilities in relation to their needs. Thus, imbalances of global urban structure can be detected and built and population density can be controlled, limiting its increase where they are already high.

From this point of view, urban units becomes a mechanism oriented to the assessment of existing tissues, but legislation is open enough to leave to the planner the possibility of extending the functions of this figure. This operative function is what we find as a new possibility in the urban practice in Castile and León. Thus, it is possible to use urban units not only as an analytical tool, but also management, connecting to an urban tradition with a clear proactive vocation. The use of the neighbourhood as a planning figure has a wide number of precedents, being linked to urban growth and decentralization proposals but also to ensure an adequate distribution of facilities and services. Throughout the twentieth century this idea could be explored through diverse concepts, like the neighbourhood units, the *grilles d'équipement* for the French *grands ensembles*, the satellite towns, planned communities, etc. Anyway, the basic concept of these views revolves around their inhabitants and the amount of services and facilities required in order obtaining certain self-sufficiency.

After all this baggage, and being into the urban and socio-economic context set out above, the Revision of the PGOU of Valladolid has outlined the use of this tool from a regeneration perspective. The Revision tries to extract its full potential as a diagnostic tool and simultaneously oriented to the management of existing urban fabric. The analysis of each unit and comparative study allows a better understanding of the urban structure of the city, which is especially necessary for a regeneration strategy.

The aforementioned 7/2014 Act has introduced flexibility criteria, defining new instruments to undertake rehabilitation, regeneration and urban renewal, so that urban units can serve as the strategic framework to guide and to help to develop future interventions. So, they would operate

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<sup>2</sup> The *Instituto Universitario de Urbanística* has developed the Strategy for Urban Regeneration in Castilla y León, to be adopted during 2016.

as an instrument of control of density and functionality, ensuring that the specific actions have a positive effect not only in its own unit, but also in the environment of which they are part.

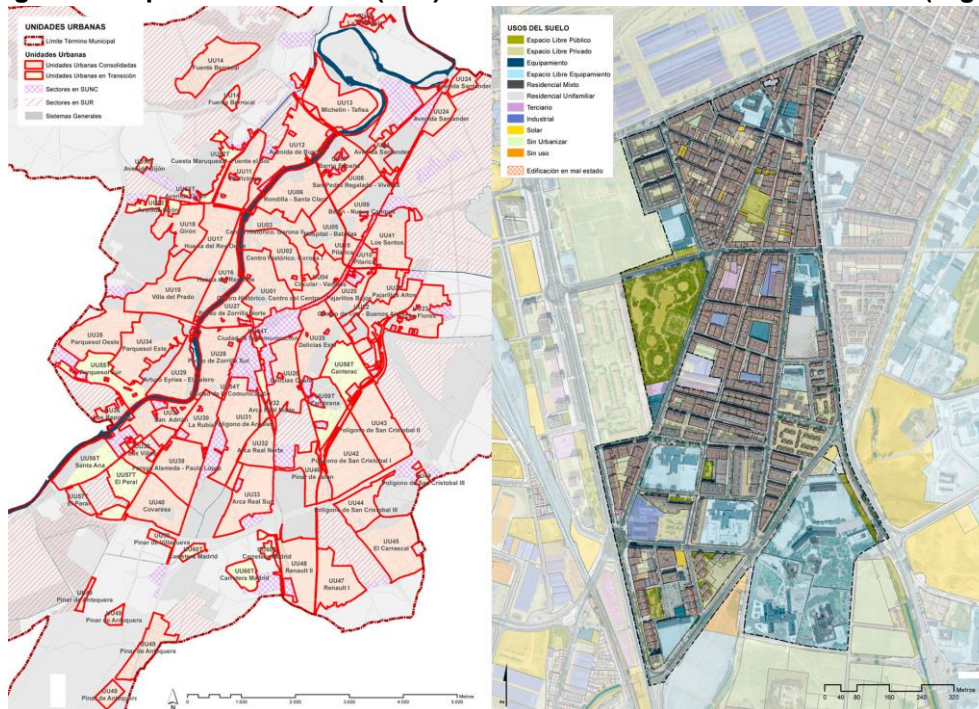
### Difficulties for "measuring" the city

The practical application of the figure of the urban units within the framework of the Revision of the PGOU of Valladolid has consisted of two basic processes: (i) spatial and functional delimitation of urban units and (ii) obtaining a set of indicators to show their needs and being useful to apply management criteria.

