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Beyond Multidimensional Vulnerability Approach: A Triple Network Notion for Urban Cohesion in At-Risk Neighborhoods of Jaen's Historic Center

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Abstract: Today's cities need more than ever methodological devices that ensure a specific urbanism, in keeping with the complexity of relationships that occur in the urban space. Networks or systems of a diverse nature must be activated to achieve a certain success of the city, even more so in its fragile central fabric. This study is focused on the historic neighborhoods of the city of Jaén (Spain), which have a high vulnerability index. The aim is to establish a strategy to revitalize their urban and social capital and improve their articulation with the rest of the urban and territorial structure. A methodological proposal for the analysis of vulnerability factors and an urban and cartographic analysis of the public space is addressed through an interweaving of a triple network: environmental, social, and urban. For this purpose, the configuration of this overlapping network of analysis and the formulation of criteria is presented, which considers the urban multiplicity and promotes new dynamics for the integrated urban regeneration of the area and for the activation of public and collective urban spaces.

Keywords: urban vulnerability; integrated urban regeneration; social cohesion; urban design; public space; sustainable planning; urban environment



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1. Introduction

The second decade of the twenty-first century has seen important economic and social transformations mostly because of the international economic crisis that began in 2008. A crisis that altered the order of urban and social problems, making socioeconomic vulnerability a practically generalized, complex, and chronic problem in countries such as Spain. The 'inherited urban and socioeconomic structures' accentuated the distance between the 'winners' and 'losers' of the crisis [1] (p. 2). This inequality hinders possibilities for more resilient dynamics, which in current post-pandemic scenarios becomes even more essential [2]. The results speak to the existence of a 'negative spiral' in which worse socioeconomic conditions lead to greater economic vulnerability and a concentration of elements that contribute to maintaining the situation of imbalance between the city's districts.

In recent years, we have witnessed a growing interest in building integrated perspectives of urban planning to combat situations of vulnerability and urban inequity [3–6]. Likewise, the literature highlights the increasing role given to public space and urban green systems for the well-being of people, urban health, and social cohesion [7–12].

Yet, despite the growing importance of urban vulnerability, social exclusion, and degradation of the natural and built environment in academic and policy contexts [13,14], and in the Spanish and Andalusian contexts [15–20], the established relationship between the urban space and the capacity to reverse such situations of vulnerability is still unclear.

Integration between social sustainability and urban sustainability is one of the focuses of debate in the environmental international agenda [21]. Different authors establish an approach to the conditions of the urban form that directly influence social sustainability [22].

Working definitions and evaluation frameworks for assessing the social sustainability of urban areas have been proposed by academics. However, frameworks that provide a more thorough structure for study are required to link the qualitative and quantitative dimensions of social sustainability [23]. The neighborhood scale as the smallest urban scale through which to study and solve social problems is indicated [24], while access to facilities, living space, and social interaction as key aspects for the improvement of citizens' perceptions of urban security and satisfaction are highlighted [25].

From a theoretical perspective, this paper aims to delve into these intertwined dimensions that are sustained in the urban space, represented mainly by various networks based on the urban public space and its relationship with the fabric of urban facilities. This in turn makes it necessary to reflect on the multidimensional nature of public space and its capacity to articulate future transformations of neighborhoods or areas of cities. The relationship between urban regeneration and social cohesion has been widely studied as one of the fundamental characteristics of social innovation [26]. The fact of favoring the meeting of people, diverse actors, and institutions is necessary to lead to a social change beneficial to society [27]. As a support for the development of the characteristics of social improvements (networking, social relations, collaboration, and social cohesion), public space would therefore be key in contexts in need of urban regeneration, such as vulnerable neighborhoods. This requires making the spatial network visible and defining its shaping characteristics, while also pursuing the definition and visibility of its social and environmental systems or networks, and the evaluation of its potential in urban regeneration policies.

Consequently, we hypothesize that it is in the urban physical structure where both social factors that make up collective spaces and their environmental factors are most clearly manifest. Thus, beginning with an in-depth analysis of public space, we evaluate social and environmental factors together with a subsequent planning of actions that would facilitate the regeneration of both the social and environmental fabrics.

Considering this hypothesis and focusing on vulnerable urban areas, the following series of guiding research questions are defined, which at the same time allow us to develop the theoretical objective formulated above: (i) How to produce a vulnerability analysis of a domain that has pre-existing spatial conditions? (ii) What role can public space and the urban network assume that would make it function systemically in urban regeneration? (iii) How does the interaction take place between the 'spatial offer' of the observed city and the intervention strategies that combat its social and environmental vulnerability?

The paper begins with the contextualization of the regeneration strategies that can serve as a reference framework for the case study. Secondly, the paper analyzes the role that public space and urban green infrastructure can play in social cohesion, under the hypothesis that equal access to resources and services directly affects the reversal of urban vulnerability situations. The characterization of the Barrios Altos of Jaén is addressed through the following two approaches: (1) a methodological proposal for the analysis of vulnerability factors; and (2) an urban and cartographic analysis of public space in a broad sense, as a potential offer for the configuration of operational urban networks.

The remainder of the paper is organized as follows. In the next section, the situation of vulnerability of the case study is exposed and the foundations are laid for each of the networks (urban, social, and environmental). We consider (1) 'public space nodes' as places of social interaction for the strengthening of self-esteem and the emergence of participatory initiatives and policies, (2) the extension of favorable conditions of the peri-urban environment annexed to the whole area through a discontinuous but linked environmental classroom, and (3) the urban recovery and the promotion of a greater number of diverse functions. This paper ends with an analysis of the results and several conclusions for this case, and for the application of this methodology in general, through the integration of networks based on the cohesive and multidimensional value of the pre-existing public space.

2. Literature Review

The concept of vulnerability can be defined as a state of high exposure to certain risks and uncertainties in combination with a reduced ability to protect or defend oneself against those risks and uncertainties and cope with their negative consequences. Vulnerability exists at all levels and dimensions of society and forms an integral part of the human condition, affecting both individuals and society as a whole [13]. Understood in this way, vulnerability is the prelude to social exclusion, poverty, and the breeding ground for the decline in residential urban areas, combining spatial dimensions and social structures, linked bidirectionally [7,28]. The European studies of the early 1990s on the return of urban poverty explore it as a multidimensional phenomenon, not just an economic one [29]. This lack of welfare is defined by an intersection of a lack of access to the state, the market, and solidarity/community/family, in a process heavily dependent on urban space and local neighborhoods [30,31].

The unequal endowment and quality of public space in different areas of the city is one of the testimonies of existing social and spatial segregation processes and an added vulnerability factor, which contributes to the perpetuation of underprivileged neighborhoods. According to Alguacil et al., ‘the vulnerability of a territory combines objective factors and subjective factors; on the one hand, it is constituted by conditions of social disadvantage, and, on the other hand, it is a psychosocial environment that affects perceptions that citizens have of the territory in which they live’ [18] (p. 79). For this reason, vulnerability must be understood as contextual and linked to a specific territory.

The concentration of poverty in at-risk or vulnerable neighborhoods of cities is one of the main problems in the European Union today. Much evidence indicates this, such as the ‘Seventh Report on Economic, Social and Territorial Cohesion in the EU’, which indicates that the risk of poverty or social exclusion remains a key challenge, especially in the Baltic and southern Member States. In addition, the risk of poverty or social exclusion is placed at levels higher than those prior to the crisis (2008–2011) in the cities of countries that joined the Union before 2004 [32] (p. 16).

2.1. Urban Regeneration Strategies in the Context of Research

Instruments like The URBAN Community Initiative [14] have allowed different states to develop urban regeneration strategies in ‘neighborhoods in crisis’ up to 2006. Furthermore, in the Spanish context, URBAN contributed to incorporating concepts that at the end of the 20th century had not yet been widely introduced into the practice of urban regeneration. Among them, we would highlight the ‘integrated approach’ including the following: (1) the need to address the problems of cities through collaboration between institutions (and between different levels of government); (2) the need to involve the population and local stakeholders through participatory processes; and (3) the introduction of a vision of urban regeneration based on the concept of sustainable urban development [17] (p. 45).

The strategies had to act from an integrated perspective at all dimensions of degradation (social, economic, environmental, governance, etc.), and ensure action-initiated changes that would overcome periods of decline and the approach of traditional urban policies that are merely spatial or sectoral. It was intended to consolidate new dynamics of urban sustainability assuming a heterogeneous and complex urban reality [3,4].

The main objective of urban regeneration is to increase the well-being of residents by proposing not only improvements to the physical space, but also through achieving social cohesion and identification with environmental and economic as well as social and cultural development [33]. When regeneration strategies in central areas have consisted of mere physical and ‘urban transformation’, this has given rise to gentrification processes, disregarding the pre-existing population, and seeking standards that provoked drastic transformations of the social fabric. The economic transformation and investments in historic centers have often come before social policy, entrepreneurship, and training in the productivity of residents. In turn, this has led to the abandonment of daily life in these areas and their outsourcing.

On the contrary, urban regeneration strategies must increase the local capacities of the pre-existing population to ensure true ‘resistance’ that has been shown many times as an alternative to deterioration and gentrification coupled with top-down ‘urban renewal’ projects [34].

