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City and territory
in the Globalization Age

1. Stages in territorial configuration

Making a sustainable network-community for refugees from the Fukushima nuclear plant disaster in a stable historic castle town and region

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Abstract. *After the Fukushima nuclear power plant accident disaster, all of the residents in the area contaminated by radioactivity and all public facilities were evacuated to surrounding regions or more remote cities on the direction of the central government. As a result, temporary housing estates for the refugees are scattered, and aged refugees still remain on these estates six years after the disaster. The town of Namie had the largest number of people who were ordered to evacuate in the evacuated area. The city of Nihonmatsu, adjacent to the contaminated area, is a typical Japanese castle town, and accepted many Namie refugees, offering temporary housing, and housing the town office, schools, hospitals, industrial sites, etc. The Fukushima Namie Recovery Project team, organized by the NPO Shinmachi-Namie and Waseda University, proposed a Network-community connecting several refugee housing estates, evacuated public facilities and other core city services. These need to be connected and their community reintegrated, in practice facilitating the “support system for the network community”. This vision of a Network-community would be adapted to the historically stable region, which includes various dispersed, aged and isolated communities. Nihonmatsu, as the Castle Town of the Nakadori region of Fukushima Prefecture, is noteworthy for its historical urban areas, old streets, lots of unoccupied housing etc. That is, it is very hard to get the people of Nihonmatsu to think optimistically about shelter for Namie evacuees. Nevertheless, areas of the Nakadori region including Nihonmatsu may cooperate with the Namie evacuees and reinvigorate the ruined coastline by means of the “Network Community” – a network encompassing various historical traditions that still exist today as regional assets; thus, the vision for the future of Fukushima is one of hope.*

Keywords: Network community, Castle town region, Refugees from Fukushima nuclear power plant accident disaster

Introduction

Due to the disastrous incident that occurred in the Fukushima Daiichi Nuclear Power Plant (operated by TEPCO), the entire population of the town of Namie were compelled to leave their livelihoods and evacuate to other parts of Japan. Since this disaster, both the Waseda Institute of Urban and Regional Studies and the Satoh Laboratory of Waseda University

have devoted themselves to the rehabilitation of the devastated areas. Both groups received a request from the Machizukuri Corporation NPO Shin-machi Namie (abbreviated below to: Shin-machi Namie), and since the autumn of 2011, the Waseda Group have endeavoured to support the Fukushima victims through activities aimed at community rehabilitation. The fundamental stance of our research then is close cooperation with the city plan of the Namie-machi administration, and the

promotion of the Rehabilitation Machizukuri project. To this end, a mutual agreement for three-way research cooperation was reached between the Namie Town government, the Non-Profit Organization “Shin-machi Namie” and Waseda University, so that the Machizukuri project may proceed smoothly. At the beginning of 2012, the Waseda research group proposed a basic schema for a circulatory process for the restoration of the Namie community over a period of thirty or forty years. (Fig. 1) March 2017 marked six years since the disaster, and in April of this year the evacuation order was cancelled in the central section of Namie town, although the entire population of the town has evacuated, sought refuge elsewhere, and settled down in new communities built around the outskirts of Namie or in a number of host cities. (Table 1)

For the time being, before they are able to return to Namie-town, the spiritual and material safety and stability of the private lives of the refugees must be ensured. The task remains of upgrading infrastructure and planning new public housing in the host cities of Fukushima Prefecture, and the evacuees must carry on rebuilding their lives and moving forward to a fresh start; yet, these scattered evacuee communities should not be isolated. Close to each community should be constructed public facilities, familiar grocery stores or cafés for social interaction so that the scattered communities can interact and are not cut off from each other. Every “Namie outer community in a host city” built with familiar public facilities close by may not only interact with other communities but also inherit the culture and heritage of Namie. In order to beef up these “neighbouring communities,” they need to be linked by means of an information system and a means of transit; and therefore the concept of the “Network Community (Fig.

2)” was put forward.

Taking the concept of the “Network Community” as its basis, this paper describes the “emerging multi-layered urban region in the host city region which accepted refugees from the contaminated coastal area, forming a network-community for refugees, centred on a historically stable castle town and its surroundings”.

The network-community includes the “outer communities” formed by refugees and the “inner communities” in Namie town as base via which refugees may return to their home town, and these outer and inner communities are linked by a network of transit and information systems.

Research Question regarding the New Network-community and the Historic Region

The research question of this paper is how to build a network-community connecting the “Namie outer communities in host cities”, and how to revitalize the city region by means of a network-community formed in the historically stable and declining castle town region.

One of the host cities accepting evacuees from the disaster area, the City of Nihonmatsu is a typical Japanese castle town. Nihonmatsu Castle is located on hilly land in the centre of a basin, and the castle town developed along the Oshu Highway axis that runs east to west. The town was constructed by Niwa Mitsushige, beginning in 1643. The Kasumigajo castle was constructed on a hill to the northwest of the town, and the samurai area was laid out below the castle. The castle town in its entirety was built with a sophisticated landscape design early in the 17th century, surrounded by and in harmony with nature, composed of mountains

Number of refugees	From <u>Namie</u> Town (as of 31th/Dec. /2016)	From Fukushima Pref. overall (as of 20 th /Feb./2017)
Total	20,833	(79,446)
within Fukushima Pref.	14,470	(39,608)
outside of Fukushima Pref.	6,363	(39,818)

Table1

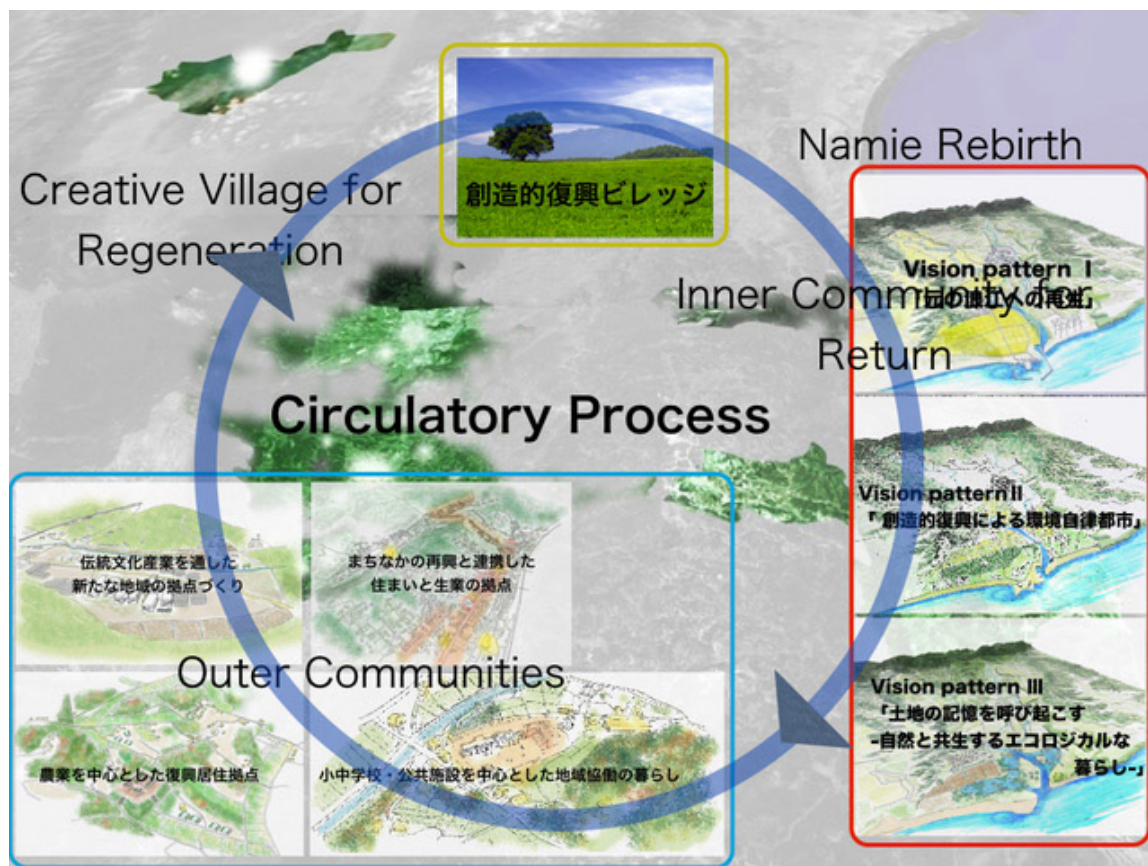


Figure 1. (Hypothetical Vision for Rebuilding the Namie Community)

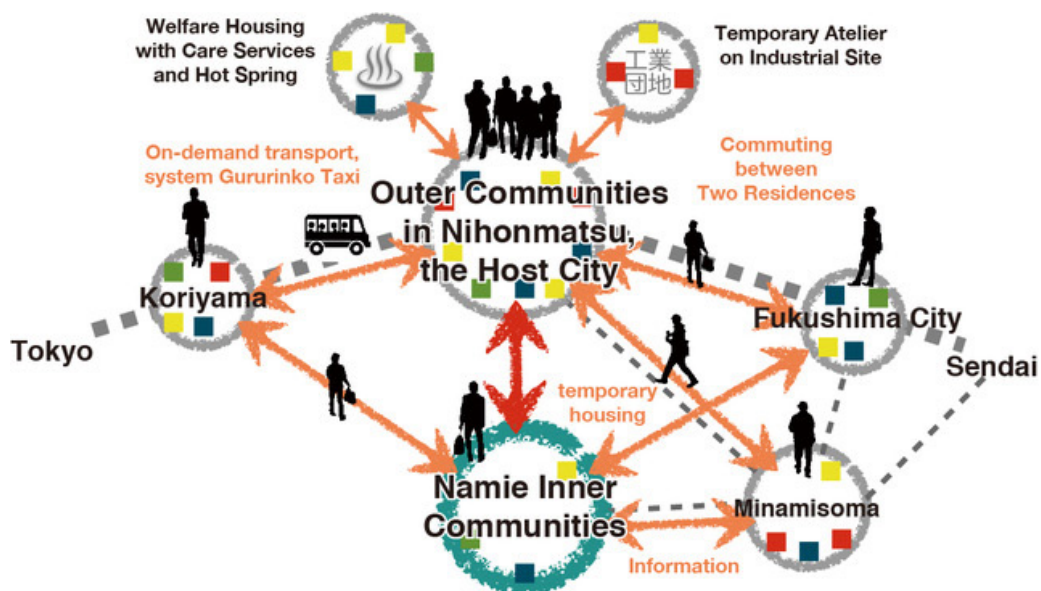


Figure 2. (Image of Network-Community for Rebirth)

clothed in forests and an abundant water supply, symbolizing a sacred place. Using the natural environment as its foundation, urban planning is done organically, incorporating Nature. Various important places and views are connected and linked in the historic city and its surrounding areas. (Fig. 3)

In the Modern Age, since the late 19th century, the Nihonmatsu city region grew as a regional centre. Modern infrastructure was built over the historic urban form starting in the late 19th century, and urban sprawl was evident.

Since the 1980s, Nihonmatsu city centre and its surrounding areas have been declining, losing population and commercial activity – a common phenomenon in provincial urban areas throughout Japan.

After the disaster on the 11th March 2011, the schools and public facilities of Namie Town were removed from the original town area and scattered throughout the Nihonmatsu city region together with some temporary housing estates. “Outer communities,” which were formed from temporary housing and other public facilities just after the disaster, need to be transformed in various ways into stable communities for the future lives of the refugees, through the construction of public and other housing, community and health care facilities. The laying over this region of a network-community of the refugees’ outer communities will cause a new active energy and diversified culture to emerge. The laying of a network community over the stable and rather declining region could energise and regenerate the region. In order to avoid the isolation of each outer community, the communities should be linked by an on-demand transit system managed by a non-profit organization, and linked by an online social network system.

A collaborative planning process implemented between Nihonmatsu City and Namie Town, both at the citizen level and at the local government level, would have the effect of revitalising the region through the overlaying of the network-community. On this basis, if the Namie evacuees and the citizenry of Nihonmatsu could work together, a new model of community recovery is possible.

Those developed, or mature, regions may appear to be stable, but behind their outward appearance those regions themselves can be dull and inactive. In addition, the evacuee communities have had no alternative but to evacuate from their deep cultural roots to other regions, so conflict between the host communities and the evacuee communities does occur.

Taking as its basis the concept of the “Network Community,” this paper presents four stages describing the particulars and details of the actions and methods employed, which are still being developed by our research team members. The aim is to make the town people aware of the meaning of “action research” by bringing up the process in thorough discussion of the process of action, and by expanding cooperation between the numerous subjective groups; and in this way we may expect the townspeople to see their regions energized and their communities revived.

This research began in Stage One by matching the project developed by the Japan Scientific and Technology Agency (JST) and designed to suit multiple dwellings for evacuees who favour the scattered type of community; this paper concerns itself here with how the Network Community is shaped.

Sharing of the Rehabilitation Scenario Stage 0: September 2011 ~ September 2012

Having been asked to help the project of “Shin-machi Namie,” the Waseda Institute of Urban and Regional Studies and the Satoh Laboratory of Waseda University began to work on this in September 2011, setting up collaboration and team participation as the premise for the study and promotion of the assumed vision for the long-term rehabilitation of Namie. Here we set out the process for Stage Zero, in which the scenario of a network community and the vision of rehabilitation for tomorrow was prepared and shared with the people of the town.