Thus, the study of Valladolid for subsequent planning began with the division of the city in 60 urban units. This fact arises from the 28 neighbourhoods that had already been detected in the phase of planning information and advancement. After this, we ought to adapt them to the limit of 100 hectares per unit which establishes the RUCYL trying to distribute equitably the existing amenities —services and open spaces— when a neighbourhood had to be divided.

Then, the RUCyL sets out the obligation of knowing the resident population, the number of homes and properties with other uses, the built surface for each use and their percentages —in order to know the predominant use in each one of them— and areas of public facilities and open spaces, with the intention of having a detailed knowledge of each unit and its position compared with others (figure 1).

**Figure 1. Maps of Urban Units (Left) and Urban Unit 26 – “Delicias Oeste” (Right)**



Source: Authors

Delimitation of urban units according to our established regulations and urban criteria meant the necessity of manage data per block, to be accurate with the limits. That is why we could not use pre-set statistical areas like census one, which had been valid for a first approach at the

neighbourhood level. Fieldwork and several data sources ought to be used, like the Population and Housing National Census, the National Statistics Institute —INE—, the Municipal Population Census and the information provided by the Cadastral General Directorate, so as to face difficulties arising from the level of disaggregation of the required data.<sup>3</sup>

### *Population and Housing in National and Municipal Census*

The Population and Housing National Census is conducted every 10 years by the INE, being the last one from the 1st November 2011. At the moment of working for the analysis of urban units in 2013, it was already available the exploitation of population data, while housing data were only available to general levels, remaining insufficient for this work.

Demographic analysis consisted on direct exploitation of the Municipal Population Census, with data from 2012. Employees from the City Council proceeded to disaggregate data at the level of city blocks in order to achieve the desired accuracy level, since official data of the INE can only be studied at bigger levels. Going further than the usual data offered by the INE, information about family structures and homes was also obtained. This disaggregation required manual check in some cases, assigning to the correct block data that otherwise would remain untraced in the plane.

For housing analysis, to achieve a similar level of detail like demographic, data from the 2001 Census would have been demanded —data from the last Census, 2011 were not available yet—. Even now, with the new data already available, another factor needs to be considered: the change in the census methodology compared to the previous census in 2001. In 2011, the collection of information was performed using statistical and administrative sources, generating an initial territorial directory with data related to Cadastre, Tax Office, etc. The rest of the information was obtained from a survey of approximately 12.3% of the population, filled in by Internet, mail or through fieldwork visits made by census agents. Therefore, it is preferred to use the information provided by the Cadastral General Directorate.

### *Cadastral Data*

The Cadastral General Directorate was created as an administrative register where real estate properties —for urban, rustic and special real state ownerships— are described in a tax purpose. It provides periodically updated data of real estate, both rustic and urban, in each municipality.

Although its purpose is not the urban knowledge of the city, the evolution of the cadastral service and the evolution of technologies that support it make it a territorial database of great interest to the approach to built spaces of the city. After collaboration agreements for cadastral updates between the State and other administrations, their use has been expanded for other purposes, like mapping, data provided and information associated with it.

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<sup>3</sup> In this regard, see: **Ariza López**, Francisco Javier. *Fundamentos de Evaluación de la Calidad de la Información Geográfica*. Jaén (Spain) : Universidad de Jaén. Servicio de publicaciones e intercambio, 2013.