In this sense, it is worth mentioning two examples of rehabilitation plans for historic neighborhoods that have tackled the problem collectively, emphasizing neighborhood retrofitting and the improvement of public space structure and conditions: the Special Plan for Safeguarding Mouraria, Lisbon [35] (Figure 1) and the Rive Gauche Rehabilitation Project, Molenbeek, Brussels [36]. In both cases, the introduction of new collective facilities was a central objective for improving the living conditions of the resident population and their permanence, while pursuing the integration of the new population. The economic revitalization was tackled through the diversification of functions and the protection of traditional uses, promoting new activities housed in newly built buildings. In both plans, the prolonged time of the implementation process allowed for the adjustment between physical transformations and their assimilation by the population, also allowing the evaluation of the effects of each phase.



Figure 1. Mouraria case study. (Left) Lisbon’s special safeguard plan: alteration of spaces and buildings. Source [35]. (Right) Reabilitação Urbana da Mouraria. Source: [37].

Urban policies that demonstrate the need for territorial governance criteria as a working method implies, for its design and execution, establishing collaboration and coordination mechanisms with other levels of government and with the civil society [5].

2.2. Urban Cohesion and Urban Open Space: Dimensions of Public Space for a More Cohesive City

In cases such as the EUROsocial Program, social cohesion was associated with a model based on social justice, the primacy of the rule of law and solidarity [38]. In other words, the European concept of cohesion has been based on social rights and equal access to resources and basic services [39]. Likewise, policies in favor of social cohesion would tend to enhance the economic possibilities of the population through employment and improve their levels of integration and social bonding. Moreover, the issues raised by Maloutas and Pantelidou (2004) on the ambiguity of the concept of social cohesion and

the variable impact of cohesion promotion in different socioeconomic situations need to be considered. We would speak, in this sense, of social cohesion as a reinforcement of social capital and urban resilience in the area:

“The rationale for policies promoting cohesion is linked to the form of local social interaction that should be improved through increased engagement in formal and informal networks on a mutuality and solidarity basis, leading to the formation and/or the reinforcement of a social capital without which the feasibility of collective improvement strategies (practically perceived as local regeneration) would be reduced”. [40] (p. 451)

In the spatial framework of cities, this combination of opportunities and challenges requires the integration of strategies to obtain a recognizable impact on them. For example, improving urban transport can reduce congestion, make firms more productive, and connect deprived neighborhoods; institutes of higher education can help to integrate migrants, promote innovation, and provide skills missing in the local labor market; nature-based solutions, such as urban green spaces, can improve quality of life, air quality, and biodiversity [32] (p. xvi). In this sense, urban ecosystems and green infrastructure would fulfill an important social function in improving the integration of socially vulnerable groups [9,10]. The role of spaces linked to an increase in biodiversity and the provision of multiple ecosystem services is essential for creating a greater sense of community, helping to combat social exclusion and isolation [32] (p. 115), and for improving the integration of ethnic minorities, especially among younger groups [41,42].

The main capital for strengthening urban ecosystems and green infrastructures is free urban space, mainly the public space. That is why it is necessary to understand its current situation and its increasingly diverse dimensions to achieve such regenerative capacities.

Furthermore, the incorporation of the biodiversity concept into urban planning has been modifying priorities and placing urban open space at the center. Recent perceptions emphasizing the infrastructure approach also represent a more socio-economic perspective, offering the potential to address the economic value system of spatial development [43] (p. 7). As noted by Meerow and Newell, it is these multiple benefits and resulting synergies that allow the green infrastructure approach to provide an “opportunity to enhance social-ecological resilience and equity” [44]. The proof of this is its consideration as an interconnected component that guides sustainable urban development integrated into the new urban agenda [45], and the central role given to public space for social and economic development [12]. In this same vein, Parris et al. could establish a multidimensional relationship between the concepts from one or more built-environment disciplines and the objectives that contribute to the increase in biodiversity in cities, which were expressed as metaphorical targets [46]. In this diverse system of relationships, the dimensions, such as heritage, mobility or safety, health, and well-being of people, involve the integrated participation of the social and the environmental. Here, the urban space and the green and social infrastructure of habitat development in general are the scenarios for the achievement of these objectives [46] (p. 45).

Understanding the ecosystem function of urban open space and, mainly, the components of the potential green infrastructure must entail a search for connectivity for integration into networks. In fact, in the definition and understanding of the term green infrastructure, great importance is given to the high quality of these elements and their membership as an essential part of an interconnected network [43,47]. This network structure is precisely what gives systemic capacity to the diverse set of initially isolated territorial spaces and resources [42] (p. 16). We would be talking about a very broad catalog of elements that would encompass practically all the unbuilt space, the biophysical or “floating” matrix of free spaces [48] (pp. 35–36), which must be seen as a single interconnected system.

On the other hand, in favor of social cohesion, for the appropriation of public space and for the fulfillment of its function as a social articulator of the network it forms, it can be achieved through the integration of different actions and urban design criteria [11] (p. 3). These criteria would respond to a threefold spatial, institutional, and socio-cultural

dimension that is key in the sustainable development between cities and their environment, contemplating issues related to planning, management, functionality, and the socio-cultural. In the Spanish planning context, there are good examples of reinterpretation of pre-existing public space to create a social articulator that strengthens cultural identities. In the Special Plan for the Historic Center of Toledo (1998), the 'Mediterranean patio' became the catalyst for the revitalization of daily life, as the lungs of the city, and for the location of new viewpoints [49]. The studies for *La ciutat vella de Barcelona* [50] identified a set of urban sequences that linked meaningful public spaces, which would make it possible to reinforce neighborhood identity, and make the spatial and commercial values of Ciutat Vella visible.

3. Materials and Methods

The research focused on historical capillary fabrics, the keys to revitalizing its urban space, and the lack of identity and true functionality of an annexed forest park, in direct connection with a first-level heritage element. To this end, we addressed the conditions and capacities analysis of public space for the formulation of urban regeneration strategies, understood as a multi-relational system: the network system and a set of elements that constitute a physical environment of collective expression and social and cultural diversity [51], and of a multidimensional nature [11]. Networks are presented as one of the hallmarks of urban regeneration that works on the social innovation of an urban fabric [26], as networking can build shared interests, reciprocal support, and mutual benefit with each partner contributing according to their respective resources, strengths, and areas of expertise [52]. Public spaces, from this integrated vision, incorporate their social and cultural value into the general context of the area, conforming themselves as nodes of the system prepared to be able to be incorporated into the network of scenarios of daily life in the city [53].

To carry out this spatial and thematic reformulation, it was necessary to identify a public space structure that has the capacity to provide urban and social cohesion. We have previously shown the close relationship between the social and urban problems of vulnerable neighborhoods and the loss and deterioration of their public space. On the other hand, lack of connectivity or membership in broader social networks leads to less access to services and opportunities. For this reason, in an inverse relationship, the public space and the social network project have the capacity to activate urban regeneration dynamics, for which it is necessary to identify key network places that articulate the urban functions and symbolic representation of the community. They would be what Ruben Kaztman [54] referred to as 'structures of opportunity'; networks that can assist individuals transcend geographical obstacles and social spaces, giving them access to larger social circles [31] (p. 1069). Later, such networks will be studied using a cartographic analysis of spatial/urban resources.

For all the above reasons, the study framework must be in a recognizable territory where there are also contrasted sources that make it possible to obtain a significant amount of information that would otherwise be impossible to obtain in an investigation starting from scratch. Therefore, we chose to work on certain vulnerable neighborhoods that were included in the framework of the national urban vulnerability study. Considering this, the methodology proposed for the vulnerability analysis, based on the data banks that will be detailed later, which will be sophisticated in the research with the approach to a list of national and international studies. These indicators of urban vulnerability, developed from those available for obtaining objective data [55], are contrasted and weighted by means of methodologies of a sociological and cartographic approach.

The methodological framework of the work focused, beyond the detection of the degrees and types of existing vulnerabilities, in a first approximation, according to the studied census sections of Jaén's neighborhoods, on the definition of networks that precisely combat such vulnerability, betting on urban and social cohesion, based on the recognition of the resources of the area. For this purpose, an analysis of the spatial resources, the 'spatial offer' of the area, was carried out as well by means of a cartographic analysis. The second approximation granted a relevant role to research through the project [56],

for the identification of such a spatial network and for the assignment of roles to the different spaces of opportunity within the framework of the urban regeneration strategy. This overcoming from theory to practice would mean a great advantage over other merely descriptive and interpretative analyses of risk situations in urban environments, trying to bridge the gap between the analysis of reality and its intervention, building a methodology that is based on the rereading of urban spaces and their capacities, considering the intertwined dimensions addressed.

3.1. Case Study: The Altos Neighborhoods of Jaén's Historic Center

This part of the city is defined by abrupt topography, on which the historic neighborhoods that constitute the southern limit of the city are built, located on the old national highway or Paseo de Circunvalación, which crosses the slope from east to west and provides access to the castle (Figure 2).



Figure 2. (Left) Ring road. (Right) Street with the highest slope belonging to the Barrios Altos. Source: authors.

A strong topography and fringe condition added to the lack of diversified activities and unemployment of the population has resulted in the marginalization of the San Juan and San Bartolomé neighborhoods with respect to the rest of the historic city [56], together with a process of physical degradation, depopulation, and the appearance of a large number of plots and building walls in poor condition. Indeed, the ‘Atlas of household income distribution’ carried out by the National Employment Institute highlights the income gap between the poorest neighborhoods (San Juan, La Magdalena, San Bartolomé, and La Judería) compared to the richest neighborhoods in the new urban expansions, reaching a EUR 50,000 difference in family income [57]. This has caused an emergency that requires ideas to reverse the trend protecting the social fabric, revitalizing, enriching, and valuing the urban and architectural fabric.