The nuclear power plant accident was both a turning point and yet an opportunity as well. Many of the town folk wish to return to Namie and others don’t; yet the townspeople as a

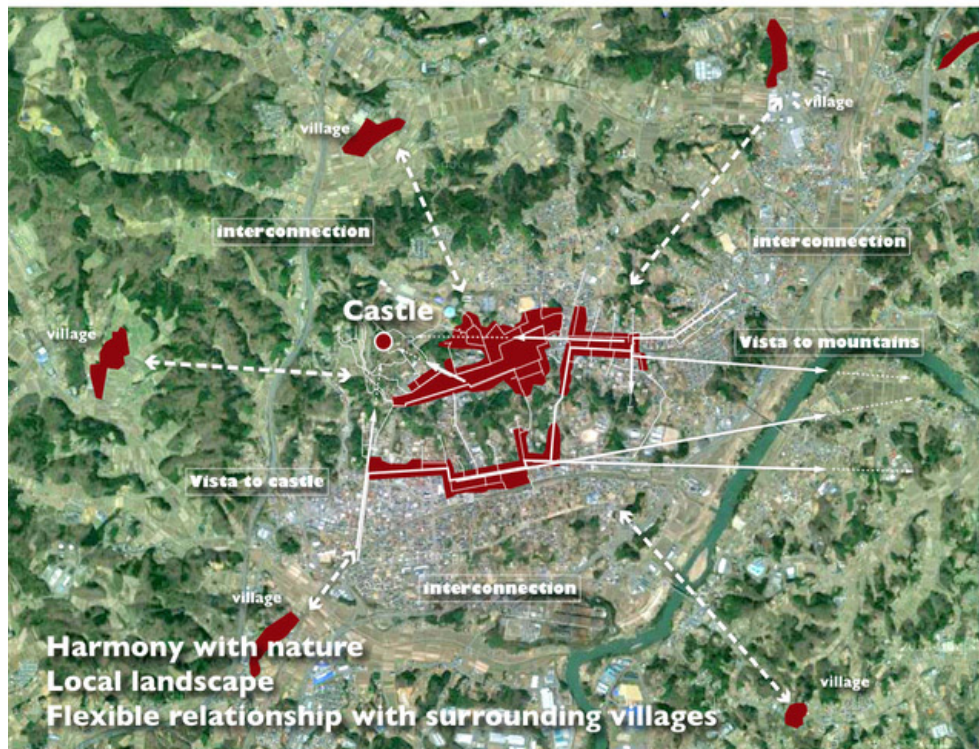


Figure 3. (Nihonmatsu Castletown as a networked community in the Edo Period between the 17th and 20th centuries)

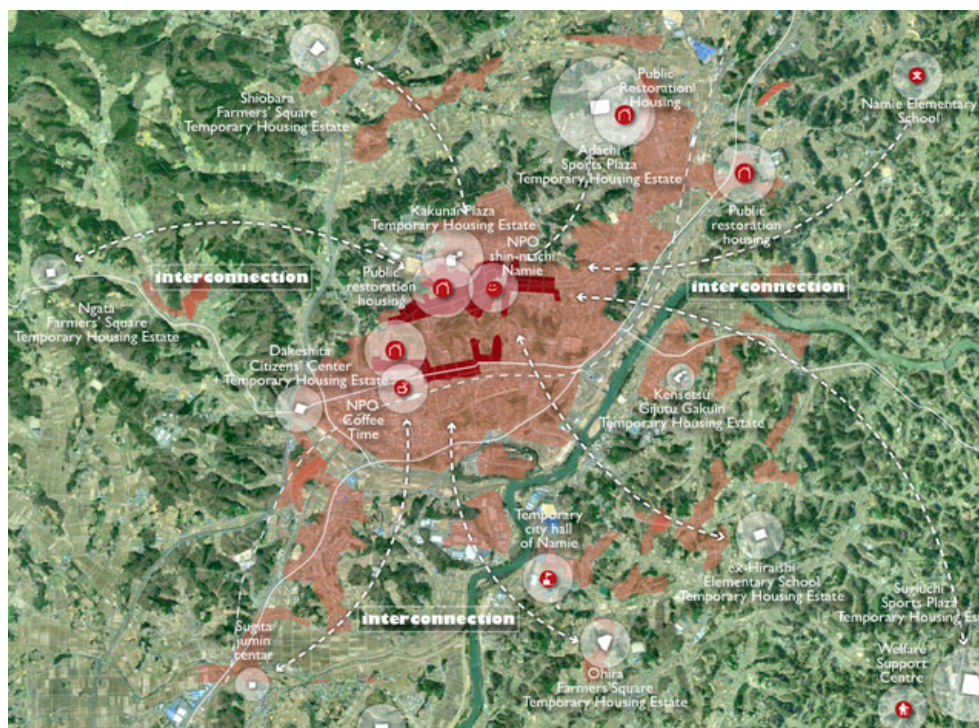


Figure 4. (Interconnection between outer communities, various layers and elements of the network system)

whole need a vision to keep them together and maintain a unified community.

Below are described three types of community cooperation designed with the concept of linkage (see Chart 2), to pave the way for reconstruction.

(1) The Namie Inner Communities (the communities to be rebuilt within Namie)

The process for the return to Namie-machi still remains uncertain; the R&D group assumed three scenarios relating to the future of Namie. In the first scenario, the majority of the people of Namie, around 60%-80%, would return and be eager to see the regeneration of their town as it was before, and the revival of their communities. In the second scenario, many young people would feel hesitant about going home, but roughly half – about 40%-60% – of them would like to make Namie “an autonomous city regenerated by creative reconstruction.” And in the third scenario it is assumed that only 20%-40% would return; they would recall the memory of Namie and live ecologically in harmony with nature.

(2) Little Namie (Namie outer communities)

The communities built in host cities as rehabilitation housing complexes must be able to meet the diverse needs of the evacuees. A network system, in particular, is needed to keep the scattered communities in touch with each other. Collaboration may also help revitalise the host cities.

(3) Villages of Creative Rehabilitation

Leaving Fukushima to search for new communities nearby or elsewhere in the Japanese islands, these evacuees would surely be eager for a community where they can have a stable life together. Making the most of the untapped resources of the land, they can lead a gentle life, raising their children, farming, raising livestock and enjoying social welfare, free from the radioactive contamination.

The mechanism to support the Network Community system ~ Creating a rough consensus Stage 1: October 2012 ~ March 2013

Since October 2012, the activities of Stage Zero have been developed and implemented as

a JST R&D project. The Satoh Laboratory of Urban Planning, Waseda (the Satoh Group), the Asano Mitsuyuki Laboratory of Transportation Planning (the Asano Group), and the Andō Kiyoshi Laboratory of Social Psychology, Tōyō University (the Andō Group) took this opportunity to establish a new JST research group.

Here, we describe the process of Stage One in which a specific spatial image of the Network Community, the mechanism to support it and the scheme to put it into practice were studied.

Community Spatial Image and Public Transport System

Motivated by the idea of the Network Community developed and shared in Stage Zero, the Waseda team worked out three types of community design with specific spatial planning; two of these are Namie outer communities formed in host cities, and the third type was designed within Namie itself.

Type (1) is the “Outer Community within in the Host City,” planned in cooperation with the host city to build public housing and establish bases for commercial and welfare services.

Type (2) is the “Outer Community outside the Host City,” established close to the temporary housing on the outskirts of the host city, with the aim of sustaining the Namie evacuee communities that developed in the temporary housing.

Type (3) is the “Namie Inner Communities,” meaning the communities to be rebuilt within Namie in the future as bases to which the evacuees could return, planned with an eye to promoting the full-scale return to Namie in the long term.

When thinking about the public transport system, the Asano Group considered the possibility of their New Gururinko transportation system being accepted, based on the image of the on-demand Namie Gururinko taxi system, which had been widely used by the townsfolk prior to the Great Earthquake and Tsunami Disaster of 2011. From this starting point, the Asano Group designed three transportation systems; the Nakayoshi town-taxi for daily activities like shopping or hospital visits, the Mirai town-taxi for temporary returns to Namie, and the Enjoy town-taxi for

travel to recreational facilities like theatres, hot springs and hotels, and transit between homes and various public locations.

Based on the October Organisers' Meeting and the workshops held in November 2012, the models made for Machizukuri and related systems were amended and modified; and on 23-24 November the traditional Toka-ichi Festival (the most significant traditional annual event in Namie, held ever since the Meiji Era) was held in Nihonmatsu and opened to the people of Nihonmatsu for participation and creative suggestions.

Namie Declaration 1303: the Process for full-scale project implementation

Following the planning of the three types of communities, the research groups gave serious consideration to the project schemes to implement the designed projects, seeking to enliven the evacuee communities.

The Satoh Group and the Asano Group, working in cooperation with the researchers and consultants from the Waseda Institute of Urban and Regional Studies, proposed several business models and the staff capable of providing the necessary cooperation. After two Organisers' meetings, most organizers had an understanding of what projects they were able to participate in, and their individual role.

Take the town of Kori-machi to begin with; this town, located in the northern part of Fukushima Prefecture, provided land on which to build a temporary housing complex for evacuees, almost all of whom are from Namie. The land is right next to the town, and plans went ahead to build a municipal rehabilitation public housing complex and private housing for sale. Thus, the above-mentioned "Outer community outside the host city" is working towards the rehabilitation of Namie; meanwhile, the Chairman of the local government, an organiser of the Fukko-juku project, began a survey of the people living in temporary housing regarding their intentions to live in this outer community outside the host city.

The NPO Corporation Jin (Jin) had been involved in the social welfare of Namie before the earthquake disaster of 2011, and since the disaster, Jin has run Support Centres in

the contemporary housing complexes, and has considered the possibility of running the New Gururinko transportation system out of its Support Centre in Sugiuchi District, Nihonmatsu.

The Namie Association of Commerce and Industry has begun working on commercial activities in cooperation with the commercial areas of Nihonmatsu City to where many Namie people evacuated, and some members have started to emerge who have firmly resolved to boost local commerce and industry by creating a commercial base for the "outer community within the host city".

Through this process, the six Projects aimed at bringing about the great vision of dreams and hope shared in Stage Zero were put into practice and the Namie Declaration 1303 was officially issued on March 2013, and received the approval of many at the Namie Rehabilitation Symposium, held in the same month.

Building a foundation for the implementation of Rehabilitation Machizukuri in the refuge areas Stage 2: April 2013 ~ March 2014

In Stage One, the structure to support the image of the Network Community was shared with the local government of the host city, and with the forming of a system of mutual collaboration the foundation was in place to build the Namie Outer Communities in Host Cities in preparation for the transfer of these Outer Communities back to Namie.

The aim here is to advocate "Machizukuri for Cooperative Rehabilitation," and in order to put this into practice, the rules and structure of a cooperative network must be prepared as the foundation on which this Machizukuri for Cooperative Rehabilitation can be built. This is the process of Stage Two.

A study: the Business Scheme to start the Cooperative Rehabilitation

The first step to Nihonmatsu-Namie Cooperative Rehabilitation was taken in the central area of Nihonmatsu City where the temporary housing constructions and many Namie evacuees are concentrated. A series of

meetings and discussions was held focused on the issue of how to energise the town of Nihonmatsu whilst building the Namie Outer Community in the Host City through the sharing by the people of Nihonmatsu and the Namie evacuees of the town's vacant land, unoccupied housing, and the commercial areas and historical resources of the castle town. The Satoh Group added to these discussions, from its surveys of vacant land and unoccupied housing, several proposals and amendments to the Namie Declaration 1303. All this, then, was examined carefully by the businessmen, tradesmen and professionals in various fields from both Namie and Nihonmatsu, and discussions began regarding a scheme to put these amendments into practice. Organisational issues regarding land acquisition and the procurement of funding to put the scheme into effect were shared, and it became clear that for the process of Cooperative Rehabilitation to go ahead it would be necessary to request the national government, the prefectural government and Namie to facilitate systematic land use.

Preparation of a structure to request a system to promote Cooperative Rehabilitation

Thus, in order to act in accordance with the consensus of the evacuees with regard to this request, the Satoh Group proposed the establishment of the Machizukuri Committee headed by the Chairman of the temporary housing residents' association, and in September 2013 a meeting of the representatives of the temporary housing residents' association was held.

Moreover, since the Machizukuri for Namie Cooperative Rehabilitation must be seen as a model for recovery for all communities struck by the nuclear power plant disaster, with the cooperation of the Fukushima Cooperative Rehabilitation (Co-Rehabi), which has built a network of victims from every part of the nuclear disaster area and their supporters, a Machizukuri forum was held. At this forum, the "Vision for the Cooperative Rehabilitation of Fukushima" was adopted by the disaster-hit communities and host communities of Fukushima as a body, and thus Cooperative Rehabilitation was started. (see Fig. 6)

Later, the Namie Machizukuri Council for Rehabilitation (the Council) was founded, following the holding of two preparatory meetings at which official requests were made and processed forward. This led to the Namie Declaration 1405, and in May 2014 the Council was officially established. In addition, a petition endorsed with over 1,100 signatures was handed in to the Mayor of Namie Town.

Beginning the experiment in earnest Stage 3: April 2014 ~

Finally, we come to Stage Three, in which practical experiments based on the activities carried out so far would be carried out in earnest.

To begin with, the Council shares information using the Namie Information Network and holds a regular monthly meeting. In addition, a network system is planned whereby a tablet terminal will be distributed to each of the more than 10,000 Namie households before the end of the 2014 fiscal year, and in cooperation with Code for Japan an app is being developed to maintain the bond between the townspeople. It is expected that this system will be used and updated, boosting the easy and timely sharing of information via SNS.

