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ID 1686 | WHICH STANDARDS FOR PUBLIC OPEN SPACE? A NEW CONCEPTION FOR THE 21ST CENTURY CITY

Yodan Rofe[1]; Marco Cremaschi[2]
[1]Ben-Gurion University of the Negev; [2]SciencesPo, Paris
yrofe@bgu.ac.il ; marco.cremaschi@sciencespo.fr

1 INTRODUCTION

What all historical centres have in common is that they are built along streets, and streets make up most of their public space. Streets make up between 25 and 35% of the land area of these urban centres. It is not too difficult to see the impact of modern ideas of city planning on the urban fabric. Watch whatever city on google maps and shift outwards to almost any new development begun in the latter half of the 20th century. All these areas are characterized by having fewer streets; greater distances between intersections; mid to low building coverage; either high or low rise buildings and density; but always extensive open spaces, mostly green areas.

Cities are made of buildings and the spaces between them, both private and public (Marshall, 2004). Planners and policy makers have invested more in the design and regulation of the built up areas, standards mandating parks and gardens being a notable though limited exception to the rule. The recent critique of contemporary urbanism, has stressed the need of interconnecting again the two separate halves.

In this paper we deal with the problem of what should we demand from public open space (POS) in the cities of the 21st century. In particular, we address the question of the balance between streets, public parks and gardens. Eventually, we ask the question of how much POS is needed and what are the best ways to supply it? Until fairly recently, “orthodox” planning culture would have answered unanimously in favour of more parks and gardens, a trait severely criticized by Jacobs in the following quote:

In orthodox city planning, neighborhood open spaces are venerated in an amazingly uncritical fashion, much as savages venerate magical fetishes… Walk with a planner through a dispirited neighborhood and though it be already scabby with deserted parks and tired landscaping festooned with old kleenex, he will envision a future of More Open Space (Jacobs, 1961, p. 96) .

Why this? And why has planning given up on streets as social spaces and relegated them to movement and access functions only?

In order to answer these questions, we first address the notion of open space and in particular of public open space (POS), sketching rapidly the intertwined elaboration of measures, forms, and needs. Dealing in particular with the UK, Italian and other European cases, we show that standards, far from being a plain policy tool, result from a complex web of policy assumptions.

Secondly, we propose an analytical framework to understand how standards rely, in different countries either on political justifications or technical measures. In fact, they are a non-neutral policy tool, often

justified by social, ecological and health reasons as well as technical knowledge. Any change of standards is in fact related to corresponding changes of a multi-layered policy and knowledge structure.

Thirdly, we dissect the consequences of POS standards, showing how they contribute to the creation of non-urban development and make it next to impossible to build dense, lively urban places. Further, we address the dilemma arising from the still ill-considered contrast between space and density, and between urban and metropolitan form. We are concerned in particular with the impact of POS standards on the possibility to achieve functioning urban neighbourhoods and projects.

In the conclusions, we suggest that time has come to allow our standards of POS to reflect the recent evolution of street standards recognizing them as an essential part of the public space. This move will reduce the need for public land in new development, while providing for a diversity of allocations and density as well as dynamic change. Even more important, it will require and incentivise the design of streets as real social space, adapting them to new urban and metropolitan contexts.

2 THE EVOLUTION OF PUBLIC OPEN SPACE STANDARDS

Urban streets and green areas are old love and hate affairs of cities, the story of modern cities being one of eradicating and controlling the wild life of streets (Winter, 2013) and setting aside vegetated areas as parks.

Historians are trying to reconstruct the complex origins of guidelines, unravelling the fascinating social and conflictual construction of the plainest technical rules. It is worth noting that green areas were initially meant as amenities or functional spaces, while environmental reserves and complex forms like the suburban green belt developed in parallel. An increased awareness of the benefits of parks arose from the opening of the private gardens of enlightened rulers or aristocrats: the first public park was established in Munich in 1792 (Brantz and Dümpelmann eds., 2011), and was followed by frequent commissions in other cities.

Since the beginning of the park movement in the 19th century, the provision of parks and playgrounds was seen as a clean, healthy and righteous alternative social space to city streets (Schmidt, 2008). One should not underestimate the circulation of these models; for instance, Olmsted and Eliot started the Boston Park system (the ‘Emerald Necklace’) during the late 19th century. It is noteworthy to remember, however, that Olmsted designed parks and parkways, as well as urban and suburban neighbourhoods, at the same time.