Actions have been carried out through the URBAN 2006 community initiative and through the Regional Urban Initiative (2007–2013) financed with the European Regional Development Fund (ERDF), intending to develop innovative strategies for urban regeneration [17]. They did not have the expected dynamizing effect of inciting the citizens themselves to promote measures with a greater dose of reality and collective value of their public spaces. One example is the ‘reAviva’ Jaén movement, which has carried out projects such as #verDEA or #PlazaCambil, or the #PROYECTOReAcciona project [58]. Another relevant episode occurred because of the reflection on these historical fabrics on the hillside of Jaén, Spain, produced for the Ideas Contest for the Strategy of Dynamization and Recovery of the Historical Complex of the City of Jaén, organized by the Jaén College of Architects. This idea would be incorporated, as the competition winner, into the city’s

overall urban planning, which would go into effect in 2016. The goal of the 'Parkway' project, which was incorporated into the urban plan, was to highlight the original position and challenges of the urban, natural environment, and infrastructural fabrics and areas that required an urban solution, as well as the solutions produced [59]. These projects tried to transform the growing number of abandoned lots in the historic complex of Jaén into public spaces born, according to the project, 'of citizen participation, self-management, institutional-neighborhood co-responsibility, creativity, respect, imagination and social innovation' [58].

Beyond these initiatives, a true sustained and integrated strategy is necessary to update the city's central urban fabric. This could only be developed within an urban planning framework which Jaén has fallen behind on, still having its Urban Plan from 1996.

3.2. *Multidimensional Approach to Urban Vulnerability*

In the city of Jaén, neighborhoods such as San Vicente Paúl or Magdalena-San Juan are classified as 'disadvantaged areas' by Egea et al. [16]. That is, areas that present a series of weaknesses in sociodemographic structure and/or in environmental qualities, a complex situation resulting from a lack of resources that prevents the areas from enjoying a quality of life equal to other areas of the city [60]. On the other hand, the Urban Vulnerability Observatory [61] includes in its Catalog of Vulnerable Neighborhoods of Spain 2011, the vulnerable statistical area San Juan, including the neighborhoods of La Merced, Centro, San Bartolomé, San Juan, Judería, San Miguel, and La Magdalena (Figure 3) that constitute the object of study. The Urban Vulnerability Observatory is a long-term project of the Ministry of Development, which accommodates different studies related to urban vulnerability, in development of the provisions of the Land and Urban Rehabilitation Law [62]. The levels of net income per person shown in Figure 4 (data from 2018) show the sustained situation of precariousness, unequal even in respect of other neighborhoods in the historic center.

The list of factors used addresses the multidimensional condition of urban vulnerability, endorsed by numerous studies since the beginning of this century that define it as a difficult and disadvantageous situation in an urban area because of all kinds of barriers (economic, social, environmental, and also cultural) [13]; a situation that is, in addition, a contextual inequality in the city, preventing the integration and participation of members of social groups from that urban environment [13] (p. 12).

As is the case with social sustainability or, to a certain extent, social cohesion, which could be considered the other side of urban vulnerability, qualitative and quantitative dimensions are interlinked and interconnected [23]:

"A socially sustainable environment has a dialectical character [...] physical qualities and standards are positively perceived, highly valued and interactively utilized by the residents through sustaining and enduring social practices, [...] a place where substantial social qualities are sustained, highly valued and vividly exercised within an urban setting of high physical quality". [23] (p. 4)

Specifically, this research specifically connects with previous studies in the Spanish context that groups vulnerability factors into blocks [6,16,18–20,39], and which are the basis of the Urban Vulnerability Observatory [61]. This allows, for a majority of determining factors, access to the data collected by the observatory which are progressively updated, being the data available, and depending on the factors used, corresponding to the 2001, 2011, or 2018 census sections.

The dimensions at the base of urban vulnerability are socioeconomic and sociodemographic, which form the two groups for the main indicators. However, other factors are also considered that would reduce the ability to overcome, individually and/or collectively, emergency or risk situations that would hinder social integration or increase social vulnerability, factors that incorporate dimensions relating to the institutional, environmental, and urban conditions of the neighborhoods considered [16,19,20,32,39].

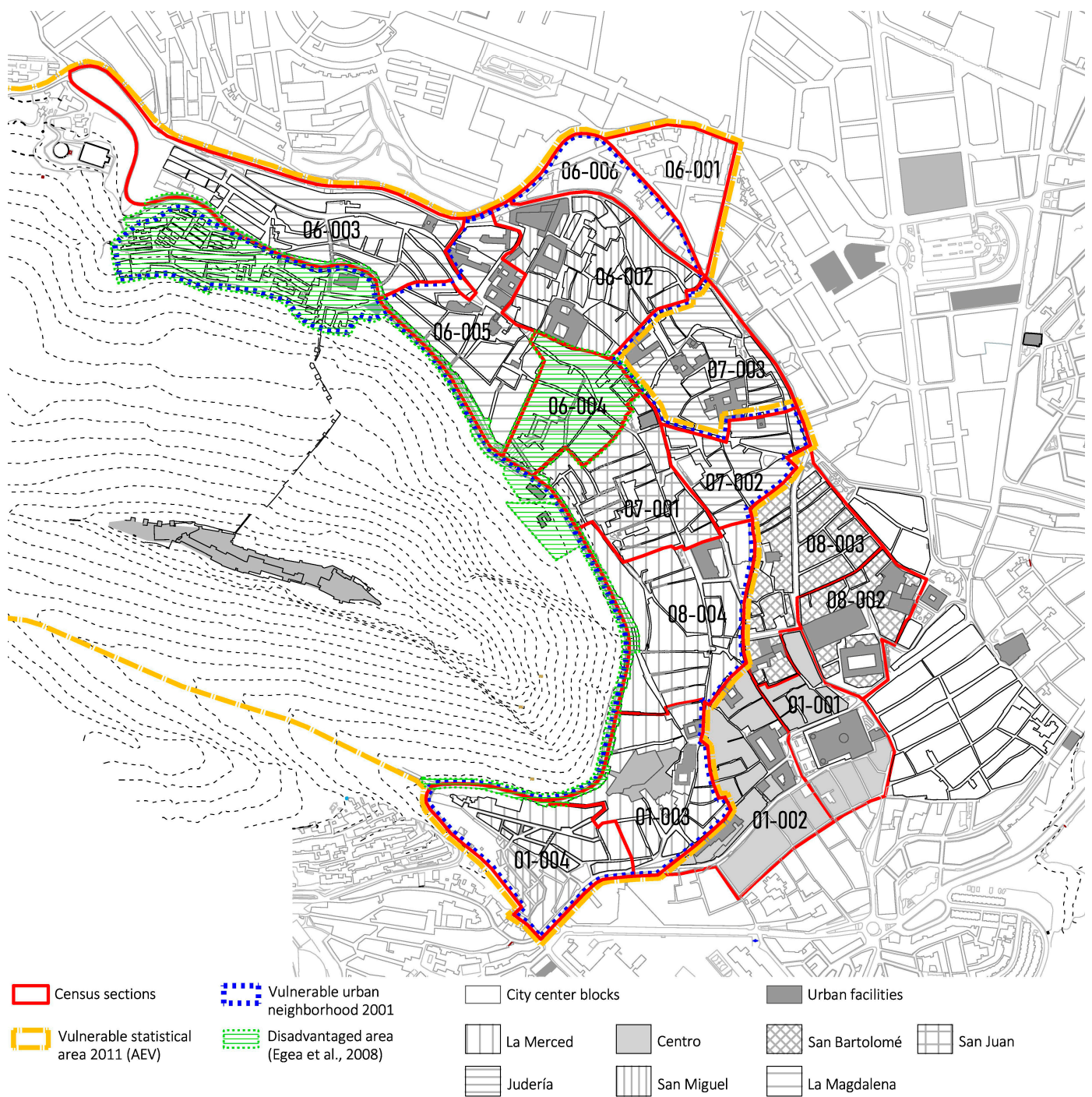


Figure 3. Names and locations of the neighborhoods and census sections of the Barrios Altos of the historic center of Jaén; ‘Vulnerable urban neighborhood’ and ‘Vulnerable statistical area’ according to AEV 23050006, ‘San Juan’ [61]; limit of ‘Disadvantaged area’ according to Egea [16]. Source: authors.