Based on the results of the New Gururinko taxi experiment in Stage Two, Jin, an NPO Corporation involved in this kind of social welfare experiment, has started full-scale practical tests – the Nakayoshi-taxi service in the Sugiuchi temporary housing area, and the Enjoy taxi service in the Adachi temporary housing area, etc. In addition, the monitoring system Ogenki Call System, developed by Professor A. Ogawa of Iwate City Univ., and using the telephones being installed in each area will surely serve a vital role in supporting the daily lives of the people of Namie. (Fig.2) Further, in Ishikura District, land adjacent to the Adachi temporary housing complex has been reserved for the construction of prefectural disaster recovery public housing. The attached facilities will include the clinics and assembly halls evacuated from Namie and already established in the Adachi temporary housing complex. This plan is by and large

similar to the “Outer community outside the host city” of Stage One. In the case of Ishikura, the Waseda team has studied the possibility of town development incorporating the outskirts working on the premise that two hundred units of middle-class public housing will be built compliant with Fukushima standards. Working with the residents of the Adachi temporary housing complex, the Satoh Group has studied this perspective through a series of workshop meetings with the residents of the Adachi

complex, using models. (Fig.5)

In this way, Stage Three is still on-going and the full-scale practical experiments are being carried out on the basis of the shared vision and the system established in Stage Two. This scheme could be expanded to all areas of Fukushima Prefecture where the many negative impacts of the nuclear plant accident damaged the local economy and society, in order to revitalise this area. (Fig. 6)

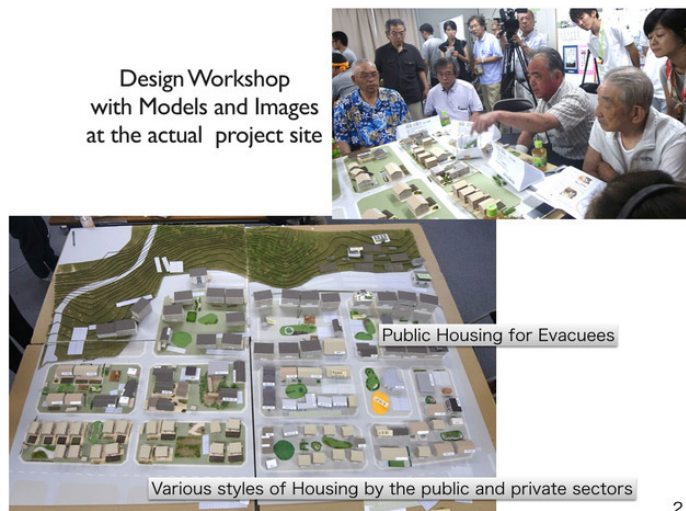
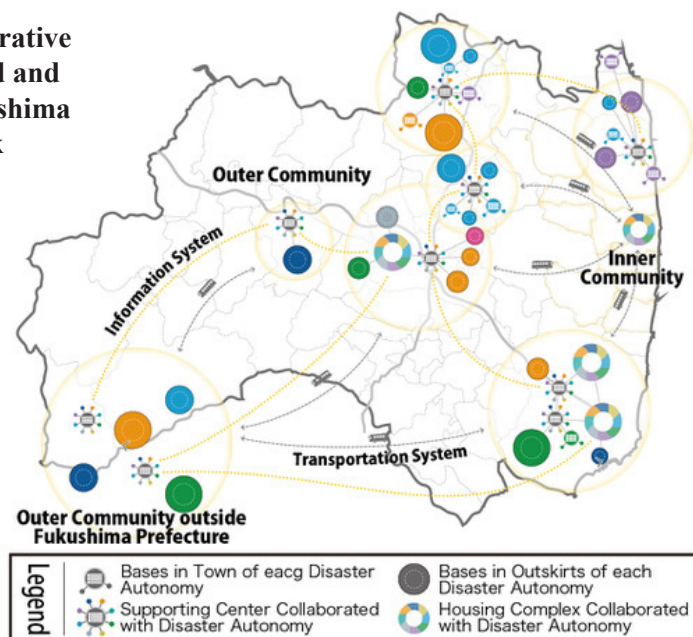


Figure 5. (Design workshop by refugees using models and images at an outer community project site)

Figure 6. (Vision for the Collaborative Reconstruction of Evacuated and Host Cities & Towns in Fukushima Prefecture as a Network Community)



Conclusion

The 21st century faces a complicated situation, both locally and globally. As we see in Europe today, some local communities are becoming unstable and swinging between the developed, mature Europe and those unstable, changing regions where communities are endlessly in conflict against each other.

My point here is that both the stable countries and the dynamically changing communities just might be brought together in cooperation rather than be separated in conflict. Each region has its own diversified context, and each is different. Both the stable society and the turbulent society must respect the other. A new spatial model to act as an appropriate social solution for sustaining stability in these regions needs to be found. Through practical investigation into situations like Fukushima, I believe we could find a new vision for local communities and design a model to make the vision a reality.

I hope that the vision of the Network Community can also be adapted to those historical regions where the communities are aging, isolated and relatively inactive.

We must have a new vision for regional communities, and we must prepare a model for that vision.

The signs of turbulence started in Japan; my country suffered the catastrophe of the destruction, by earthquake and tsunami, of a nuclear power plant. And, in the wider world today, the mature and stable Europe has started to experience tumult and unease from its encounter with chaotic Arabic countries, or with nations who are eager to achieve their own growth.

In other words, the world today cannot afford to have its countries split into two polarities.

A new social and spatial model is needed that will enable us to stand firm and safe between the two polarities of the regional model; we must try to make these two types of regions embrace each other in peace, both socially and spatially.

References

- Satoh, S. (2014) 'Reforming the Network Community for Refugees Dispersed by the Fukushima Nuclear Power Plant Accident', *City Planning* 331, Japan City Planning Institute
- Satoh, S. (1995) 'Joukamachi no kindai toshi zukuri [Castle-town Cities in Japan and Modern Urban Morphology]' (Tokyo, Kajima Institute Publishing).
- Satoh, S. (1997) 'The Morphological Transformation of Japanese Castle-town Cities', *Urban Morphology* 1(1), 11-18.
- Sugano, K., Okitsu, R. and Satoh, S. (2016) 'Medieval Castles and Pre-Modern Castle Towns Planned with Nature as the Heritage for Landscape Design Today: A Case Study of the Nanbu Region in Tohoku', *History, Urbanism, Resilience: Planning and Heritage. International Planning History Society Proceedings* 4, 274-284.

Measuring compactness of the urban landscape within a city territory for environmental capabilities: The case of 50 cities in Eastern China

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Abstract. *When a compact city is pursued as the strategy for urban sustainability the understanding of compactness is varied from the developed countries to the developing countries. In China the historical cities are characterized with high density and mixed land use. After a short time of motorization they still show compact forms in the central city. A large amount of newly developed areas are distributed in clusters near or far from the center. The crop land and natural habitat are encroached to different degrees. This paper developed an approach to measure the structural compactness of urban landscape patches within a city territory. It included six spatial metrics to measure the shape and density of the central agglomeration, the area configuration and distant relationship between the central agglomeration and the other clusters, and the distribution of all urban patches. By this approach the 50 cities in eastern China were categorized into five classes of forms: mono-center, multi-nucleus, centralized group, cluster group and scatter. Then the vegetation biomass loss with urban expansion was calculated based on remote sensing data, and used to assess the environmental capability of the five types of urban form. The suggestions of urban form optimization could be put forward for the five categories of cities.*

Keywords: Compactness, Chinese city, spatial metrics, vegetation biomass, urban planning

Introduction

Under the background of rapid urbanization worldwide, a compact city is promoted to mitigate the adverse consequences of urban area growth. It features a high density and mixed-use urban form, being claimed to conserve arable land and wildlife habitats, decrease travel by car and reduce fuel emission, improve access to services and facilities and provide more efficient public infrastructure. Despite the policy in land use policy and urban planning in many countries, the meaning of compactness lacks of consensus and few data

are sought to support the claimed advantages (Jenks, Burton & Williams, 1996). Thus different indicators are studied to measure the variety of attributes of compactness. For instance, Burton (2002) defined a set of indicators at dimensions of density, mixed-use and intensity and tested in 25 UK towns. These cities performed differently for different indicators, and the scores for individual rather than the composite indicators of compactness display greater contrasts between cities. This divergent result is clearly not conducive to a clear description of traits of compactness, upon which the causes and consequences

are to be studied. Considering uncertainty in and huge demand for the data of population density and mixed land use, morphological measures are much feasible to describe the actual physical form of built-up areas with the clarified definition, detailed and robust spatial data. A range of spatial metrics derived from the definition of sprawl condition, have been adopted to measure urban compactness as the other side of the coin (Galster et al., 2001; Tsai, 2005). They depicting land use patterns at dimensions of density, continuity, centrality, clustering etc., can be compared among cities in different countries (Angel et al., 2005; Huang et al., 2007; Hagen-Zanker & Timmermans, 2008). In addition the physical and spatial pattern of urban areas provides a basis upon which to achieve urban efficiency. For instance, through selecting particular urban form we can estimate how much energy can be saved. To build such a consistent planning paradigm there are still some lack of studies aimed at integrated innovative analytical approach and accurate assessment of urban performance under investigation (Silva, 2016). This paper will take the real case scenarios of Chinese cities to study the physical forms of built-up areas aiming at assessing urban performance. Chinese cities have two thousand years of history, many of the old city developed within the city wall until the 1950s. Since the 1980s, the process of urbanization accelerated in the form of increase in the number and scale. The new city was built on the basis of the original county town. Big cities, in addition to their own outward extension, but also built some secondary centers in their territories through the establishment of development zones, new towns, and etc., thus promoting the expansion of urban scale. During this period, the population growth and employment needs drove urban expansion on the hand of endogenous stimuli, and on the other hand the urban planning regulated to a large extent the scale and morphological changes of Chinese cities (Chen et al., 2009). China's urban planning policy which took the excessive expansion of the city in the West and other developing countries as a mirror, strictly restricted the development of large cities. In the perspective of saving land, a criterion of per square kilometer per 10,000

people has been severely implemented in the master urban plan, effectively maintaining the high population density in the central city. At the same time, the group development is promoted to meet the needs of urban growth. The group layout of compact urban clusters in a city territory has been reflected in the master plan. In this context, most of the city's central area and other concentration areas are dense, although it cannot be said that the full efficient use of land, the study of compact development shifts to focus on the compactness of city group structure (Fang & Qi, 2007; Ma & Jin, 2011). It involves not only the centralized layout of edge growth to a core but also the multi-center concentration, or multi-level center of the centralized layout. Thus the dimension of global spatial autocorrelation should be considered to reflect the compact thinking of the group.

Methodology

Considering the multi-dimensional and multi-index characteristics of urban compactness, a clustering analysis method was used in this study, by which the cities with significant discrepancy in compactness were quantitatively differentiated and classified. Based on the SPSS19.0 software, the Euclidean metric is chosen as the measure of similarity, and according to the values of compactness index the sample cities are classified by the Wards method of hierarchical clustering. On the one hand, the classification approach can partly keep information of the basic indicators and avoid the semantic ambiguity of the composite index. On the other hand, the synthetic type through classification can be used as the basis upon which urban performance be assessed, and effect index by types can be obtained and discussed in association with compactness. In this study the indicator of vegetation biomass loss under urban expansion is adopted for the performance assessment. A higher indicator value denotes the bigger ecological loss caused by urban expansion in the selected urban form type, meaning the effects of the compactness type is less preferred.

The spatial metrics are selected to reflect the

structural compactness. Because of the core-periphery structure of Chinese cities all the urban clusters in a city territory are separated into the central built-up area and the others. The dimensions of density, shape, distance and spatial autocorrelation have been considered for the individual or composite characteristics of the two types of urban clusters. The density and shape measures are only applied to the central built-up area which hold the major urban activities, as the first level of compactness metrics. The second level of compactness measures reflect the spatial structure of the central area and the other urban landscape patches, including their area composition and distance distribution. In addition, the global spatial autocorrelation index is used to analyze the spatial layout characteristics of all patches as the third level of compactness measure. Each level of specific indicators are chosen from the defined spatial metrics in literature (Richardson, 1973; Brueckner & Fansler, 1983; Cole, 1964; Tsai, 2005). After repeated comparison of index feasibility, applicability in Chinese cities and data availability, six indicators have been determined in this study, including the Richardson compactness, density gradient at the first level; continuity, Galster centrality at the second level; Gini coefficient and Moran's I coefficient at the third level. Their definition and calculation methods are shown in Table 1.

The study area is located in the central eastern coastal area of China, including all the designated cities in the Yangtze River Delta excepting for Zhoushan which is composed of islands. The total of 50 selected cities include two types: the city with district (or prefecture-level city) and the city without district (or county-level city). The territory of the first type city is the outline boundary of its urban districts, excluding the area under jurisdiction of the county, for the second type city the territory is the administrative scope (Fig. 1). In this study the built-up areas in a city territory involves the central one and its peripheral clusters, key towns, not including rural settlements. We obtain the patch vector data of the built areas from interpretation of the satellite images with the resolution of 30

meters in 2000 and 2010, which is used for calculation of the spatial metrics. Moreover the data of the urban land within the concentric circles for the density gradient calculation, as well as the built-up area on the grid for spatial autocorrelation analysis can be acquired by the superposition operation of the vector data.

Taking vegetation biomass as an example, this study attempts to assess the city performance with different compactness. Vegetation biomass presenting the total amount of organic matter (dry weight) in a unit area, at a given time, and distinguishing the types of green areas quantitatively, is mapped based on multi-sourced data, including remote sensing, meteorology, land use/cover, forest inventory, and grain yield (Li et al., 2016). With the data of built-up area change from 2000 to 2010, the biomass loss values per unit area of urban expansion is calculated for the assessment. The higher the value the lower the benefit of the compact city type in a view of vegetation conservation.