Technical and legislative developments —like European Directive INSPIRE<sup>4</sup>, related to the reuse of public sector information, etc.— provide access to unprotected alphanumeric data and mapping in vector format. These data are regularly updated by The Cadastral General Directorate and they are available for download over the Internet. In the case of Valladolid, for measuring data of the urban units, information from 20th September 2012 was used.

Alphanumeric information, available through the Cadastral Virtual Office, is structured in five tables depending on the type and the information in each record. This way, records with information by plot, construction unit, building, property unit and other records as sharing common elements can be found. Therefore, it is observed that the unit on which the cadastral information is available depends on the content, so the unit may be even smaller than plot level —until the unit of individual property—.

Available data, depending on the type of record, are very diverse. For every plot, location and positioning, land surface, built surfaces above ground and below ground and covered surface are provided. The construction unit provides data about the year of construction, year and types of reform, total cadastral area and built typologies. The Cadastral Technical Assessment Standards ranks 10 construction types at its first level of classification: 1. residential, 2. industrial, 3. offices, 4. commercial, 5. sports, 6. shows, 7. leisure and hostelry, 8. health and charity, 9. cultural and religious and 10. singular buildings<sup>5</sup>. For a correct assessment in the calculation of the surfaces it was useful to differentiate the second and third level of classification for some types: garages, storage rooms, empty rooms, porches and annexes -in residential typologies- and surfaces of garages and parking -in industrial typologies-. Finally, at the level of individual property records, data uses, codified in 16 different uses, are offered. After all, a very detailed breakdown of typological structure, uses and urban morphology can be achieved.

The different purpose of the data, from fiscal to urban planning ones, required a reinterpretation to fit the established criteria for urban units' measurement. Thus, the exploitation of cadastral data has been done by adding them to plot and block levels, from each element of the different tables. The block level corresponds to the same detail achieved using the Municipal Population Census. Combining tables, built surfaces, uses and typologies are reached.

### *Fieldwork*

Facilities and public open spaces adequacy level required measuring them in each urban unit. To do this, it was necessary to compare the data provided by Cadastre on built facilities surfaces, according to the typological classification, as mentioned above. As the purpose of this

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<sup>4</sup> Directive 2007/2/EC of the European Parliament and of the Council, of 14 March 2007, establishing an Infrastructure for Spatial Information in the European Community (INSPIRE). It is also related to Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, and to Spanish legislation: 14/2010 Act, of 5 July on infrastructure and geographic information services in Spain (LISIGE). See also: **Tóth**, Katalin; **Tomas**, Robert; **Nunes de Lima**, Vanda; and **Cetl**, Vlado. *Data Quality in INSPIRE: Balancing Legal Obligations with Technical Aspects*. Luxembourg : Publications Office of the European Union, 2013; and **Kerski**, Joseph J.; and **Clark**, Jill. *The GIS Guide to Public Domain Data*. Redlands (California, USA) : ESRI Press, 2012.

<sup>5</sup> Royal Decree 1020/1993, of 25 June, on Technical Assessment Standards and Framework Table of Land and Buildings Values land and buildings to determine the cadastral value of real estates of urban nature (NTV).

classification is the establishment of cadastral valuations, it does not always match what urban planning criteria could consider as facilities, especially in some types and buildings. For example, “Singular buildings” comprise both administrative buildings and representative ones, while under “health and charity” types are included not only large hospitals, but also smaller clinics, both public and private.

Fieldwork consisted therefore in identifying facilities and open public spaces plots, through both current urban planning or inventories of public goods and the “in site” identification, which in the advance phase of the review of the PGOU resulted in the Inventory of Facilities in the municipality of Valladolid. Once these plots were identified, their surfaces were measured so as to get the final count for each urban unit.

### *Homogeneous system of neighbourhood data*

After obtaining all the necessary information and adapting it to this particular project, a homogeneous information system was obtained. The information collected at block level was reassigned to the corresponding urban unit, in order to obtain their basic data and to calculate some indicators to characterize their profile. It was possible then a diagnosis by comparison that would serve to design further actions of the PGOU.