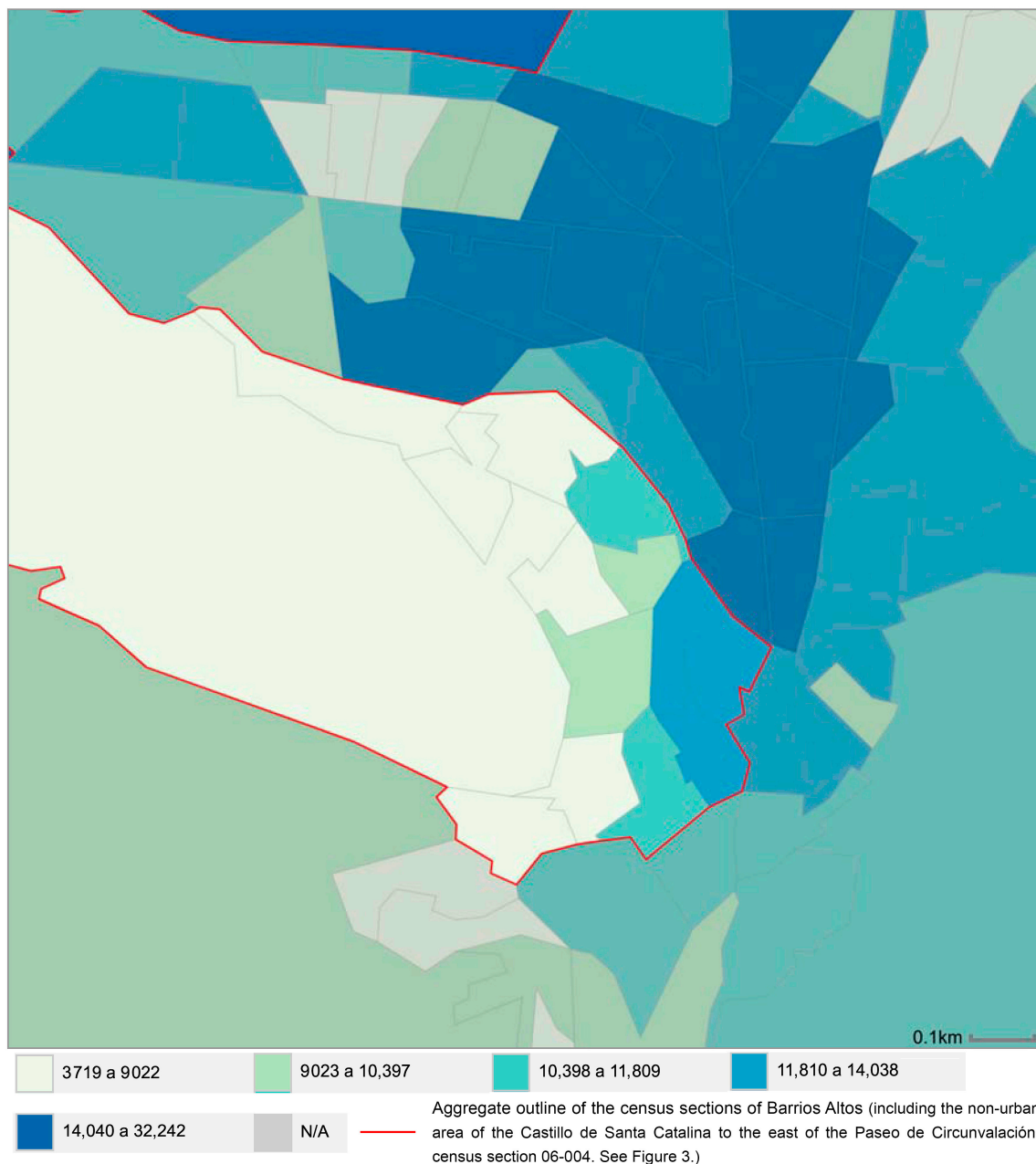


Figure 4. Net income per person (2018) (EUR), according to the Atlas of household income distribution of the National Institute of Statistics. Source: [60].

The treatment of the vulnerability of this area was carried out through a methodological proposal that followed three criteria: (1) the need to establish dimensional blocks that group the factors into ‘thematic’ vulnerabilities; (2) the integrated vision of these dimensional blocks and the understanding of the interrelation of some factors with others; and (3) the simultaneous consideration between dimensions of vulnerability and potentialities that anticipate desirable regeneration policies. For this, four, dimensional blocks are presented, as follows: I. economic factors; II. social factors; III. physical factors; and IV. subjective perception (see Figure 5). Table 1 describes the vulnerability factors that make up each block, the indicators that compose it, as well as the participation of each indicator in the different data sources and/or documents used and interpreted, or the own methodologies developed.

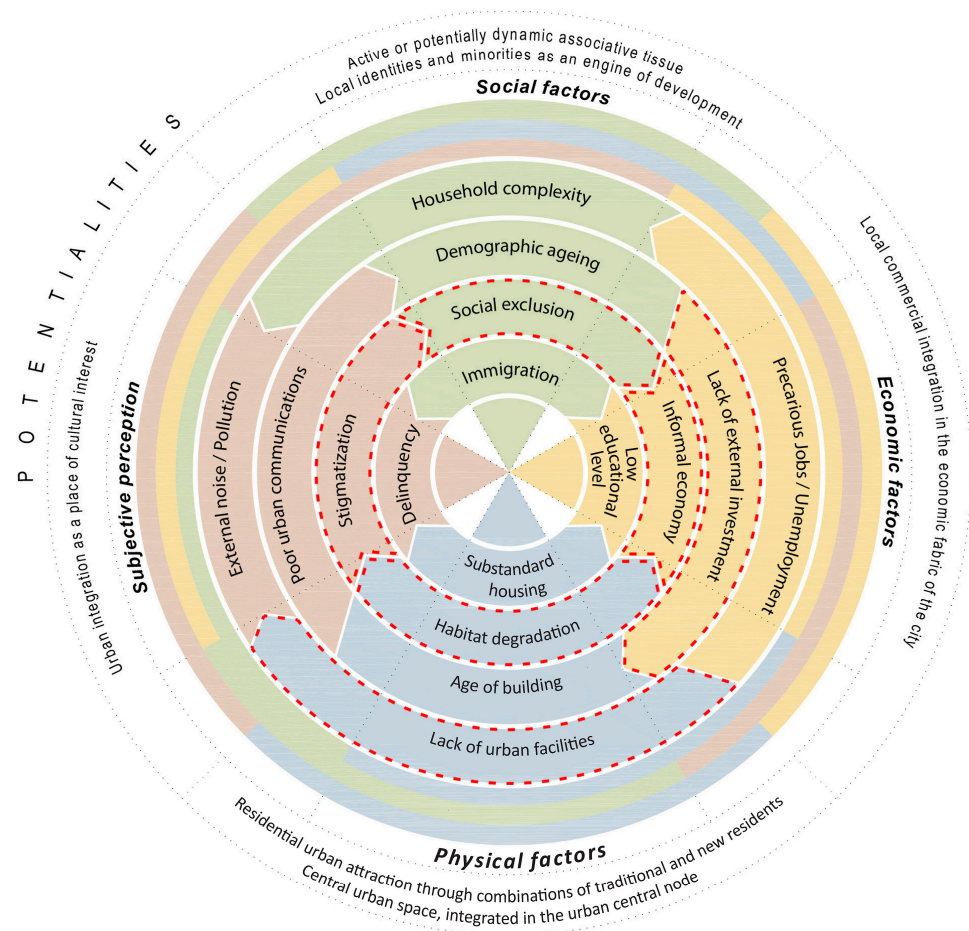


Figure 5. Pie diagram representing multidimensional urban vulnerability. Source: authors.

The interdependence between social and economic vulnerability is a consensus in the revised theoretical framework, even though the resolution of its social problems cannot be deduced from the mere economic growth of an area [13]. The proposed methodological diagram seeks to obtain a wide perspective of vulnerability that responds to the interdependence of factors between blocks. It is a kind of ‘circle or spiral of dependency’ in which situations of social, labor, and income disadvantage, together with environmental and citizen perception, combine and reinforce each other [18,19].

For each of the ‘thematic vulnerabilities’, some ‘hybrid factors’ were proposed, resulting from interdependencies with the other dimensional blocks, and fulfilling the following two objectives: (1) sector completion, and (2) an increased interrelationship between blocks that make up the multidimensional analysis, being the first step for the consideration of spatial quality and its effects on the analyzed disadvantage situations. The following factors apply to all blocks: (I) social exclusion; (II) the lack of foreign investment and the submerged economy; (III) the lack of urban facilities and habitat degradation; and (IV) symbolic stigmatization (Figure 5).

The results obtained through this application of sophistication to the multidimensional approach to urban vulnerability will be used in each of the approaches (social, environmental, and urban). The various degrees of vulnerability will be located in the different census sections of the observed neighborhoods, according to the dimensions and indicators of the diagram. These greater or lesser differences between areas will in turn be used to interpret and calibrate the urban facts through the second methodological approach: the analysis of the spatial supply of the place, carried out via a cartographic approach.

Table 1. Vulnerability factors of the methodological diagram: component indicators, main sources, and alternative and own sources.

Dimensional Blocks	Vulnerability Factors	Main Sources		Own and Alternatives Sources		
		1a Urban Vulnerability Observatory 2001/2011	1b Urban Vulnerability Observatory 2018	2a Public Survey [*]	2b Cartographic Approach	
Social Factors	Household complexity	% Single-person households over the age of 64	a	Public survey	a	
		% Households with one adult and one child or more	a			
	Demographic aging	% Population over the age of 75	a			
	Social exclusion	Net income per person	b			
Immigration		% Foreign population	a			
		% Foreign child population	a			
Economic Factors	Precarious jobs /Unemployment	% Unemployed population (BIVU)	a	Lack of urban facilities State of conservation of urbanization and public space Lack of housing policies	b	
		% Unemployed youth population	a			
		% Temporary employment	a			
		% Unqualified employment	a			
	Lack of external investment					ab
						ab
Informal economy		% Temporary employment	a			
		% Unemployed population	a			
		% Population with no schooling/very limited schooling	a			
Low educational level		% Population with no schooling/very limited schooling (BIVU)	a			
Physical Factors	Lack of urban facilities			Lack of urban facilities	b	
	Age of the building	% Dwellings in buildings constructed before 1951	a	State of conservation of urbanization and public space Lack of urban facilities	ab	
	Habitat degradation	% Dwellings in buildings in a poor state of conservation	a			b
	Substandard housing		% Dwellings with less than 30 m ²	a		
% Dwellings without toilets or bathrooms			a			
Subjective Perceptions	External noise/Pollution	% Population with problems of external noise	a	Public survey	a	
		% Population with problems of local pollution	a	Public survey	a	
	Poor urban communications	% Population with problems of poor urban communications	a	Cartographic approach	b	
	Symbolic stigmatization	% Population with problems of lack of green areas		a	State of conservation of urbanization and public space	ab
				a	Public survey	a
Delinquency		% Population with problems of local delinquency	a	Public survey	a	

[*] Public Survey: J. A. Catena, an architecture student, conducted a public survey in the neighborhoods involved in the Final Degree Project “The social perspective to regenerate the historic city” under the direction of Belén Bravo Rodríguez in 2021 and 2022. The survey included field visits with neighbors, 4 interviews, 77 surveys, and analysis of the local press.