Measurement and analysis

Results for the six compactness metrics are reported for each of the 50 YRD cities. Similar to the previous literature, different indicators perform different among the cities by the bar graph (Fig. 2). When considering the size of the city the large cities are characterized with some lower density gradient and higher Moran's I, while variation of the indicator among small cities is little. In general the indicators and the size of the city is not particularly consistent with the law of change, revealing that the indicators of independence is strong. Five urban form types are obtained by cluster analysis. For each type, the difference between the internal mean value and the mean value of each index is expressed by standard deviation (Table 2). When the average of one or more indicators within a type is much higher than the mean of corresponding indicator, this type is regarded to be dominated by this or several indicators. According to the core-peripheral relations denoted by the indicators, combined with the experience observation of real case of urban areas, the five types are defined and modeled,

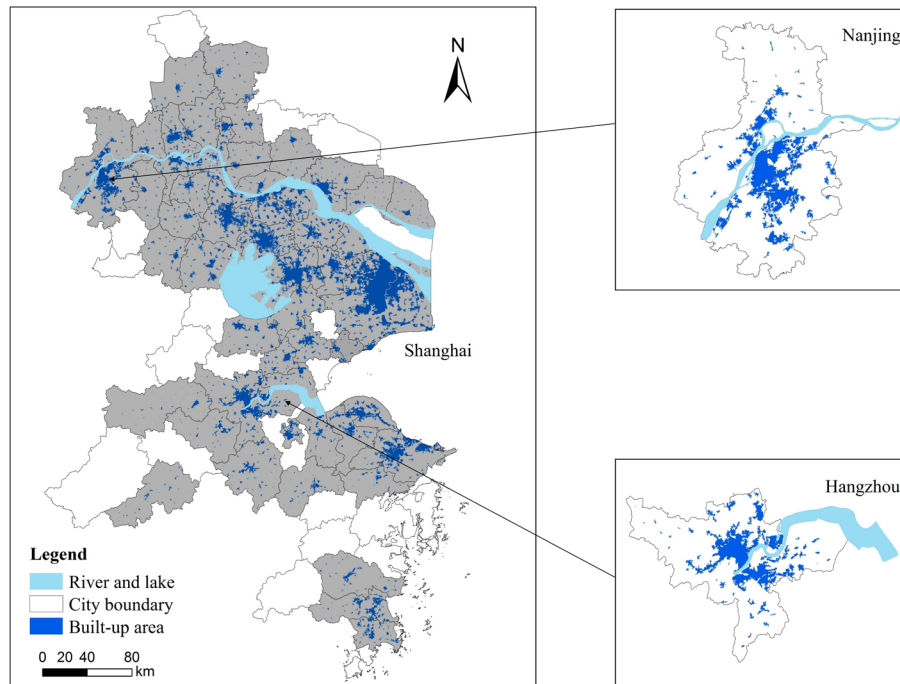


Figure 1. Location of the 50 cities in the Yangtze River Delta region in eastern China

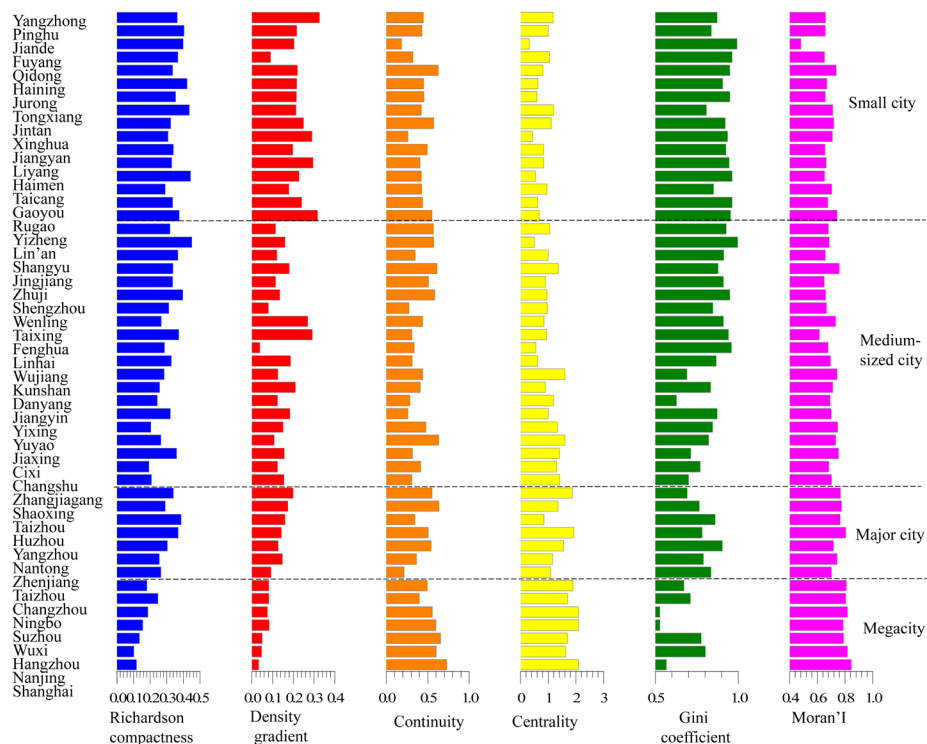


Figure 2. Variation of 6 spatial metrics among 50 cities in the Yangtze River Delta region
 Note: according to statistical yearbook of 2009 from National Bureau of Statistics of China, 50 cities are divided into four categories: megacity (more than 1 million people), major city (0.5~1 million people), medium-sized city (0.2~0.5 million people), small city (less than 0.2 million people)

such as the type of centralized group, the type of scattering and so on (Fig. 3). The details are illustrated in the following paragraphs.

Type I involves the cities in the form of centralized group, including Shanghai, Nanjing, Wuxi, Hangzhou and Suzhou. For the five cities the continuity, centrality and Moran' I index are higher than those of other categories, indicating that the urban land patches in the city territory is balanced

and highly clustered (the high Moran' I), the central area occupies a big proportion (the high continuity), and the peripheral group land shows the trend to the heart (the high centrality). The shape compactness and density gradients are generally low, indicating that the central area is loosely formed. By investigating the real urban cases, the form may be related with the strong radiation effect of big city center of this type of cities, which leads to

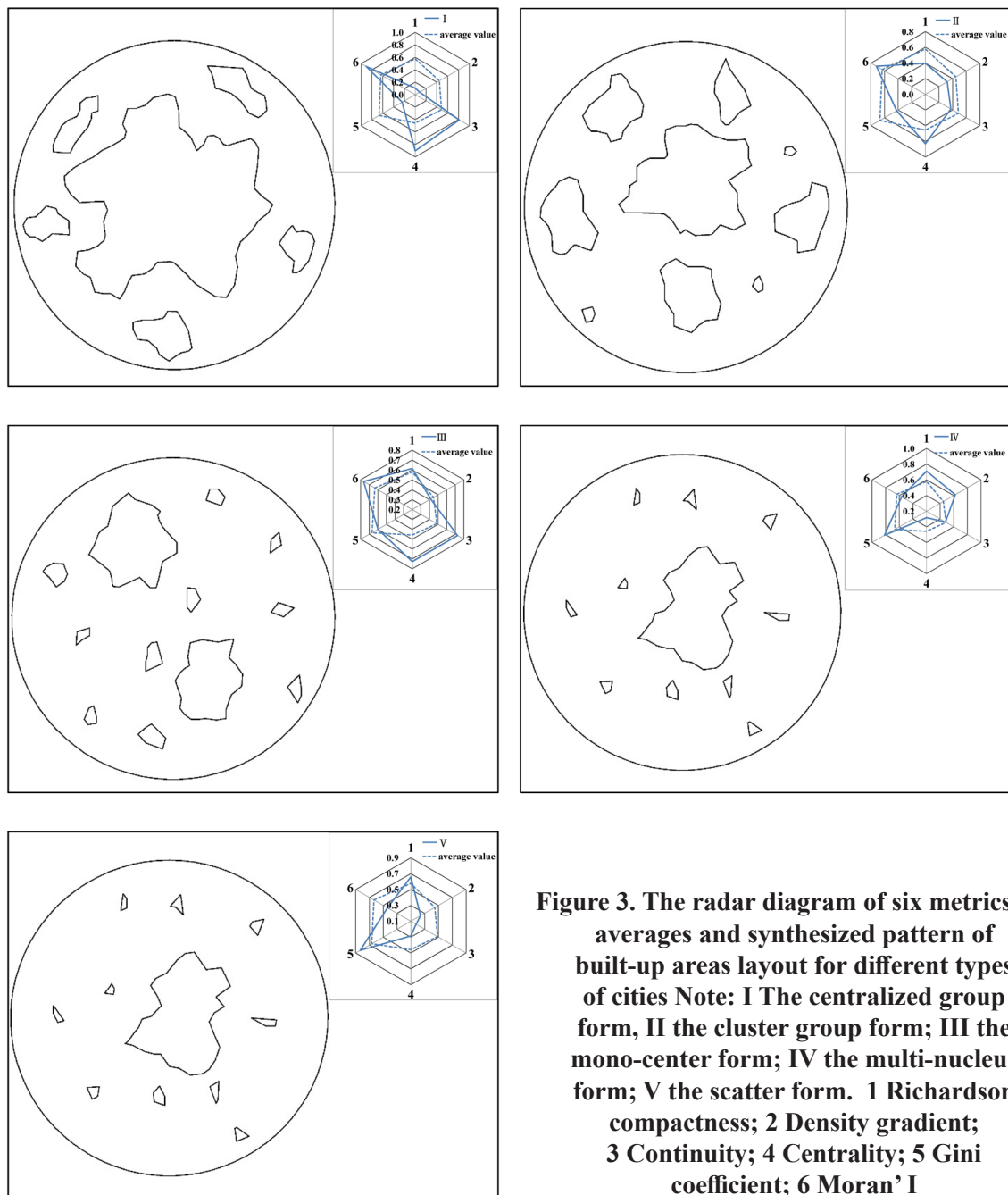


Figure 3. The radar diagram of six metrics' averages and synthesized pattern of built-up areas layout for different types of cities Note: I The centralized group form; II the cluster group form; III the mono-center form; IV the multi-nucleus form; V the scatter form. 1 Richardson compactness; 2 Density gradient; 3 Continuity; 4 Centrality; 5 Gini coefficient; 6 Moran' I

leaping development as well as extension from the center, the surrounding towns expanding to the center, and the overall urban intensity being high.

Type II represents the cities with a cluster group layout, including the three prefecture level cities of Ningbo, Changzhou and Zhenjiang, and the five county-level cities of Yuyao, Cixi, Jiangyin, Changshu, Zhangjiagang and Kunshan. The cities in this type have higher centrality index and Moran' I coefficient but lower continuity index, indicating that the proportion of the center area is reduced, and the peripheral urban clusters and the center together show the group layout. For the prefecture level cities, due to the more developed new towns and port areas, the central area declines in the dominant position. The county-level city is in the rapid development of industrial parks and township enterprises, which promote a great growth of towns catching up with the central city, accordingly performing a multi-cluster distribution pattern.

Type III represents the mono-center cities, including Nantong, Jiaxing, Yangzhou, Taizhou, Shaoxing five prefecture-level cities and Jingjiang a county-level city. The city type features high continuity index and high centrality index, indicating the prominent position of the central area; at the same time the Moran' I coefficient and Gini coefficient are higher than the mean, indicating the uneven distribution of urban land in the city territory. The central area gathering elements of resources in the polarization stage of development, grows faster than the surrounding and further attracts capital, technology, talent, services and other elements to continuously gather in the center. The gap between center and the external increases and enhances the distribution of single-center urban form.

Type IV is named as the multi-nucleus city form, including one prefecture-level city (Huzhou) and 24 county-level cities, the most of the YRD cities. The Gini coefficient is higher, indicating that the spatial distribution of the urban land is not balanced and concentrated in a few patches. However, the continuity index and the centrality index are lower, revealing that the central area has a low proportion and the other urban areas don't show centripetal

agglomeration. In addition, the Moran' I coefficient is lower, indicating that the overall degree of urban clustering is not high, and further reveals the "several dots" layout feature. Investigating the practical cases, the size of the cities belonging to this category is generally small, and the economic activities are concentrated in several towns with outstanding development advantages in the territory, which constitutes the nucleus of urban development.

Type V features a scatter form, including a prefecture-level city of Taizhou and Linhai, Wenling, Fuyang, Shangyu, Jiande five county-level cities. The contiguity index and the Moran' I coefficient of these cities are the lowest among all categories, indicating that the size of the central area is not dominant and the overall degree of agglomeration is low. Gini coefficient is the highest in five categories of cities, showing that the urban development is very uneven. In general, the development of land within the domain is low, and do not have the characteristics of centripetal organization, showing a strong dispersion. Investigating the real scenarios of this kind of cities, the layout of urban development is affected by the natural division of the mountain and the hills as well as the spontaneous construction along roads. The built-up area often appears narrow strips, and the structure of the urban land use is relative loose.

For the above five different types of urban compactness, the biomass loss for urban expansion between 2000-2010 is calculated with the biomass spatial data, and the results show that the average loss of urban type I is the lowest, the average loss of type V is the highest, the average loss of IV is the second highest, and the average loss of type II is not much different from that of III (Table 3). Based on the morphological characteristics of five types of cities and their biomass loss assessment results, it can be seen that the types with central agglomeration or aggregation around the central group (I, II, III), present the lower biomass loss rate, and accordingly perform better for the ecological efficiency. The development of multi-nucleus and discrete cities is easy to lead to greater biomass loss. This conclusion is consistent with the general understanding of the compact city, and

reasonable. In order to eliminate the interference of other factors, we calculated the population density and economic density of each type of city, and found that these factors do not have obvious regularity between the various types, and there is no significant correlation with most of the morphological indices. This indicates that the classification results are not affected by these population and economic factors, with independence and stability for featuring urban form. Although the natural conditions such as terrain and vegetation cover influence the spatial distribution of biomass and further influence the biomass loss, the difference existing at the small scale in local area can be neglected considering the average of the city scale. Therefore, we believe that this result can be used to guide the urban planning in the study area. In order to maximize the effects of the compactness, the city should choose a centripetal and clustering structure: for the city with a stable dominant center, the new clusters should be located around; for the small and medium-sized cities at the fast growth stage without a strong center, strengthen and expand the central area is conducive to the formation of a compact and efficient form.

Conclusion

In the Yangtze River Delta, where the urban population density is high, the urban spatial compactness is diverse, involving the geometric compactness of the central city, the close relationship between the center and the periphery, and the global agglomeration. Five different types of representations are defined as the basis for the performance assessment and planning of urban spatial structure. The analysis manifests that the compact structure of centripetal gather can play a better ecological benefit. For the small and medium-sized cities which are in the stage of growth and not forming a strong center, it is beneficial to strengthen and expand the central group to form a compact and efficient form structure. The current study only takes this dimension of biomass to account for the stability and significance of the compactness classification, which should be used for more evaluation of

the effects of urban morpholog .