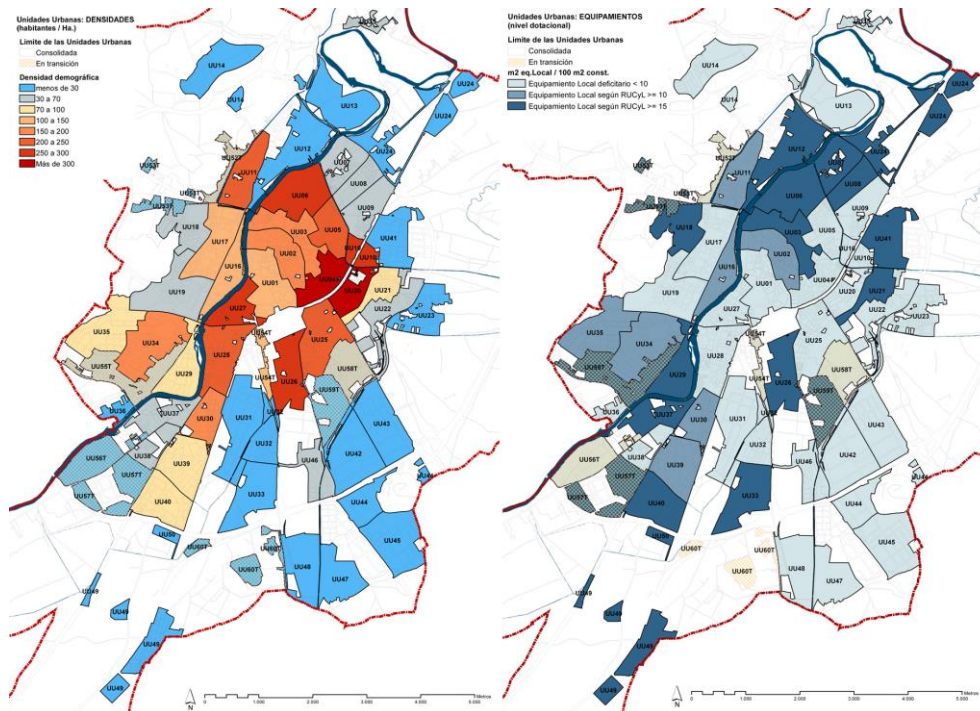
Specifically, the data collected for each urban unit from the data sources described above were its surface, the population in 2012, the number of households and the total number of cadastral properties and their built-up area. It has also been necessary for PGOU urban purposes to calculate both the number of properties for each of the 16 uses established by Cadastre and the built-up area for each of the 10 main types of the Cadastral Technical Assessment Standards. In this case, areas corresponding to garages, storage rooms, porches and annexes—in residential use—and areas corresponding to garages and parking lots—in industrial use—were considered apart.

The basic data of each unit were needed to calculate some density levels and compare them with the density levels established in the planning legislation, in order to control future increases or variations thereof. These densities are residential density—number of dwellings per hectare—and built density—main use built-up area in square meters per hectare—. Areas corresponding to garages, storage rooms, etc. are deducted from the built density calculation, in order to get a value as close as possible to the urban planning concept of buildable, different from cadastral areas, which are defined for tax purposes.

The relationship—percentage—between the surface for residential or industrial uses with respect to other typological uses was obtained from the surfaces by type, differentiating residential units and those with an industrial profile for their different treatment in terms of urban standards. It allows to design a complete set of data required to characterize the profile of each urban unit and to compare them, highlighting possible imbalances or misalignments between their densities, functional variety or services level, both of facilities and public open spaces. These characterization data include the population density—inhabitants per hectare—, the residential and industrial densities, the relationship between areas for offices, retail, hospitality or other types and the total area of main use and the surfaces occupied by facilities and public

open spaces —in square meters— per 100 built-up square meters of main use, per capita and per household (figure 2).