3.3. Cartographic Approach to the Programmatic Potential of Urban Space

The research is based on a broad and comprehensive conception of vulnerability that is linked to definitions of risk that involves both territories and social groups, thus recognizing an identification between space and social structure [18]. Also, from the economic sciences, the contemporary city is understood as ‘organization spaces’, ‘network spaces’, or, even,

‘constellation of places linked with different functions’ [33,63,64], where the urban economy and territorial context directly intersect. In this two-way relationship, the material with which urbanism can specifically work is the public spaces, taking advantage of its capacity to accommodate various uses and its adaptability over time [65]. Even more so in relation to the historical fabrics, the main challenge for the future of the public spaces will be to establish a correct balance in its spatial, social, and functional dimensions, in relation to its emerging dynamics—positive and negative—achieving the necessary coexistence and diversity [66,67]. It would be about emphasizing those values, qualities, or specificities that urban design possesses and about documenting its profound base in a reticulated social and cultural landscape.

Faced with fragmentation, isolation, and inequalities, the methodological proposal builds continuities or a complex system of ‘micro-histories’ [68]. This transforms the city with new ecological links, of movement, of centralities, of culture, landscape, and crossroads. The existing city is studied as a multiscale and broadly encompassing point of departure, and yet one that is attentive to local voices and responsive to change [69]. It would be about exploring the potential that urban forms contain to solve problems, reformulating pre-existing spaces and their relationships in search of a certain ‘rhizomic assemblage’, that ‘mixes the concept of the narrative path of the individual with the networked or shared information of the group’ [69] (p. 78–153).

The cartographic approach carried out is supported by the following: (1) field work carried out in the neighborhoods studied, visits to take photographs and recognition of the social reality, verification of the situation of the built fabric and values and characteristics of the urban landscape by the authors and collaborators, as well as by students from the Higher Technical School of Architecture of Granada in various courses focused on this reality; (2) the documentary analysis of urban planning and historical maps of the center of Jaén; (3) the photographic interpretation of current and historical orthophotographs; and the considerations and conclusions obtained from the design of the multidimensional vulnerability approach presented previously (Table 1), and the pie diagram of dimensions and indicators provided in Figure 5.

Through this inquiry, the objective of revealing the networked urban form is pursued, using the ‘information embedded’ in it [70] (p. 460). The (re)interpretation of urban reality and cartographic inquiry make it possible to detect and propose free space networks with operational capacity; recombined space that is ‘in search of a program’, that is, is focused on the experience of territorial transformations as a part of a network of themes revolving around different spaces and social groups [71]. Paying more attention to the processes than to the urban forms, ‘re-signifying’ the cartography will suppose the following: (1) the observation and comparison of the different times in the studied area; (2) the decomposition of the elements of the plane according to their functional links; and (3) the directed juxtaposition of elements and their orientation, considering their interaction.

4. Results: Definition of Multidimensional Field Networks

These three thematic networks are first identified—the social network, environmental network, and urban or functional network. When operating over the same territory and with the same urban facts, the networks are observed as superimposed, studying contrasts and interrelations. There are places in the area studied which, when the actions of the three networks are added, are recognizable as urban nodes. This recognition is in line with the two directions of work within the urban context that Grahame Shane proposed in his ‘recombinant urbanism’. On one hand, the ‘deconstruction of the city section’, and on the other hand, ‘the open, multivalent, layered systems with distributed nodes’ that he finds in landscape urbanism today [72] (p. 77). These nodes are places that incorporate the collective and the narrative into network logic, ‘central nodes of activity’ claimed by Alexander et al. [73] (p. 164–167), places of reference with prior symbolic value that are reinforced with the multiple strategy of regeneration.

A multidimensional analysis was carried out (Figure 6), identifying the urban structures, identity features, main lines of communication with the rest of the city, and facility locations classified according to types and places with significant views of the territory. After the first diagnostic phase, the existing urban centers, active places and with a social concentration of collective activities and sociability, and notable axes of the urban fabric in these neighborhoods are also identified based on their functionality (Figure 6b,c). Connectivity with the center of Jaén was studied by identifying the intermodal and public transport stops, as well as the articulation between private vehicle parking lots and pedestrian routes (Figure 6d,e).

4.1. Social Network

The situation of the central high-rise neighborhoods of Jaén was analyzed according to social, residential, urban, and economic aspects, starting from the vulnerability factors that were defined in various studies [16,18–20,56,74,75] and from the data collected from the Urban Vulnerability Observatory (Catalog of Vulnerable Neighborhoods), and, particularly, from the Atlas of Urban Vulnerability 2001–2011 [59] (Figures 7 and 8).

Vulnerability in these areas is always multidimensional, based on the following four basic axes [18]: sociodemographic vulnerability, socioeconomic vulnerability, residential vulnerability, and subjective vulnerability. Vulnerability conditions were analyzed according to the proposed methodological diagram, referencing the main and own sources cited (Table 2), which includes the public survey developed for these same neighborhoods and the cartographic approximation elaborated.

With the data obtained, it is observed that in the area there are circumstances of vulnerability such as social exclusion and low levels of employment and education, which leads to a very high level of informal economic support, environmental degradation, and scarcity of services and urban endowments, resulting in an important symbolic stigmatization of the population.

Based on the results of the vulnerability study, the necessity of identifying a ‘social network’ that would make it possible to balance urban dynamics and help urban legibility becomes clear. The network enables involvement between the players, which could lead to new social, economic, financial, cultural, and political arrangements through a process built in a collaborative way and disseminated through knowledge sharing [26]. This network, supported by the recognition of qualities of the urban fabric—safe, multifunctional, and flexible—and in a series of capacities—the generation of a feeling of belonging, of conformation of social capital [76], etc.—is instrumental in combatting vulnerability through the constant revitalization of the environment.

Sociability requires the existence of a supporting social space together with the physiological provision of comfort [77], a sense of ownership and social justice in space [78]. In the central context of Jaén, one of the main objectives would be to strengthen the self-esteem of the social fabric, since it must support the remaining dynamics to be implemented, as follows: the generation of participatory dynamics, the promotion of initiatives of the population’s premises, and the actions of the administration that improve the inhabited landscape.

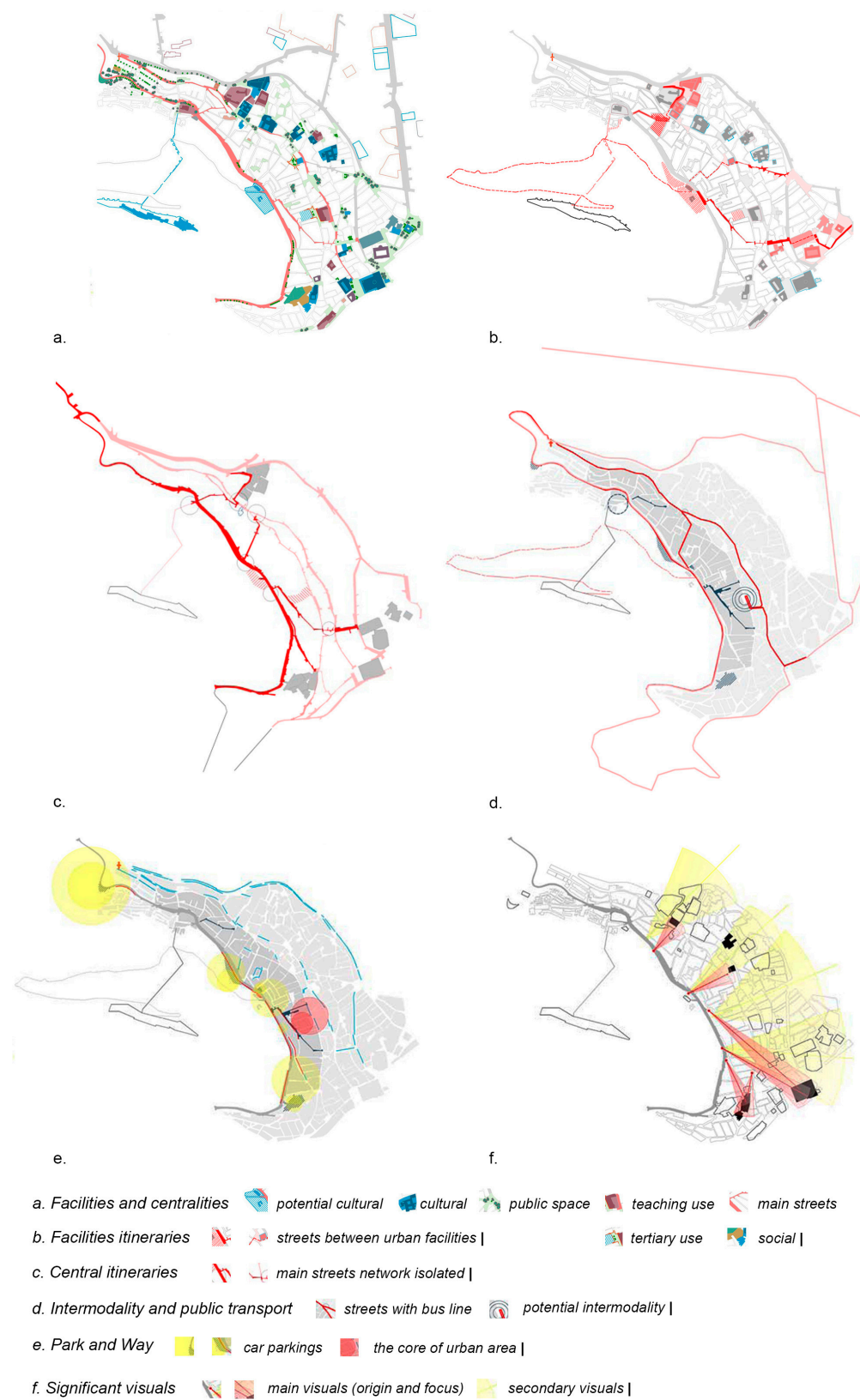


Figure 6. Multidimensional analysis. Spatial, morphological, and functional features of the Barrios Altos de Jaén. Source: authors.