References

- Angel, S., Sheppard, S. C. & Civco, D. L. (2005) The dynamics of global urban expansion. Work report by Transport and Urban Development Department, World Bank, Washington, DC.
- Brueckner, J. K., Fansler, D. A. (1983) 'The economics of urban sprawl: theory and evidence on the spatial sizes of cities', *J. Rev. Econ. Stat.* 65(3), 479-482.
- Chen, S., Yao, S. & Wu, J. (2009) 'Policy instrument of urban growth management and its effectiveness in Nanjing', *Acta Geographica Sinica*, 64 (4), 487-497 (in Chinese).
- Cole, J. P., (1964) 'Study of major and minor civil divisions in political geography', University of Nottingham, Mimeograph (presented to the 20th international Geographical Congress, Sheffield)
- Burton, E. (2002) 'Measuring urban compactness in UK towns and cities', *Environment and Planning B: Planning and Design*, 29 (2), 219-250.
- Fang, C. & Qi, W. (2007) 'Research progress and thinking of compact city and its measurement methods', *Urban Planning Forum* (4), 65-73 (in Chinese).
- Galster, G., Hanson, R., Ratcliffe, M. R., Wolman, H., Coleman, S. & Freihage, J. (2001) 'Wrestling sprawl to the ground: Defining and measuring an elusive concept', *Housing Policy Debate*, 12, 681-717.
- Li, G.-Y., Chen, S., Zhang, H. & Zhang, T. (2016) 'Variation of spatial estimation and distribution of vegetation biomass in Yangtze River Delta during 2000-2010', *Journal of Ecology and Rural Environment*, 32 (5), 708-715 (in Chinese).
- Ma, L. & Jin, F. (2011) 'Evaluation of Chinese urban compactness', *Progress in Geography*, 30 (8), 1014-1020. (in Chinese)
- Hagen-Zanker, A. & Timmermans, H. (2008) 'A Metric of Compactness of Urban Change Illustrated to 22 European Countries', in L. Bernard, A. Friis-Christensen & H. Pundt (eds.), *The European Information Society*:

- Taking Geoinformation Science One Step Further (pp. 181-200), Berlin, Heidelberg: Springer Berlin Heidelberg.
- Huang, J., Lu, X. & Sellers, J. M. (2007) 'A global comparative analysis of urban form: Applying spatial metrics and remote sensing', *Landscape and Urban Planning*, 82 (4), 184-197.
- Richardson, H. W. (1973) *The economics of urban size*, Saxon House, Mass.
- Silva, M. (2016) 'Urban morphology and energy: progress and prospects', *Urban Morphology*, 20 (1), 72.
- Tsai, Y. H. (2005) 'Quantifying Urban Form: Compactness versus "Sprawl"', *Urban Studies*, 42 (1), 141-161

Stages in the configuration of urban form in urban development planning: the emerging role of open spaces as sustainability mechanism. The case of Valladolid (Spain)

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Abstract. *Along the last five decades and through three different stages, the urban development plans —general plans— of Valladolid, a medium-sized Spanish city, show an interesting evolution in the way of configuring the global urban form and controlling urban development that we can also find in other similar Spanish cities. In the sixties and seventies, plans proposed ‘autonomous’ expansive schemes foreseeing a huge rate of urban growth, so they defined wide areas to be urbanised through new transport infrastructures and typical zoning mechanisms. In the eighties, after decay in urban and economic development and during the transition to democracy, the new local governments focused on the existing city and fostered a more controlled urban growth. However, plans continued to employ the same tools to manage future urban form —definition of transport infrastructures and sectors to be urbanised—, although they looked for more ‘controllable’ forms, such as radio-concentric ones, aiming at a gradual and homogeneous implementation —compact city—. When real-estate market recovered in early nineties, this strategy revealed its weaknesses: fragmented urban fringe and tendency to a congestive model, reinforced when a new generation of expansive plans drove these schemes out of the limits they were conceived with. However, an alternative and more sustainable model had already emerged, as some new urban planning tools proposed a change of perspective: managing global urban form not through future urbanised spaces, but through open ones, generating an ‘empty’ network able to give coherence to the whole urban structure in a metropolitan scale.*

Keywords: Urban development planning, urban model, open spaces, Valladolid, Spain

Introduction

The term of ‘urban morphology’ is related to different urban research traditions. One of the most influential is the Conzenian school, whose antecedents are the work of some German geographers at the end of nineteenth century. Their starting point was ‘the scope that existed for recognizing within town plans the stages in their development’ (Whitehand, 2001, p. 104). That approach concerns town plans understood as the result of different urban processes of both growing and transformation, whether these processes were planned or not.

M. R. G. Conzen developed this approach

through new concepts such as urban fringe or morphological frame. The latter relates to the morphogenesis, specifically during the transformation of rural land to urban tissues. The forms that are created at that time show ‘a powerful long-term influence’; ‘town plans are powerful influences on future forms, with residual features being passed down through successive generations of society, often over very lengthy periods’ (Whitehand, 2001, p. 106).

Considering these processes of generation of new urban spaces, they can also appeal to town plans understood not as a result, but as a project. Urban development planning deals

precisely with the transformation of non-urban areas into urban ones, proposing a more or less defined form, according to their scope. These forms that plans propose are the result of different influences and, as pointed, they are themselves a powerful influence, even though the plan is revised or substituted by a new one before becoming the real town plan. Thus, it is also possible and very interesting to analyse the stages in the configuration of urban form in urban development planning, comprising the characterization of the influences affecting every stage and the influence of every of them in the next ones. Following the Conzenian term, this paper aims at defining successive 'morphological periods' in urban development planning in the Spanish city of Valladolid.

Regarding this aim, it is first necessary to set the concept of urban development planning, as it comprises a wide range of planning tools with very different scopes. This paper focus on urban development planning tools whose scope comprises the whole city, namely planning tools defining the global urban form. Thus, it concentrates on urban structure and the way it is defined rather than on typological analysis. In the Spanish case, this kind of tools corresponds to the so-called Planes Generales de Ordenación Urbana or general plans, whose main objective has consisted of planning the urban development of the whole city, defining those areas to be urbanised in the short and in the long term along with the structure supporting this growth.

Second, it is also necessary to justify why Valladolid has been chosen as case. Valladolid is a medium-sized city located in the centre of the region of Castilla y León, in the north-west of inner Spain, and along the last five decades, it has experienced an impressive urban growth. At the end of the fifties it had only 150,000 inhabitants, and it is now the centre of a metropolitan area with 400,000 inhabitants, three quarters of them corresponding to the city. This growth was to be managed through different general plans; among them, two comprising the city and two comprising both the city and its metropolitan area can be highlighted. Beyond its specific characteristics and proposals, these plans represent the trends in Spanish urban planning along this period to

be also found in other similar Spanish cities. Regarding urban form configuration, they define three clear stages that could be explained as the evolution of general plans towards more place-based proposals.

The sixties and seventies: autonomous schemes for an expansive urban growth

From early sixties, Spanish economy experienced an impressive growth that was accompanied by a huge urban growth. In fact, a clear connection was established by the politicians between both phenomena, so it was stated that urban growth would reinforce economic growth. Consequently, the Spanish government promoted an expansive urban policy that required a new generation of urban planning tools.

The first Spanish Land Property and Urban Planning Act had been approved in 1956. This act created the general plans as the main tool within urban law in charge to plan urban growth in every municipality. These plans were to be coordinated at a provincial and even national level, and were also to be developed through other planning tools affecting sectors to be urbanised or transformed. However, the implementation of this act was slow and partial. Some municipalities approved their general plans, but they continued to follow schemes and to use mechanisms that they had been using since nineteenth century. The Ministry of Housing, created in 1957 to assume all competences concerning urban planning and development, decided to act by itself and it developed a lot of urban projects even though the general plans of the municipalities had not included them. At the same time, it put pressure on municipalities so they approved new general plans fostering urban growth.

The case of Valladolid is very representative of this process. During the sixties, the population grew more than 50% and that involved a remarkable urban transformation. A lot of neighbourhoods became densified and new residential zones for workers were built in some little vacant spaces among them. This transformation was mainly controlled by local real estate developers supported by the



Figure 1.

**Metropolitan Plan of Valladolid, 1970.
Road network: plan of stages**

municipal government, which was reluctant to update the obsolete urban plan that had been approved in 1939. However, at the end of this decade, when these local developers were also looking for new ways of getting profits from urban growth, the local government finally accepted the suggestion of the Ministry of Housing to elaborate a new general plan.

At that moment, the Directorate-General for Urbanism was also looking for new ways of configuring urban growth. Most general plans that had been approved until then were rather traditional plans of expansion through ensanches, but that did not satisfy the requirements of the great urban growth that Spanish cities were experiencing. Rejecting the typical monocentric model, the 'directional growth' became the best solution (Terán, 1982, p. 402-3). This new urban model came from the theories developed by C. A. Doxiadis, widely spread in Spain. This famous Greek architect defended that the traditional urban model, composed of centre and periphery, was no longer viable due to the expansion of cities. He then proposed the alternative of the 'dynapolis', so 'the modern metropolis can expand following a direction [...] centre and

periphery would keep a continuous balance while the city grows over vacant or uninhabited spaces' (Doxiadis, 1963, p. 112).

Regarding this new orientation of urban planning policies, the new general plan of Valladolid became 'the clearest example of directional planning, which has assumed the well-known proposals of Doxiadis' (Terán, 1982, p. 403). In 1968, the local government of Valladolid commissioned a team led by the architect Javier de Mesones the elaboration of this new general plan, but the Ministry of Housing decided that this plan would include not only the municipality of Valladolid, but also other 13 municipalities around it, in order to promote urban development at a metropolitan scale. The general plan became then a metropolitan plan.

Doxiadis had explained that the dynapolis 'would progressively take its geometric form through a rectilinear system of axes', and that grid would be organised through the 'human sector', 'basic element of widest urban zones as a whole' (Doxiadis, 1963, p. 112-5). The new metropolitan plan, which was finally approved in 1970, clearly assumed these ideas. Taking into account that the workers neighbourhoods were mainly located along the north and the east of the city, the plan proposed to foster the urban growth towards the southwest, which was also the direction of the main transportation routes connecting with Madrid and the northwest of Spain. Following this direction, the plan designed an ambitious grid of motorways that extends beyond the limits of the municipality of Valladolid ignoring any territorial constraint and that defines residential sectors for 20,000 inhabitants, while new industrial zones are placed at the east, close to workers neighbourhoods.

New transportation infrastructures and typical zoning mechanisms define an urban model that matches Doxiadis ideas and that is also 'a faithful reflection of the urban planning policy, prevailing in the sixties, impelled by Local and Central Administrations' (Figueroa Salas, 2000, p. 52). There is not any reflection on existing urban conditions, but reports that analysed the opportunities to contribute to economic development through urban growth. Valladolid had 235,000 inhabitants at the

beginning of the seventies, many of them living in bad conditions, but the metropolitan plan concentrated only on how to reach 780,000 inhabitants in 2003. Foreseeing this huge population growth, it proposed an 'autonomous' expansive scheme, an abstract and self-organised grid to make that growth possible. However, the economic crisis that burst just a few years later made this proposal unfeasible. Along with other factors, that resulted in a clear shift in urban policies that also affected the way to plan the urban form of the city.

The eighties: a radio-concentric model for a compact city

From the mid-seventies, Spain entered into a period of deep political and economic changes. The international crisis that burst in 1973 affected Spanish economy and stopped urban growth while the country was carrying out the transition to democracy after the death of dictator Franco in 1975. After the first democratic general election that took place in 1977 and once the new democratic Constitution was approved in 1978, the government called for the first municipal election on April 1979. Urban issues played a key role during that campaign. Left-wing parties such as the socialists or the communists pledged themselves to foster a radical shift in urban policies. They promised to focus on workers neighbourhoods, which were suffering severe deficits of basic urban equipment such as parks, schools, health centres, etc., and regarding urban growth, they rejected the expansive models that had been promoted but had become unfeasible. Eventually, these parties won the election in most important Spanish cities, including Valladolid, so they started to put their promises into practice, which involved the revision of general plans.

Beyond this reformist spirit, the new generation of general plans promoted by these new local governments assumed a 'dialectical relationship between structure and form, between structure and plan' (Calvo, 1990, p. 99). They looked for an integrated perspective combining two approaches: the parts defining

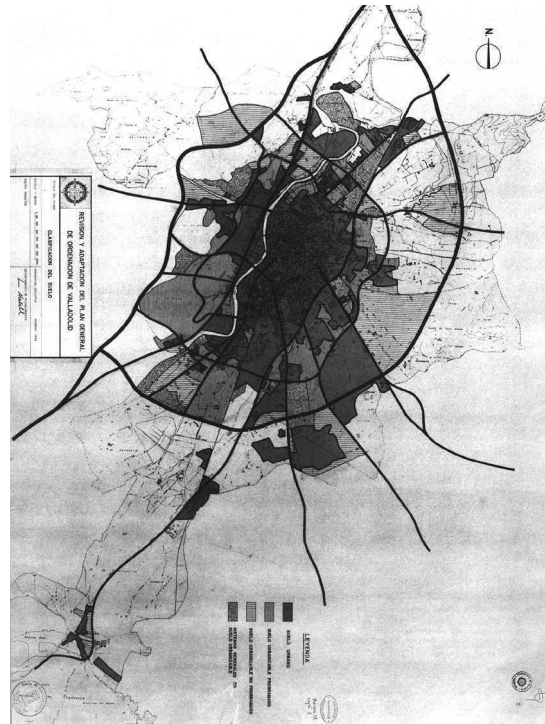


Figure 2.