**Figure 2. Maps of Population Density (Left) and Surface of Local Facilities (Right)**



Source: Authors

## Urban regeneration beyond isolated actions: looking for positive impacts on their urban environment

The urban diagnosis represented by the delineation and characterization of urban units has its counterpart in the programming of a series of actions aimed at correcting, as far as possible, the deficits detected in this diagnosis.

Obtaining equivalent indicators in all urban units avoids losing the city scale and facilitates an accurate representation of the relative position of each urban unit with respect to the rest. However, this work must be complemented by an approach to each urban unit in order to respond to their particular needs, by taking advantage of the opportunity areas that the fieldwork in the previous phase of analysis allowed to locate.

Starting from the precise knowledge of the existing city, a logic of systematic improvement of consolidated or semi-consolidated spaces was thus set, in order to correct deficiencies and foster positive interactions between neighbouring areas. All proposed improvements have to combine with each other to increase their positive effects. The target consists of carefully designing each individual intervention, so that the sum of all of them is consistent and contributes to improving the urban conditions of every urban unit. This resulted in a program consisting of different actions, depending on the characteristics of each area of intervention.



Although this program extends to the whole of the existing city, its effects especially unfold in those urban units that correspond to the more densified areas, where deficits related both to facilities and public open spaces are more serious. This is the case, for example, of urban units that correspond to the neighbourhoods of “Pajarillos Bajos” or “Delicias”, two of the densest spaces of Valladolid and that therefore received much more attention.

Thus, a first level of action corresponds to the so-called as “Isolated Actions”, applied in consolidated urban spaces and that consist of small corrections of alignments or roadway sections, in order to improve streets conditions, whether in terms of continuity, section, etc.

A second level corresponds to sectors in unconsolidated spaces, which consist of inner improvement micro-projects that take advantage of small empty plots and/or ruins or abandoned buildings. They pose more complexity than “Isolated Actions”, because some operations, such as re-parcelling, are required. The aim was to replace these "urban voids" by renewed spaces that would include new mixed-use buildings and, most importantly, small public open spaces or spaces intended for local facilities. For example, a sector in “Delicias” neighbourhood to be highlighted posed the elimination of substandard housing in the inner courtyard of a block in order to replace it by a parking area, one of the clearest deficits of this neighbourhood, and a space for the location of retail activities that would complement the predominant residential use (figure 3).

**Figure 3. Aerial Photography and Layout for Sector 25-02 in Delicias**



Source: Authors

Finally, “Building Rehabilitation Areas” and “Urban Regeneration Areas” were also proposed. They correspond to large homogeneous housing estates that due to the deficiencies in their materials suffer an important deterioration, which counsels to intervene in them or even in surrounding public spaces and streets. The delimitation of these areas has rather a recommendatory character and seeks to guide the investments of the various public administrations in support of rehabilitation and urban regeneration operations, with more flexibility.

For instance, in the case of “Delicias” neighbourhood, it was proposed a “Building Rehabilitation Area” that corresponds to the so-called as “Arca Real” Industrial Village, a 1,000 dwellings housing estate built in the sixties and currently quite deteriorated. Alternatively, the delimitation of an “Urban Regeneration Area” was also proposed, if in addition to the housing rehabilitation it is decided incorporating the underused courtyard of the “Juan de Herrera” Professional High School, in order to generate a new public square that would increase the very limited public open spaces inside the neighbourhood, while also allowing to incorporate underground parking for residents or new residential blocks on the perimeter (figure 4).

**Figure 4. Aerial Photography and Delimitation for Building Rehabilitation Area 26-04 in Delicias**



Source: Authors

This way, urban units become a diagnostic tool but at the service of an ambitious urban regeneration project in Valladolid, translating the indicators obtained in an operating program, aimed at producing a systematic improvement of the existing city.

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