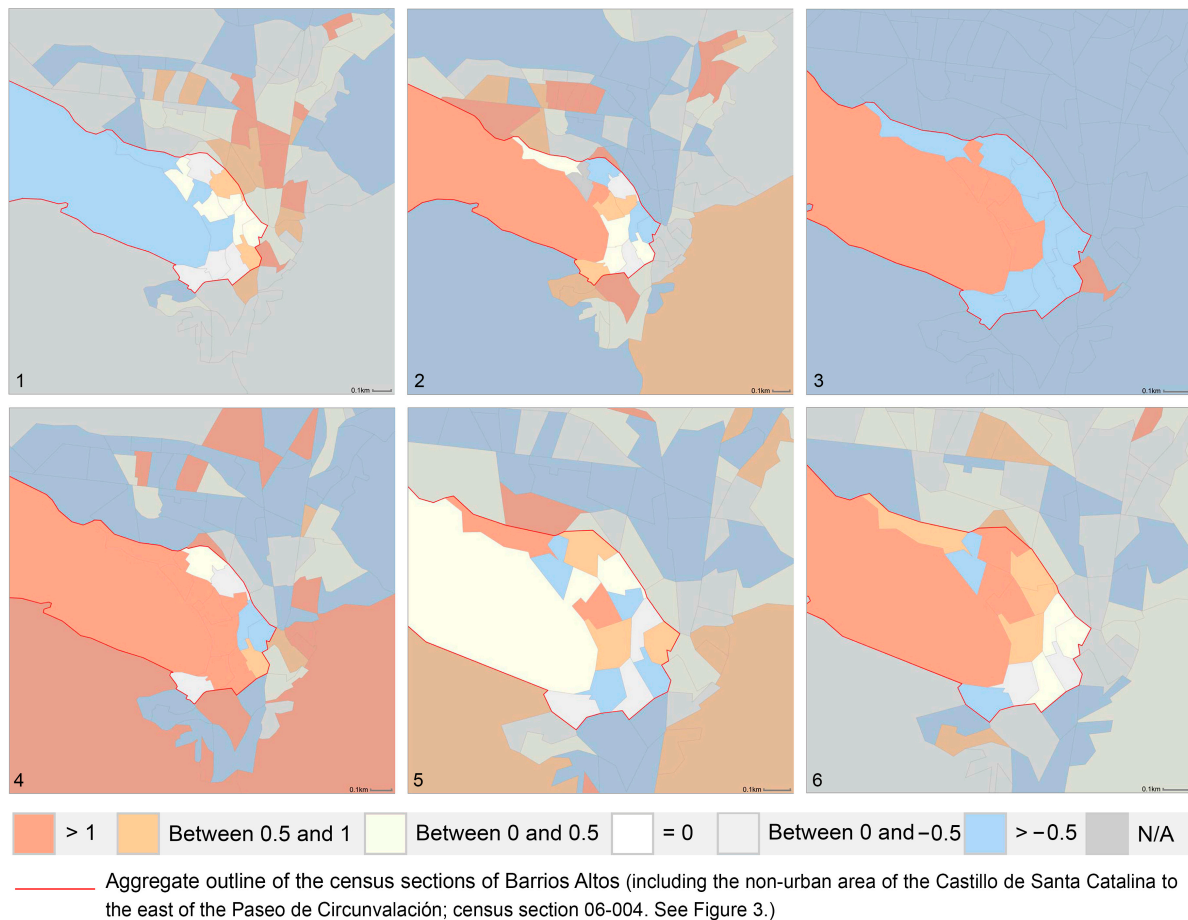
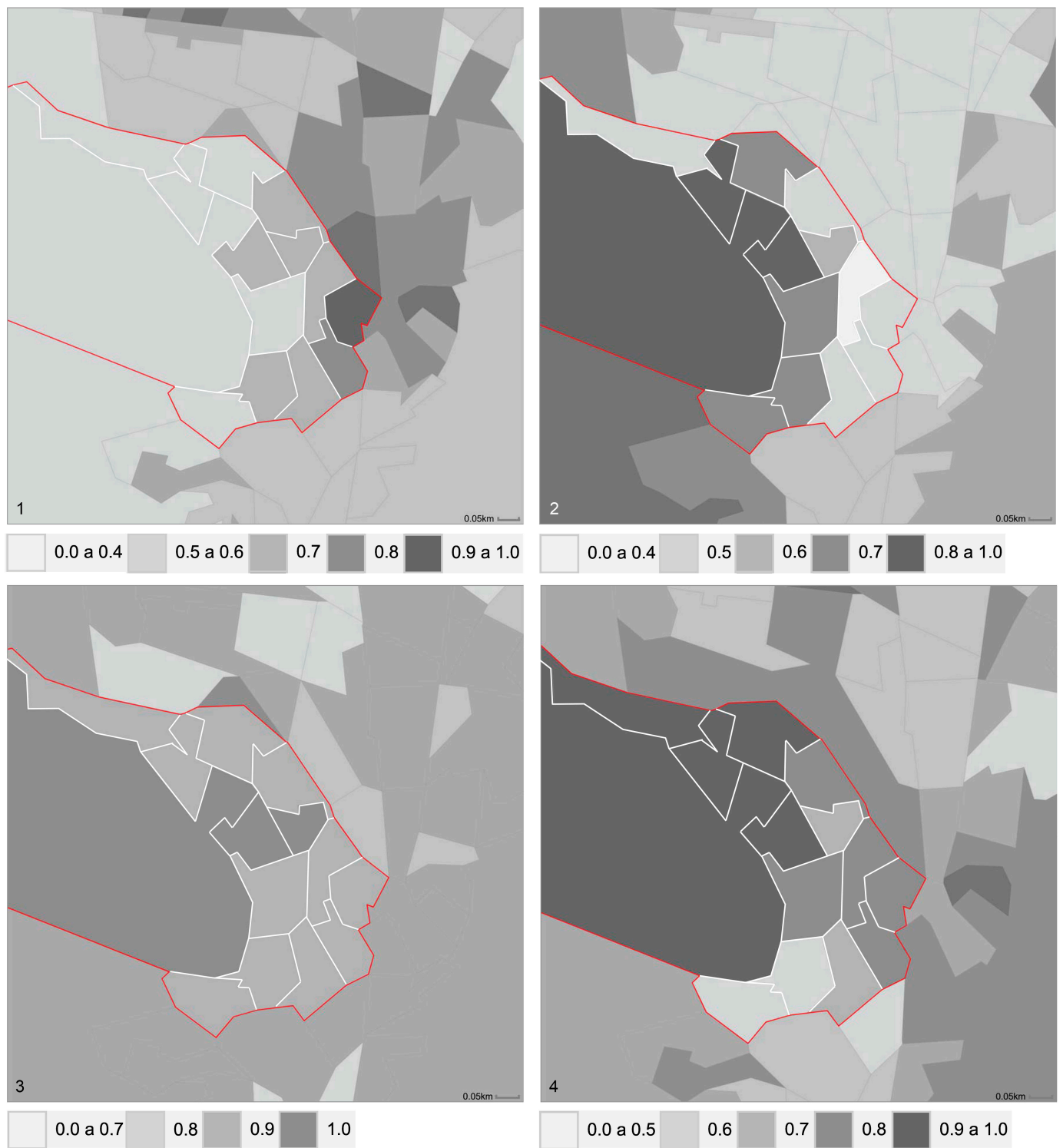


Figure 7. Contextual analysis of the basic indicators of urban vulnerability: (1) % single-person households over the age of 64; (2) % unqualified employment; (3) % dwellings in buildings in a poor state of conservation; (4) % dwellings without toilets or bathrooms; (5) % population with problems of poor urban communications; and (6) % population with problems of local delinquency. Source: collected and adapted by authors from Atlas of Urban Vulnerability [61].

The articulator of this strategy is, without a doubt, the public space. Understood in a broad sense, a significant part of the urban identity, and the capacity for social interaction depends on it. In this case, its degradation, and the lack of green spaces and facilities, is observed as one of the main features of the historic neighborhoods of Jaén (Table 2). The sum of the public and private spheres—the public and what we would call its environment—would constitute the ‘social space of the sphere’, in the sociological sense [79–81]. In the Barrios Altos, this social space is made up of both the main plazas and the stepped housing access and shared spaces and potential pedestrian streets (Figure 9), and for it to function as a network it must integrate the diversity of types of places, mixing and promoting diverse relationships, social engagement, and appropriation of space.