**General Plan of Valladolid, 1984.
General Structure and land classification.**

the whole, and the whole defining the parts, i.e. they analysed and reflected on every part of the city so it would match the whole structure of the city, and they also checked that the addition of all parts would result in a balanced global structure. In this regard, they paid a particular attention to urban form at the intermediate scale, considering the existing city as the main reference and promoting its improvement in terms of reinforcing the coherence among the typologies, the network of streets and the planned or existing public spaces and buildings. All these features shared by most plans of that period were summarized by some authors under the expression of a 'more urban urbanism', so attached to the existing city that, in fact, 'the form of the city is the existing city itself, yet corrected and improved' (Solá-Morales and Parcerisa, 1987, p. 50).

However, the problem of future urban growth had also to be faced. As the previous expansive models were considered excessive and unfitted to the existing city, the objective consisted of finding a model that would continue to be expansive but that would also allow the continuity with the existing city and even its improvement. While the most innovative

effort concentrated on the re-definition of urban form within the existing city, the global urban structure was usually conceived from conservative schemes that had proved its efficiency, such as the radio-concentric ones. Aymonino (1981, p. 173-4) points that this scheme 'assumes a growth model based on a single political-administrative centre' and that it becomes 'the most suitable to foresee urban development —mainly composed of residential settlements—; indeed, these new sectors can be considered, within this scheme, as pieces to be added to a system that runs since preceding times [...] such as the system of the compact city'. Consequently, the radio-concentric model affirms the municipal power within metropolitan frameworks and it also sets the will to control urban growth, following this model of successive pieces that fit in a previously defined structure that emerges from the existing city and guarantees a continuity between what exists and what is planned. Valladolid and its new general plan, elaborated by a team headed by Bernardo Ynzenga and approved in 1984, are again a clear example.

This general plan aimed to get a 'spatially balanced and, specially, socially inclusive urban model, in contrast with the previous ones and assuming a radio-concentric spatial structure' (Fernández-Maroto 2015, p. 260). This radio-concentric scheme was composed of a double system of ring roads. The inner ring road was placed close to the existing periphery of the city, to fill in the spaces between it and this new road with new residential areas combined with public spaces to serve to both the existing and the planned neighbourhoods. Further away, the outer ring road defines a belt of residential sectors that would assume the urban growth in the long term and that define the final foreseen model of a compact city. However, this apparently isotropic scheme was altered by the effects of the metropolitan plan of 1970. Both ring roads are in fact uncomplete, as they connect with a motorway that follows the southwest direction that the metropolitan plan identified as the developing corridor to promote. Furthermore, the foreseen new residential sectors were to follow a programming that prioritized many located likewise in the southwest of the city. In fact,

most of them were previous projects of local real estate developers that the new general plan decided to assume.

Thus, this general plan made use of traditional planning tools such as transport infrastructures or residential sectors to complete the existing neighbourhoods or 'pieces' of the city with additional future ones. All of them would remain embedded in a radio-concentric scheme that would guarantee a gradual and homogeneous growth towards a bigger but compact city. 'The costs of imposing to territory this apparently right conceptual form [...] seem here high' (Solá-Morales, 1985, p. 11), but it was thought that the urban growth inertia towards the southwest could be controlled inside this scheme, and the illusion of a compact city prevailed. However, it turned soon into disillusion.

The nineties: the emergence of an alternative model in a fragmented territory

After the years of crisis, urban growth resumed from mid-eighties following economic

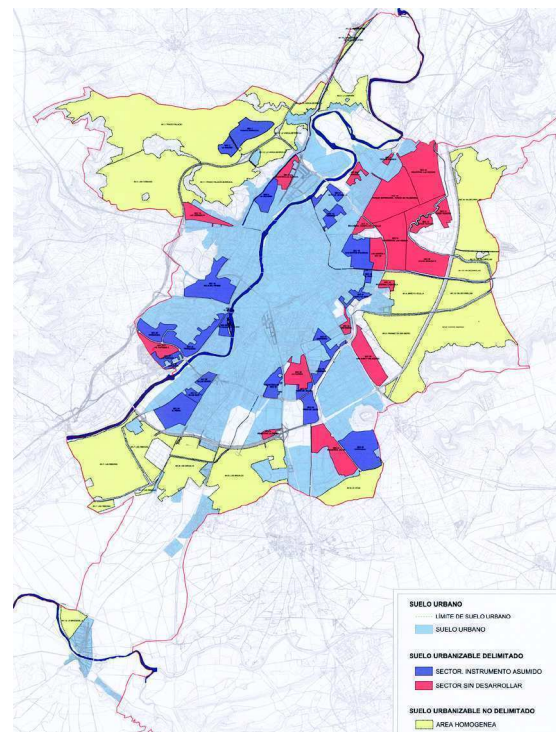


Figure 3.
General Plan of Valladolid, 2003.
Land classification.

development. Real estate market started a path of growth that briefly stopped between 1992 and 1993 but that progressively sped up since mid-nineties to the extent of generating a bubble that finally burst in 2008. As happened in the sixties and seventies, the role of real estate market in Spanish economy was fostered. First, investments were promoted through fiscal benefits. Later, actions related to urban law and practice were also taken. The Land Property and Urban Planning Act was reformed in 1998 to increase land offer to be urbanised, and municipal governments promoted the revision of general plans to put this policy into practice. Within this context, 'the question of urban planning, of the construction of the city, give in to the question of land, of the management of land market' (Roch Peña, 2001, p. 6). The concern on urban form and its cultural and social significance that existed in the eighties disappeared in practice.

In Valladolid, new residential sectors started to be developed from mid-eighties, all of them located in the south of the city. At the same time, some other municipalities close to this part of the city started to attract population that used to live in Valladolid, especially young people who found good dwellings at a better price than in the city. Ignoring the principle of territorial balance that the general plan approved in 1984 included, the municipal government of Valladolid reacted to this phenomenon and it promoted a complete new neighbourhood in the south of Valladolid after buying some land there. However, that action did not stop the move of people from the city to its surrounding municipalities, especially to those located in the southwest, the traditional and always promoted axis of development.

These surrounding municipalities had started to revise their general planning tools to increase the quantity of land to be urbanised and the municipal government of Valladolid decided eventually to employ the same strategy. The radio-concentric scheme that was defined in the eighties was driven out of the limits it was conceived with when a revision of the general plan was approved in 2003. Although numerous residential sectors that have been foreseen close to the existing city had not been developed, new ones were defined beyond

the outer ring road, without thinking in a new scheme to assume that kind of expansion. It was a 'hyper-forecast of urban development [...] with no coherence regarding its strategical points' (Rivas Sanz, 2008, p. 289), a plan with no urban form, as spatial mechanisms are completely absent.

When real estate market fell down in 2008, the consequences of this uncontrolled urban growth revealed themselves. Urban development had driven some parts of the city to a situation of congestion, with an excessive concentration of new residential zones, whereas some other parts became failed, as some zones were urbanised but not occupied, remaining half-empty. Emerging urban centralities were also bad managed, as several malls were promoted even though there was not enough demand to make them viable. This expansive urban model left behind a fragmented urban fringe, a condition that has been pointed as the main characteristic of contemporary cities, in opposition to 'the image of a regular, isotropic and infinite urban space, purified of any contingent character' (Secchi, 2004, p. 150). The kind of urban space that was foreseen

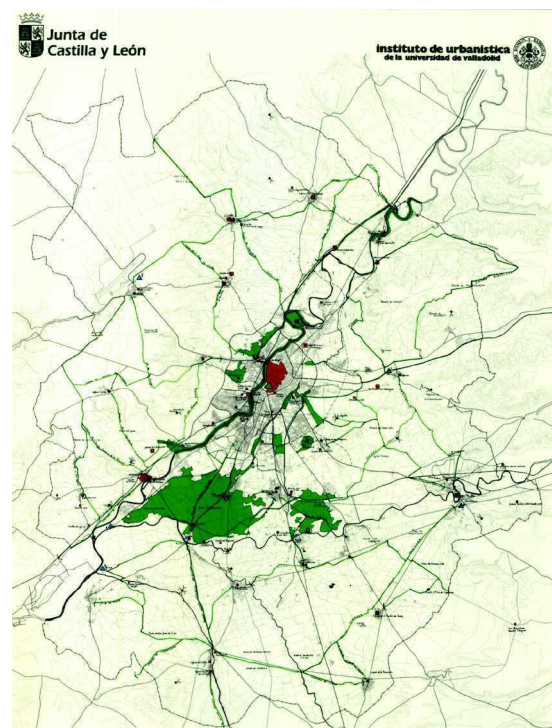


Figure 4.
Land Planning Guidelines for Valladolid, 2001.
System of parks and green corridors.

in the eighties and that revealed itself as unfeasible in the nineties. The question is then how to manage urban form within the context of the diffuse city.

In this regard, an alternative and more sustainable model had already emerged in Valladolid during the years of expansive growth. When the regional government of Castilla y León assumed competences in urban issues from mid-nineties, it approved a Territorial Planning Act that included new urban planning tools regarding metropolitan areas. Consequently, it commissioned the elaboration of the Land Planning Guidelines for Valladolid and its surrounding area, whose objective was to establish some criteria to manage urban growth without affecting the competences of municipal governments, which obviously constituted a great constraint. However, this new and innovative planning tool overcame this barrier by proposing a new perspective to define urban form at a metropolitan scale. The Land Planning Guidelines were not allowed to decide where to locate new urban areas, but they were allowed to prevent urban growth in those areas that merit a protection, due to its ecological or productive values. After thoroughly analysing the characteristics of the territory in the whole metropolitan area, the Land Planning Guidelines defined several spaces to be protected: the so-called Areas of Singular Ecological Value, which are the most important natural spaces, and the so-called Most Valuable Agrarian Landscapes, which are linked to historic infrastructures that had defined the structure of the territory. Furthermore, the Land Planning Guidelines proposed a metropolitan system of parks and green corridors to be 'the moderative key of dispersed growth and the guarantee of the positive quality of settlements system' (Rivas Sanz, 2010, p. 313).

Thus, they proposed a structure for the whole metropolitan area to be built upon a system of protected spaces and green corridors. Open spaces and the 'empty' network that would connect them emerged as the best way to define urban form in the context of the diffuse urban growth and the fragmented territory. They aimed at giving coherence to the whole urban structure in a metropolitan scale,

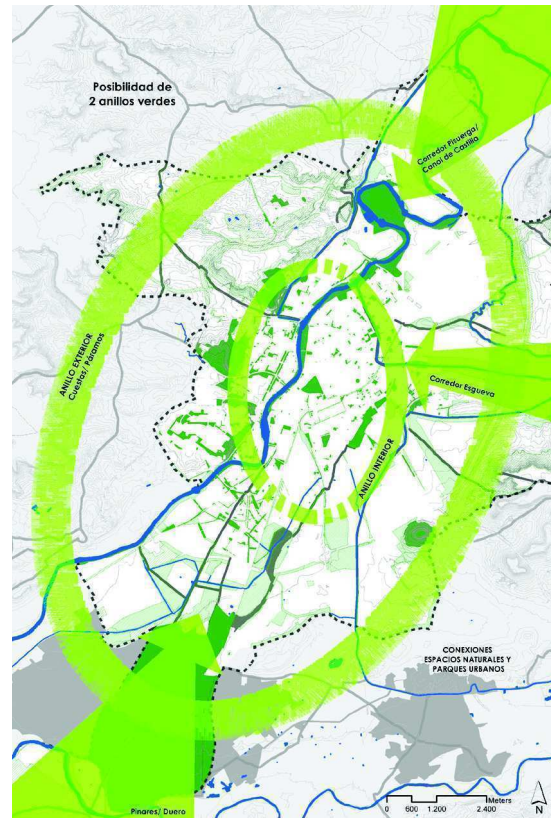


Figure 5.

General Plan of Valladolid (Advance), 2012. Scheme of inner and outer green belts

while the traditional mechanisms consisting of defining the zones to be urbanised were risking its sustainability.

Conclusion

Planning cities or metropolitan areas through an alternative system based on non-urbanised spaces and corridors is emerging as a more sustainable urban model. The process described in the case of Valladolid can also be found in other similar Spanish cities. For instance, the Accompanying Plan for the International Exhibition that took place in Zaragoza in 2008 proposed a network of green spaces related to various rivers and waterways. Gathering all reflections regarding this question that had been conducted for more than 15 years, this proposal aimed at giving coherence to the whole urban structure by guiding urban regeneration actions. The pioneering and most known case is Vitoria and its Green Belt, a comprehensive project for

the whole periphery of the city that started in the eighties as a way to avoid floods and that later had to face expansive strains regarding new residential areas that put it at risk.

This kind of new urban networks is more and more related to a shift in city management summarised through the expression 'grey to green' (CABE, 2009), which means that traditional 'grey' urban infrastructures such as roads or canals can be substituted by more place-based, green mechanisms, which results in a more sustainable management of urban metabolism. However, it can also be read as a shift in urban form planning. In the context of the diffuse city, closed schemes employing these same 'grey' systems as planning mechanisms are not able to control urban growth, which is nowadays fragmented and depends on a multiplicity of decisions that are impossible to foresee. It is thus important to define an underlying scheme ensuring a more resilient and sustainable urban development. The challenge consists of integrating this alternative model in usual urban planning, which continues to be very depending on those traditional mechanisms regarding the definition of future urban form. This new way is nevertheless little by little paved. After the bubble burst, Valladolid is now revising its general plan, and the advance document that was approved in 2012 to guide the revision proposed a new perspective on general urban form that is structured upon an inner and outer green belt. Following the spirit of the Land Planning Guidelines, these green belts are to assume the role of the inner and outer ring roads, which have been guiding urban form in the last thirty years.

Acknowledgments

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References

Aymonino, C. (1981) El significado de las

ciudades (Blume, Madrid).

Doxiadis, C. A. (1963) *Arquitectura en transición* (Ariel, Barcelona).

Fernández Maroto, M. (2015) 'El Plan General de Valladolid de 1984. En los orígenes de un nuevo modelo urbano', *Ciudades* 18, 255-63.