Aggregate outline of the census sections of Barrios Altos (including the non-urban area of the Castillo de Santa Catalina to the east of the Paseo de Circunvalación; census section 06-004. See Figure 3.)

Figure 8. Synthetic urban vulnerability indices, contextual multi-criteria classification by CCAA (Comunidades autónomas): (1) according to sociodemographic criteria (ISVU-SD); (2) according to socioeconomic criteria (ISVU-SE); (3) according to residential criteria (ISVU-R); and (4) according to subjective criteria (ISVU-S). Source: collected and adapted by authors from Atlas of Urban Vulnerability [61].

Table 2. Vulnerability detected in the historic neighborhoods of Jaén.

Vulnerability Factors		HISTORICAL NEIGHBORHOODS OF JAÉN													
		La Merced			Centro		SanBartolomé		San Juan		Judería		San Miguel		LaMagdalena
		01-004	01-003	08-004	01-002	01-001	08-003	08-002	07-001	07-002	07-003	06-002	06-004	06-005	06-003
Social factors	Household complexity	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Demographic aging	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Social exclusion	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Immigration	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Economic factors	Precarious jobs/Unemployment	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Lack of external investment	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Informal economy	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Low educational level	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Physical bar	Lack of urban facilities	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Age of the building	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Habitat degradation	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Substandard housing	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Subjective perceptions	External noise/Pollution	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Poor urban communications	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Symbolic stigmatization	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Delinquency	■	■	■	■	■	■	■	■	■	■	■	■	■	■

■ Less > High vulnerability levels according to the factor

Particularly vulnerable neighborhoods in the four dimensions



Figure 9. Basis of the social network: public spaces and shared spaces in the Barrios Altos. Source: authors.

4.2. Environmental Network

The representation of the environmental structure is twofold: registration of the urban–ecological elements and consideration of a logic for the future projection of the identified systems. A cartographic identification of open spaces with a capacity for ecosystem function and citizen use is carried out. For this, existing internal free spaces and of contiguous areas are selected: plazas, parks, wooded spaces inside public or private property, as well as the Santa Catalina Castle Forest Park. Empty lots inserted in the urban fabric are also considered due to their potential for temporary use and the urban axes or

itineraries that articulate the points and areas, ‘spots’ of the environmental structure [82]. A deficit of neighborhood green space is observed, with the quota of square meter per inhabitant well below the average of the nucleus, and access to nearby green spaces is difficult.

The improvement in ecological connectivity is based on the fabric’s potential to form a network of recreational or landscaped green spaces connected through itineraries and/or sequences of public space, which also represent a functional alternative to commuting in a private vehicle [42] (Figure 10).

The environmental network seeks to improve the integration of vulnerable neighborhoods in their urban and geographical environment, forming a larger scale ecosystem mesh that links the different areas beyond specific socioeconomic circumstances, rethinking the city as an artificial ecology, a deeper ecology that questions the broader issues of natural and urban environments while encompassing structure, function, and change [83]. The environmental network would thus qualify, once again, the tissues deficient in green space, identifying opportunities within its own features, typologies of spaces that assume the environmental role.

One of the main challenges is to eliminate the urban edge condition, which deepens the stigmatization of these neighborhoods. We proposed the adaptation of the hillside of the Castle as a public space, forming part of the network of green spaces in the city. Other important actions of the environmental network are the following: (1) to provide urban centrality to the ring road—providing access to the Barrios Altos at its upper level—transforming the road into a ‘long square’ with more public seating areas and citizen representation; and (2) creation of a ‘collective spaces’ system that could constitute a kind of disseminated environmental classroom, using the unused lots and spaces in the plot as new green spaces.

4.3. Urban Network

The current physical conditions manifest habitat degradation problems (Table 2), both in the area’s central public space (Plaza Santiago), and in buildings in neighborhoods with heritage value (La Magdalena and Judería). There is also a deficit of basic equipment inside the area and in nearby positions, the result of the difficulties experienced in the neighborhood in inserting them and the obsolescence of an historic urban fabric. Physical degradation is closely related to symbolic stigmatization and increased social vulnerability, so it is essential to improve conditions and reinforce the identification of spaces for social interaction to enhance the social capital of these neighborhoods.

Therefore, we pursue a readjustment of hierarchies in the urban space that allows the construction of an order of urban centralities, multiplying the functional possibilities of the city corners. The idea is to make the city a true articulated and interdependent space that facilitates the interaction of people and activities. In degraded areas, requalification strategies are necessary, but it is most important to re-signify the urban form to make it legible: identify a central structure that recognizes the axes and nodes of collective function and readjusts existing areas, what Gouverneur [84] calls ‘informal supports’.

In the case study, the buildings dedicated to collective activity and the city-scale facilities are identified; the main axes of commercial activity are also located, obtaining the distribution of collective functions (Figure 11).

The complementarity of the mobility system is studied by locating urban bus stops and car parks. To form the network structure, ‘street sequences’ are formulated that connect these activities and the modal transport interchange points, completing the network with new spaces for collective activity that reinforce the existing centralities; new sources are generated that extend the reach of the network and increase the connectivity of the interior of the neighborhoods with the rest of Jaén.



Figure 10. Proposed environmental network for integration of vulnerable neighborhoods and improvement of ecological connectivity. Source: authors.

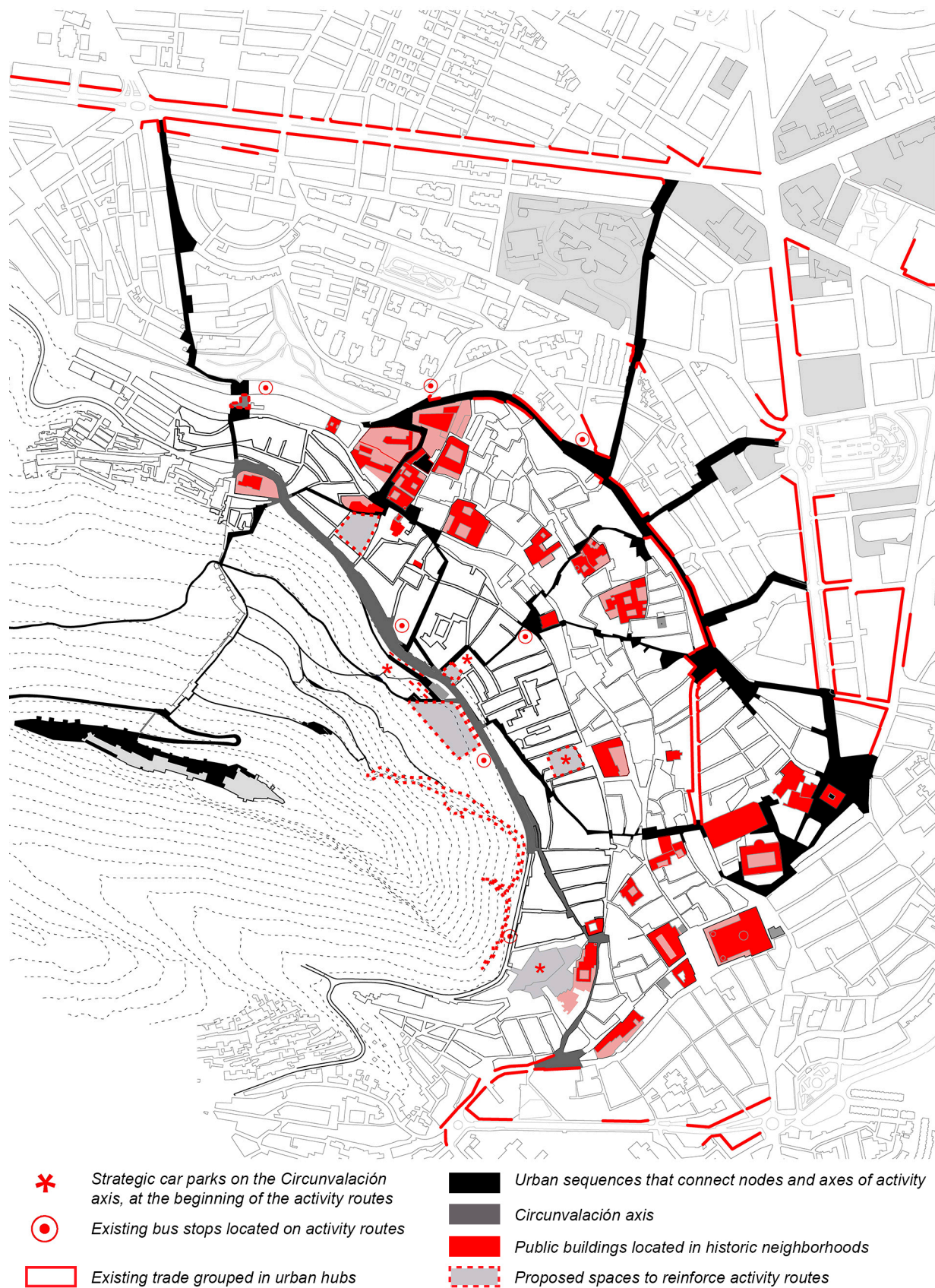


Figure 11. Proposed urban network for the area of the Barrios Altos of Jaén's historic center. Source: authors.

5. Discussion

In the studies carried out, both systemic and particular conclusions are deduced that, when identified in broken down solutions, detect common objectives and lines of argument that reveal overlapping facets of the public space network. These are attributes derived from the relationships between activity and urban form, the geography and culture of the place, capacities to produce new meanings and uses over a period of time, and the dynamism of places to adapt and transform [85].

Some consequences of applying superimposed relationships at different scales and themes are as follows: (1) the construction of a continuous public space, which links a diverse range of spaces; (2) attention to the contour of the space, and also by extension of its urban environment (more strategic urbanism and less based on design); and (3) the integration of different urban systems and functions in the urban space project (commercial and residential uses, collective functions, etc.).

As designed from a methodological point of view, the gradation of the various vulnerabilities according to subareas of the neighborhoods studied has served to interpret and calibrate the urban facts and spatial resources of these fabrics. Furthermore, these findings on vulnerability allow us to detect its continuity, durability, and transversality, which underscores the need to offer three operational networks for its reversal. According to the sources employed, the various methodological approaches ensure the quality of the results because the data sources are diverse and multiscale. However, additional in-depth sociological research in the field could help to improve the dependability and clarity of the disparities between sectors. For future research, it is important to stay up to date with the Urban Vulnerability Observatory, the primary source of data in this context. The Observatory updates the data it produces and confirms or denies the trends shown in the registries used in this study.

Once the problems have been identified and the cartographic methodology that reveals the opportunities of the network project has been developed, an interpretation is made based on the policies and measures necessary to articulate the regeneration dynamics of the vulnerable areas studied, all with the aim of improving the physical and social capacities of the neighborhoods (Table 3).

The proposed measures are based on the results previously obtained for each of the networks, considering that they have been obtained by establishing a contrasting relationship between the different dimensions that operate in the vulnerable neighborhoods. It is precisely the integration of these dimensions that makes it possible to establish action objectives that were specified in the set of measures described above. This is possible because the network-by-network results are not only thematic or based on content or programs but have been spatialized and placed in the specific context of observation of the upper neighborhoods of Jaén. Thus, squares, streets, plots, deteriorated areas, or buildings in disuse have been understood as spatial resources, opportunities, and values of the urban fabric that motivate and support the measures and that arise from the interpretation of the area in the process of construction of the three networks.

The proposed planning mechanisms, appropriate to the socioeconomic structure of the area, would implement the network strategy. For this, each measure is defined according to its objectives and according to 'where to intervene', 'how to intervene', and 'when' in order of priority (low, medium, or high).

In the case of the social network, the overall vulnerability of the entire region, identified in detail by distinguishing degrees according to census parts, necessitates the establishment of a social network aimed at improving urban environmental conditions. The results reveal that increasing the social fabric's self-esteem is necessary, as is increasing public investment and creating or consolidating areas of consultation and collaboration between political and social agents. This is why the measures focus on the recovery and community use of abandoned places, such as land plots. Similarly, it encourages the priority of residential and endowment activities in important or central areas of the urban fabric, banking on the expansion of pedestrian, green, and social spaces.

Table 3. Action measures for the three networks (social, environmental, and urban) and priority and degree of interaction between the networks of each measure.

Measures	Description (Actions/Policies) Where/How/How Much	Priority			I.	
		S.	A.	U.		
Social network						
Empty lot upgrades	Treatment of party walls, cleaning, conformation of alignment on the ground floor and access					*
	Public-private co-financing					
Network of temporary collective spaces	Treatment of the site, reduced rents from the administration					**
	Uses: workshops, educational, associations and participation, nurseries and environmental classroom, playground					
Priority construction and/or rehabilitation	Public investment according to position and relative urban situation of larger buildings/plots					**
	Singular residential use and/or equipment					
	Public-private co-financing for reactivation and promotion of functions in smaller buildings/plots					*
	Single-family or multi-family residential and small business					
Urban network						
Identify streets	Internal narrative itineraries and relationship with the rest of the historic center, access to the peri-urban Park					**
	Prioritize public transport—Reduce the presence of cars and parking—Adapt their living areas and viewpoints					
Project neighborhood ‘hearts’	Areas of Interior Reform/Singular Urban Projects that reuse obsolete spaces, new centralities, and re-equipment of collective spaces					**
	Plaza de Santiago—C/Concepción Vieja and Paseo de Circunvalación. Raudal of the Magdalena					
Urban transformation of the Paseo de Circunvalación	General Road System, linked to Developable Land of the General Urban Plan					***
	Increase in the pedestrian character/Calling for traffic—Increase in sidewalks and decrease in parking/Incorporation of a bike lane/Facilities and commercial activity on the edge					
Transformation of the slope under the Castle and improvement of access	Enable access to places to park and the Castle, surface parking, checkpoint, security and information point					**
	Redevelopment of the access section with a pedestrian character—Network of living spaces + pedestrian paths—Recovery of unique areas					
Environmental network						
Environmental transformation of the Paseo de Circunvalación	Design of the road section and study of sections, creation of plazas and citizen representation					***
	Plaza in the far north (La Magdalena)—Central ‘long’ plaza (San Juan and San Pedro)					
Consolidation of the Urban Forest Park	Enhancement of the hillside: a healthy, environmentally active, and socially used place					**
	Horizontal surfaces—Internal interpretive routes—Diversification of spaces (types of flora, light/shade, open/closed)					
	Very high priority		High priority		Medium priority	

S.: social; A.: environmental; U.: urban; I.: degree of interaction between networks: *** Very high; ** High; * Half.

In terms of the urban network, the findings revealed a lack of urban equipment as well as difficulty reading the fabric to identify the most important locations for social interactions. The construction of an amplified, strengthened, and extended urban network would imply the enhancement of the Santa Catalina Castle hillside, as well as the transformation of the Circunvalación, removing its character as a back or boundary road and prioritizing pedestrian and collective relationships in the space. The actions mentioned in Table 3 result in a resignification of the urban fabric, emphasizing the relevance of certain routes. In this approach, some urban positions are prized in comparison to others, and a more recognized urban center is constructed through many modifications to crucial corners of the community, as well as proposing a renewed social and urban heart of the area in multifunctional terms.

Finally, when we look at the environmental network, the results suggest a lack of green places and difficulties in reaching those that do exist. Disused or unoccupied places,

on the other hand, provide the opportunity to shape a more complex, interconnected, and diversified ecological and urban structure. Regarding the stigmatization produced by the border scenario, which is exacerbated by the character of the Circunvalación axe, its metamorphosis, pedestrian adaption, and reinforcement of its communal ability are critical. In this regard, the measures aim to facilitate internal communication within the neighborhood and with the Cerro de Santa Catalina, as well as to increase the quantity, strategic relevance, and accessibility of the city's system of open and green spaces, including the forest on the hill, as a valuable resource in this area.

6. Conclusions

Urban Links for a More Dynamic and Cohesive Future

The methodology used is what Dematteis would call a 'new and changing geography of urban territorialities' [86] (p. 54), formed by a triple network of social, environmental and urban factors, capable of understanding the current situation and plan in the sustained socioeconomic crisis, which is a fact in the Andalusian context and specifically in inland cities such as Jaén, if we take into account the trend in socioeconomic indicators in recent years [87]. Its configuration allows the improvement of the space, the environment, and the social landscape through citizen participation and interaction, with the collaboration of both public and private economic sectors.

The close link between the configuration of collective spaces and the social behavior of its users leads to a reticular vision of the structure of common places—everyone's space—as a materialization of the socioeconomic networks themselves. It is committed to a project that is connected and multiscale in conception [11], with the aim of improving functionality, diversity, and intensity with respect to the traditional perception of historical areas. As well as networks, social relations, collaboration, and social cohesion are important for urban regeneration because the social relationship is related to the actors and partners involved in projects and initiatives [26]. However, the formulation and configuration of networks and the consideration of their multidimensionality are essential starting points.

The proposed approach for these resilient strategies to improve social cohesion and urban integration is very porous, as it attempts to align with the established multifaceted character of urban vulnerability. This makes research applicable to a variety of contexts and circumstances. In this way, the analyses and diagnoses of socioeconomic conditions and those of the urban fabric are overcome, resulting in operational mechanisms that take advantage of the spatial opportunities of the urban regions under consideration. The major issue is the system's potential for public spaces and road support in terms of its ability to address existing agreed-upon challenges such as proximity, combating the local consequences of climate change, social inclusion, reinforcing local identities, etc.

To configure the social space network, central nodes or corners are established equally in the territory, strengthening the existing ones, or creating new ones that generate renewed links to reinterpret the urban structure [71]. These 'nodes' of the urban system must be articulated within the main structure, reflecting on and defining measures that ensure accessibility, diversity, and flexibility while strengthening proximity networks that contribute to improving urban and social cohesion [39]. As Maloutas and Pantelidou also pointed out, the idea today would still be 'how to exploit the potential for change towards a more egalitarian future, within the limits of the existing socio-political system, involving civil society as much as possible in the process' [40] (p. 451).

On the other hand, the usefulness of gathering large amounts of information on the state, form, and pre-existing processes is highlighted, systematizing it in the exposed networks, as a source of knowledge to find a repertoire of simple solutions, broken down into minor necessary actions, combined, but at the same time independent of each other. The production of an urbanism that delves into multi-scale and multi-temporal relationships, manages to set a series of priorities, and locate 'key demands' for the present moment and space.

As Montgomery establishes, what is important would be to develop not only an understanding of cultural neighborhoods, but also resilience strategies, and put them into practice as a paradigm of urban regeneration [85]. The prospective cartographic plans of future thematic networks are supposed to be used as an argumentative instrument as well as a methodological one, for example, the park itineraries, integrated environmental classrooms, collective fabrics network, among others. On one hand, the multidimensional networks will help to integrate social, economic, architectural, and/or patrimonial features. On the other hand, going beyond the production of specific urban designs, they will foster the consolidation of open systems that lead to the establishment of new positive relationships to reinforce social cohesion.

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