Figueroa Salas, J. (2000) *La medida y la memoria: antología urbanística de Javier de Mesones 1950-2000* (Fundación Metrópoli, Madrid).

CABE (2009) *Grey to green. How we shift funding and skills to green our cities* (<http://www.designcouncil.org.uk/sites/default/files/asset/document/grey-to-green.pdf>) accessed 20 May 2017.

Calvo, L. (1990) 'El control del crecimiento urbano', in Instituto del Territorio y Urbanismo and Instituto Universitario di Architettura di Venezia, 10 años de planeamiento urbanístico en España 1979-1989 (Ministerio de Obras Públicas y Urbanismo, Madrid) 97-104.

Rivas Sanz, J. L. (2008) 'Ayuntamiento y urbanismo', in Merino Estrada, V. and Orduña Rebollo, E. (coord.) *La ciudad de Valladolid y su Ayuntamiento: 100 años de historia común* (Ayuntamiento de Valladolid, Valladolid) 271-94.

Rivas Sanz, J. L. (2010) 'La ordenación de los procesos metropolitanos: las directrices de ordenación territorial de Valladolid y de su entorno (2001)', in Vinuesa Angulo, J. and Galiana Martín, L. (ed.) *Teoría y práctica para una ordenación racional del territorio* (Síntesis, Madrid) 301-20.

Roch Peña, F. (2001) 'Hegemonía inmobiliaria y desregulación urbanística: el declive del Plan creador', *Urban* 6, 6-14.

Secchi, B. (2004) 'Ciudad moderna, ciudad contemporánea y sus futuros', in Martín Ramos, A. (ed.) *Lo urbano en 20 autores contemporáneos* (Edicions UPC, Barcelona) 145-58.

Solá-Morales, M. (1985) 'Valladolid: la constante reforma de crecer sobre sí misma', *UR-Revista de Urbanismo* 1, 2-19.

Solá-Morales i Rubió, M. and Parcerisa i Bundó, J. (1987) 'El urbanismo urbano: forma urbana y planeamiento urbanístico en siete capitales españolas', *Estudios*

- Territoriales 24, 33-51.
- Terán, F. (1982) Planeamiento urbano en la España contemporánea (1900/1980) (Alianza, Madrid).
- Whitehand, J.W.R. (2001) 'British urban morphology: the Conzenian tradition', Urban Morphology 5(2), 103-9.

The substratum permanent structures of Roman Valencia

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Abstract. *The shape of the territory and the urban settlement of numerous Valencian cities were strongly conditioned by the original imprinting of Roman planning, characterized –as it is known– by large scale infrastructures, by settlements of orthogonal axes and by the allocation of the plot division into square modular divisions called centuriae. All the later interventions took necessarily into account such structures, which underwent numerous transformations over time, especially from the second half of the twentieth century. Then innovations and developments in modern technology contributed –more than in any other period– to neglect and override the traces of the original configuration. Territorial and urban research into Roman structures in the Italian peninsula has allowed the recognition of a sufficiently large number of plans, thus allowing the development of a complete general research method to read analogous structures in different Romanized territories. The authors now propose to apply this method to the territory of the Valencian Community. The rectilinear outline of Via Augusta with its forking side paths, the orthogonal signs of the agrarian fabric, the military milestones and the administrative divisions suggest, also in this case, the possibility of retracing the original pattern. Its structure could contribute, among other things, to explain the logic of the expansions outside the walls of the historic centre of Valencia that might otherwise seem arbitrary and meaningless.*

Keywords: Roman Valencia, substratum permanent structures, city planning, historical transformations

Introduction

This conference paper is the result of a joint research started by the mid-1990's and suspended because of a lack of funding by the European Community. The research was basically part of a series of educational and cultural initiatives involving, in various areas, researchers teams from the Facoltà di Architettura di Firenze and from the Escuela Técnica Superior de Arquitectura de la Universitat Politècnica de València (Cataldi and Corona, 2002). After more than 20 years, on this important occasion, placing Valencia at the centre of international attention on the Urban Morphology studies, we considered it appropriate to resume the hypotheses from that

time in order to update, confirm and compare them with recent studies on the urban form of Rome (Cataldi, 2016) and Florence (Cataldi, 2017, in print). The “substratum permanent structures” of Roman territorial planning (centuriations, first of all) seem to play, in our opinion, a very important role due to their binding presence in the urban transformation processes in the countless European cities of Roman origin.

The method of ‘reading’ and the hypotheses of Forma quadrata theory

Territory is a kind of huge spatial solid palimpsest, which bears the “structural signs”

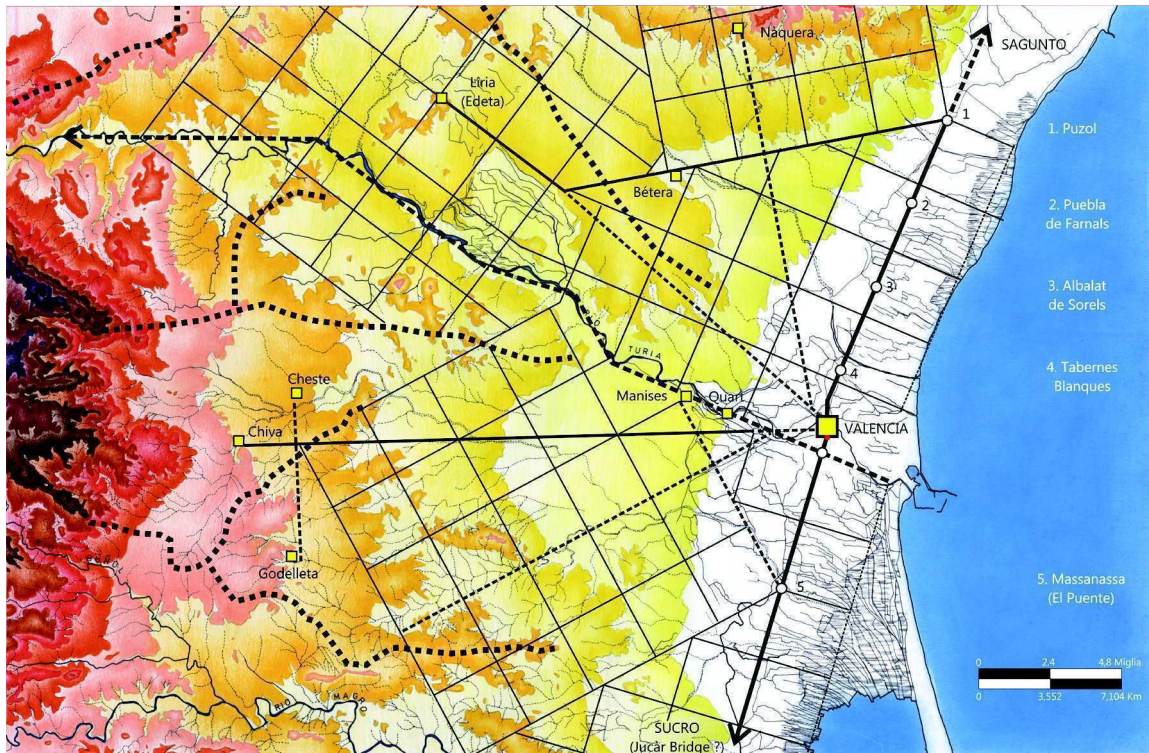


Figure 1.

Hypothetical reconstruction of the Roman planning of Valencia's territory in the imperial period.

introduced by men, overlapping and reusing them over the course of time (Cataldi, 1977). So territory, in this sense, can be considered as the only big book that cannot be counterfeited in the history of humanity, nowadays spread over the entire surface of the planet. The reading of this book is generally made by pulling off the layers of the different stratified systems of signs that, as the chapters of a tale, all together give shape to the plot. The semantic key element of each diachronic "tale" logically depends on the degree to which the inherited structures are reused, whose "essential" components (that cannot be missing) –conventionally divided at a methodological level– are settlements, fabrics, routes and limits (Cataldi, 2009, P. 141). Interpretative difficulties about the phase changes stem from the fact that the new settlements' systems of signs are, normally, the concrete expression of mental abstract programmes (projects).

The substratum structures of the Roman period, as well as those of other previous ridge-top phases (Cataldi, 1977, pp. 45- 46) are the most persistent: probably because they initiated the right of private property in the western world,

i.e. the possibility of passing along lands and properties to heirs. The Forma quadrata theory is the result of multiple convergent readings of territories planned by Romans (Cataldi et al, 2000; Cataldi 2007; 2016; 2017). Due to length restrictions, on this occasion we can just suggest two fundamental hypotheses of this theory, based on the assumption that Roman surveyors designed their plans on measured maps called formae, technically created on geodesic squared meshes with oriented modular coordinates secundum caelum, with clearly reducible dimensions (scale-related), starting from an ager of twelve square miles, through the saltus (1/25th of the ager) to end with the centuria (1/25th of the saltus). As on a squared paper, they then designed the colonial plan on a map, establishing on the geodesic mesh the best direction (from a hydraulic point of view for the rainwater runoff) for the two axes cardo and decumanus of the new squared planned unit (with the typical dimensions of an ager oriented secundum naturam), using for this task certain relations of integers univocally fixed, on maps and on the land, in reference fixed points of the geodesic mesh (Cataldi,

2007; 2016).

The regional plan of Roman Valencia (Figure 1)

- The two straight layouts of Via Heraklea – Augusta.

The layout of Via Heraklea-Augusta, north of Valencia's plain, is well-known and it is not difficult to find the marks of Roman centuriation on it. It is clear to notice that the road's straight layout and its counter axis, based at the end of the Turia River valley, cross themselves orthogonally in the proximity of what would become the city of Valencia.

However, what is less clear –and strengthens the findings reported in this paper– is its study in the light of what we called *Forma quadrata secundum caelum*. Everything makes sense when we consider the coincidence of important territorial milestones and Roman urbanisation with the big 12x12 Roman miles squares (*Ager*) and its subdivisions in 25 *saltus* (Cataldi, 2017, in print).

According to this theory, the squared system *secundum caelum* oriented at cardinal points could be the primary system thanks to which Romans gained a general vision of their whole territory and the reference geographic system, useful later on to design, *secundum naturam*, communication roads and cities based on them.

This way, Valencia's territory has its northeast vertex in the settlement of Puçol, and the location of the Turia river mouth during the Romanisation period would be marked on its southern side, where counter-axis of the Turia valley starts. It must be noted that the coastal line in the foundational period of Valencia city should have been a few kilometres to the interior (Furió et al., 1999, p. 13).

It wasn't just a matter of drawing some points on a grid. The *Forma quadrata* allowed establishing, through simple relations with the mesh, the directions of different layouts. This way, the northern section of Via Heraklea has a 3:7 relation with the grid and, inversely, the end of the Turia river valley has a 7:3 relation.

It can't be seen as random the fact that settlements between Puçol and Valencia

(Puebla de Farnals, Albalat dels Sorells y Tavernes Blanques) are at the same distance on Via Heraklea's straight layout: it could be the topographic result of consecutive triangulations in order to keep the road layout straight.

If the straight northern section of the Via kept the same direction in the southern Valencia plain, it would end up encountering the hills. Thus, it was necessary to use a different ratio 3:10 in order to orient the itinerary with the foothill line and keep it in the plain, avoiding Albufera. It is not random that the Miguelete tower is nowadays its visual point of reference. The intermediate settlement Massanassa is placed close to El Puente, place-name indicating explicitly its strategic function of territorial control. It is placed as well on a possible topographic triangulation spot.

- The squared fabrics of plain (*centuriae*) and mountain (*saltus*)

However, Roman surveyors not only used the *ager* grid with its *secundum caelum* orientation (N-S, E-W). Following the analogy established in this paper with the procedures used in different Roman-founded places in Italy and especially Florence (Cataldi, 2017, in print), we could suppose that each of the two straight sections of Via Heraklea-Augusta might have served as axes generating big modular units (*agri coloniali*), with 12 Roman miles each side, divided into 25 *saltus* (5x5) in mountain areas and, in turn, divided in 25 *centuriae* (5x5) in more fertile plain areas. In the areas close to Valencia, this assumption is not just a mere hypothesis because it is easy to find a coincidence between the current agricultural and political divisions and the layout of the various aforementioned *agri*.

Continuing with the Florentine analogy, we can assume that, over the centuries, the layout of *agri coloniali* –with their consequent *saltus* and *centuriae*– presented more complex layouts, as they were based on the itineraries that connected the main city, Valencia, with the most prominent surrounding Iberian cities: Liria, Náquera and Chiva.

Urban developments of Roman Valencia

- The hypothetical squared founding castrum on the Turia River island (Figure 2).

Historians (Sanchis Guarner, 19721; 19885 , p. 22) and archaeologists (Escrivà Chiver et al., 2010, p. 30) seem to agree on the fact that Valencia was founded in the year 138 B.C. on one of the many river islands created by different branches at the Turia delta, close in that area to its mouth.

It doesn't seem that other settlers had established before in that location because no remains from other cultures have been found in the subsoil, underneath the first Roman settlement layer.

All this allows us to assume that the beginning of Valencia was a Roman military camp that would be settled on the highest spot of the biggest delta island of river Turia, in a spot that would let them control the location where Via Heraklea met the river. This settlement was even more successful because Valencia lays half way between the two main cities of the Republican period on the Mediterranean coast: Tarragona and Cartagena, 250 Km far from each of them (López-Davalillo Larrea, J., 1999, p. 69).

Tito Livio (Sanchis Guarner, 19721; 19885 , p. 22), from whom we got just a short summary, talks about Valencia as an oppidum, meaning a stronghold or walled city. However, given its strategic value for the protection of the location where Via Heraklea met the river Turia, we can assume that a castrum was initially located where later there would be the city of Valencia. This hypothesis coincides with the usual customs of the Roman army and has been detected in the founding of different cities, particularly in Florence (Cataldi et alii, 2000, p. 17; Cataldi, 2016, in print) which is our point of reference and contrast.

If we admit that the Florentine model is valid, we have to accept that the Valencian castrum was a settlement based on a squared cardo-decumanus structure of 1000 feet per side, to which 100 would be added as an area of belonging. Thus we get to 1200 feet per side, which equates to a quarter centuria. It seems logic that no remains of this have been

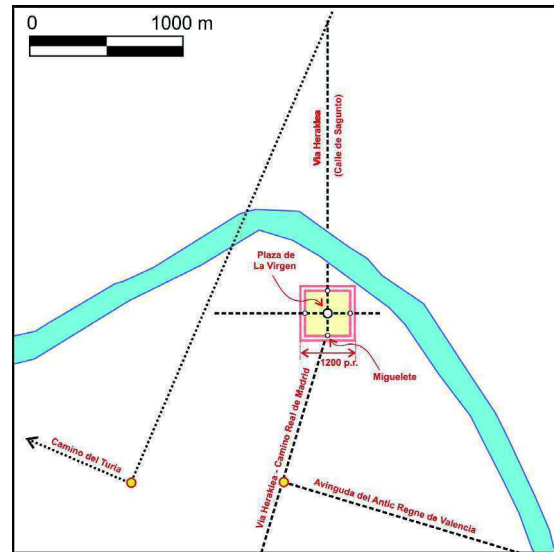


Figure 2.

Hypothesis on the original castrum in Roman Valencia.

found because of the lightness of the materials used for its construction (stockades and tents), especially if the new city would be built on it later on. Here, the research method based on reading the signs on the territory and on the current urban fabric is especially valuable to understand the shapes and infrastructures built in the past.

So for this reason we have to suppose that Valencia's castrum was placed on a big fluvial terrace elevated over surrounding lands and encircled by some of the many branches in which the river Turia was divided in this final section of its course, allowing an efficient defence and a better control over the river crossing. Cardo and Decumanus maximus probably were the same as the ones used later on in the city. This way, we could accept that the first settlement was a Roman squared camp, 1200 feet long, with the main cardo maximus axis being the same as the current calle de Navellos and its extension on the other side of the river: calle de Sagunto. The presence of this road, whose course still exists in the current urban fabric and has the same orientation as the cardo in the future city, is necessary to find the oblique line of Via Heraklea's northern section (3:7 ratio) and still maintains the place-name corresponding to Porta Saguntina. In the south, starting from Porta Sucronensis, Via Heraklea starts with a new orientation (3:10 ratio) which

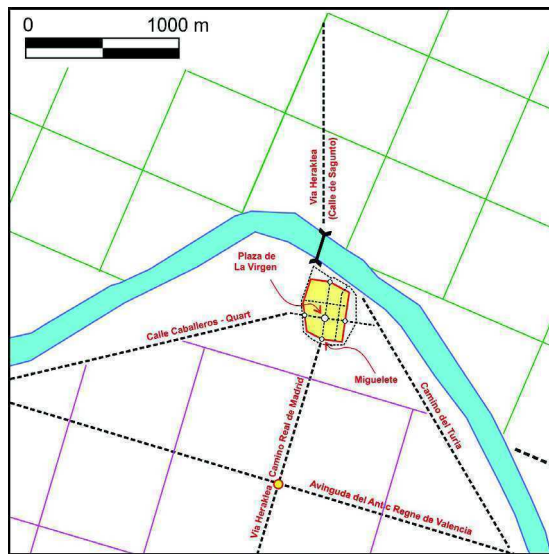


Figure 3.

Hypothesis on the urban form of Valencia in the Republican period.

allows avoiding the Albufera lagoon and the hills southwest of Valencia's plain. If this theory were true, the location for the construction of the Miguelete many centuries later wouldn't be random: besides its Cathedral's bell tower function, it would also be the perspective focus of Via Augusta, or better said, the visual point of reference of the southern section of the aforesaid Via.

Sometime after this camp, the oppidum that Tito Livio wrote about was founded (Sanchis Guarner, 19721; 19885, p. 22). We can assume that, starting from this moment, the layout of centuria fabrics started to be planned on the brims of the two straight sections of Via Heraklea. The existence of this initial spatial organisation is evident in transport infrastructures, rural ways, irrigation system and division among municipalities, and it strengthens the validity of the assumptions of this paper.

With the transformation from Castrum to Oppidum (Fig.3), the military camp becomes a colony and the place of the soldiers is taken by settlers, who normally would have been discharged soldiers (Sanchis Guarner, 19721; 19885 p. 24; Escrivà Chiver et al, 2010, pp. 53-54). According to the remains found and funeral uses, it seems that these first settlers came from central and southern Italy. The colonial city maintained the road structure and

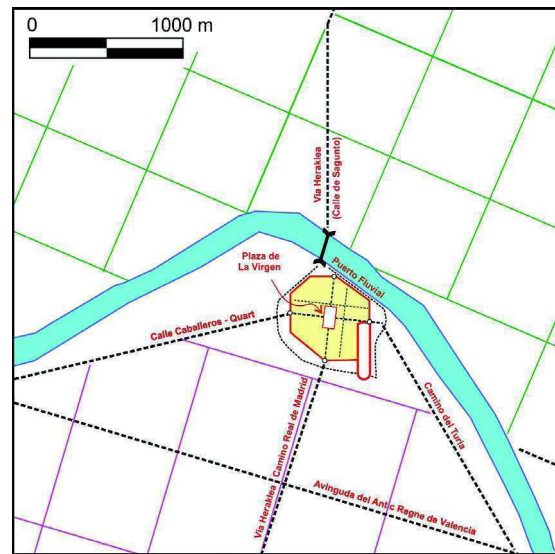


Figure 4.

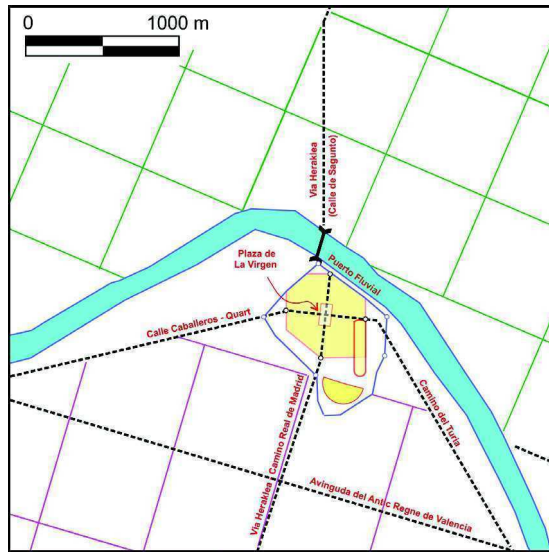
Hypothesis on the urban form of Valencia in the Imperial period.

increased its surface.

This paper suggests an interpretation of the location of a highly significant element, *cardo maximus*, which is not the same as the most accepted interpretation among Valencia's archaeologists (Escrivà Chiver et al., 2010, p. 46). In particular, it doesn't make sense that the northern connection were made through the current calle de Alboraia because this road is parallel to Via Heraklea and their connection would be impossible. However, if the *cardo maximus* laid on the current calle de Navellos, its logical extension being calle de Sagunto, which follows the same direction, the connection with Via Heraklea would be direct and, moreover, it is consistent with the urbanising Roman customs.

- The developments of municipium in the imperial period (Figure 4).

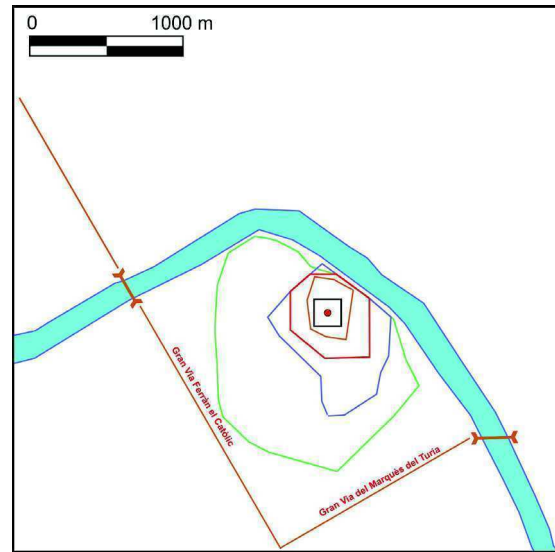
After a long period of almost complete abandonment that started with the destruction and burning of the city in the year 75 B.C. after the Civil War (Sanchis Guarner, 19721; 19885 , p. 26; López-Davalillo Larrea, J., 1999, p. 58; Escrivà Chiver et al., 2010, p. 58), the municipium of Valencia was reconstructed, but it maintained the basic structures layout and the fundamental location of the Forum, which was however reconstructed—even in its pavement—

**Figure 5.**

Valencia's Islamic walls seem to substantially follow the route of the second fringe belt of the imperial city, except from the southern route, whose expansion can be explained by the presence of a hypothetical theatre, that could be recognised over the basis of the current urban network signs.

and provided with important monumental buildings (Escrivà Chiver et al., 2010, pp. 50-57). Thanks to it, Valencia reached the rank of one of the main cities in Hispania. The walls follow a polygonal geometric layout. This layout –which we hypothetically reconstructed on the basis of its traces on the actual fabric of the external itinerary of the fringe-belt– seems to observe the typically Roman principles of symmetry and regularity. The Saguntina and Sucronensis gates, placed respectively in the far north and south of the *cardo maximus*, were built together with the corresponding wall edges, while the east and west gates of *decumanus maximus* seem to be placed at the centre of large walls.

The documented presence of an important circus in the southeast part of the city (Escrivà Chiver et al., 2010, pp. 37-39) allows to rightfully address the question of the existence of a theatre because, in Roman cities of the imperial period, it was customary for this important building dedicated to theatre performances to be constructed before the circus (Merlo, 1996). Likewise, it is possible that no remains of the possible theatre have been found yet, the same way that nobody talked about the circus of Valencia until a

**Figure 6.**

Synthetic representation of the development processes of the urban form of Valencia, besides the Islamic walls, including the 14th Century walls and the two Grandes Vías from the first years of the 19th Century.

few years ago when archaeological findings proving its presence were found. Again, the research method based on the reading of current fabrics allows to propose the hypothesis on the existence of the theatre assuming that it could have had an impact on the curved section of the Islamic wall in its southern route (Sanchis Guarner, 19721; 19885 , p. 44; (Figure 5).

Conclusion

From our paper, we can draw two conclusions:

In the case of cities with a Roman origin, the methodological need to inductively reconstruct, starting from current signs, the planned mesh of centuriations designed on the margins of the large consular roads. Unlike reductionist positions that only consider as valid the interpretations based on findings of material remains or documents of the time, the presence of layouts and landmarks that meet the Roman way of proceeding in the current fabric can be used to propose hypotheses on historic processes that generated cities and current territories. The layouts of roads and ways, the divisions in property and between municipalities are, if interpreted correctly,

just as real as the material remains, and they must become part of a global process aiming at understanding the past.

The need to analyse the influence that the ancient fabrics had on the modern planned structures. In this sense, the case of Valencia is exemplary: two of the main modern infrastructures, the railway line and the international airport of Manises, actually follow the orthogonal layouts of Roman planning based on *cardo* and *decumanus*. The knowledge and interpretation of facts that took place more than 2000 years ago is valuable in itself, but it is also useful to correctly understand the current situation and to distinguish between the aspects of reality that are a consequence of history and those which are just a matter of random chance.

References

- Cataldi G. (1977) *Per una scienza de territorio. Studi e note* (Uniedit, Firenze).
- Cataldi, G. (2007) 'La pianificazione antica del territorio', in Biagianti I. (ed), *La Valdichiana dai primordi al terzo millennio. Storia ragionata di un territorio* (Tiphys, Cortona).
- Cataldi, G. (2009) 'The planning-typological approach', *Urban Morphology*, 13, 140-143.
- Cataldi, G. (2016) 'A double urban life cycle: the case of Rome', *Urban Morphology*, 20, 45-57.
- Cataldi, G. (2017) 'Florence: the geometry of urban form', *Urban Morphology*, 21 (in print).
- Cataldi, G., Corona, R. (eds) (2002) *Logge e/y Lonjas. I luoghi del commercio nella storia della città / Los lugares para el comercio en la historia de la ciudad* (Alinea, Firenze).
- Cataldi, G., Iacono, P., Merlo A., (2000) 'La geometria di Firenze. Il progetto matrice della città e del territorio', in Cavallina, G. and Degl'Innocenti, P. (eds), *Architettura e contesto* (Dipartimento di Progettazione dell'Architettura, Firenze) 4-17.
- Escrivà Chiver, I., Ribera i Lacomba, A. and Vioque Hellin, J. (2010) *Guía del Centro Arquelógico de l'Almoina* (Ajuntament de València, València).
- Faus Prieto, A. (1997) *Cartografia Valenciana (Siglos / Segles XVI – XIX)* (Diputació de València, València).
- Furió, A., García, J., Martí, J., (1999) *Historia de Valencia*. (Editorial Prensa Valenciana, S.A., Valencia).
- Herrera, J. M., Llopis, A., Martinez, R., Perdigon, L., Taberner, F. (1985) *Cartografia historica de la ciudad de Valencia. 1704 – 1910* (Ajuntament de València, València).
- López-Davalillo Larrea, J. (1999) *Atlas histórico de España y Portugal. Desde el Paleolitico hasta el siglo XX* (Editorial Síntesis, Madrid).
- Sanchis Guarner, M. (19721; 19885) *La ciutat de València. Síntesi d'Història i Geografia Urbana* (Ajuntament de València, València).
- Merlo, A. (1996) *Il teatro romano di Segobriga, ricostruzione architettonico-funzionale e metodologie d'intervento, tesi di laurea* (Facoltà di architettura, Università di Firenze, Firenze).
- Yepes Piqueras, V. (2013) 'Conjectura sobre la existencia de puentes romanos sobre el Turia a su paso por Valencia', *Quadernos de diseño en la obra pública*, pp. 14-19.

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