However, the two traditions of thought related to streets and parks have often crossed paths, and have been reframed, igniting new waves of policies and propelling the transfer of models (the “city beautiful” and the “garden city” being just two examples of the international circulation of models). The notion of ‘open space’ is in fact the offspring of this couple, whose ties seemed quite apparent until not long ago. The notion of the importance of open space likely dates back to the ‘Select committee on public trails in London’ (Turner, 1992) that arose in 1833 with a concern for “the exercise and amusement of the middle and humbler classes.”

In the modern planning movement, beginning with the garden city, and increasingly throughout the 20th century the street was considered a physical, social, and moral danger (Hall, 2014; Miller, 1990). In a very real sense, after the mass entry of motorized vehicles into cities in the 1920s, streets definitely became more dangerous, particularly for children. Howard, Frank Lloyd Wright, Le Corbusier and many others attempted to reconcile man, nature, and machine, either disguising development as nature or surrounding it by nature. The latter dissolved the city in a bucolic park occupying only 15 percent of the land (Fishman, 1991, pp. 163– 263), strongly advocating the abolition of urban streets, and the complete separation of pedestrian and vehicular movement.

The English and Italian cases offer some interesting parallels, having been reconstructed by historians, which might resonate with other national experiences. The first, interestingly designs a four step progress which somehow anticipates a general trend from quantitative to qualitative approaches (Maruani and Amit-Cohen, 2007). In particular, the London Plans (1929, 1943-44 and mostly that of 1976) have been landmark moments of change:

- An initial standard was proposed by Unwin building upon the patronizing attitude toward the lower class, which were supposed to adopt and benefit from the same healthy lifestyle of the nobility[1];
- During WW2, the Abercrombie plan fostered a more systematic approach introducing the notion of the network of open space, a reformulation of the green belt; standards were reduced[2], yet it introduced a concern for the unequal distribution of POS in different areas;
- Later, social scientists were involved in introducing a richer view of the qualitative dimensions of accessibility, appropriation and feelings though with scant practical effect (Turner, 2012; Burton and Veal, 1971).
- Finally, a typology of green areas replaced the POS standard since the mid-seventies, each one corresponding to a catchment area[3].

A negotiation between planning authorities and applicants will define the precise amount, location, type and design of green areas. However, the share depends on the number of dwellings or the extent of site (300 dwellings or 15 hectares being usually the threshold). The outcome will depend also on the specific characteristics of the site and its context. In contemporary development projects, a comparatively higher density of people will become rapidly incompatible with the standard, although it is often recommended by policy guidelines.

In the Italian case, the fascist government introduced a modern planning law in 1942, and standards were introduced after WW2. Similarly to the French case, the state was bound to provide for open space and public buildings, but no standard was introduced. Only in 1967, a national law mandated each local plan to ensure that a certain amount of land was made available for public use. The original concerns derive from an unusual actor: it laid in the social concerns and political demands promoted by the early women movement in the 1950s (Renzoni, 2014).

Standards were thus conceived as direct obligations of municipalities to set land aside for public use, being the minimum ratio between the space allocated to facilities of public and social interest, and the sum of zoned uses (residential, production, etc.). They were meant to provide for green areas and for other public services, notably schools, parking lots and social services[4].

The norm entitles each perspective inhabitant to a minimum of 9 sq.m. of green areas, and as much for all the rest (18 sq.m. per capita in total), that the municipal plan must provide. In theory, that land should be in the same planning zone, and should be acquired by the city in the immediate period following the approval of the plan, which recently has been limited to five years.

A similar standard has been later introduced in Spain too (Càceres 2003). However the law does not bound the state to a fixed standard, as in France (Aja 1997), though the local plans can introduce quantitative prescriptions. The government aims at providing 10 sq.m. of gardens and parks per inhabitant., sporting facilities or forests being included in a second target of 25 sq.m. per capita.

In a slightly different way, the German city of Hamburg determines the provision of green areas and parks as a ratio which is derived from global directives, landscape programmes, or local assessments. Eventually, requirements per capita come down to 6 sq.m. of green areas in close proximity to dwellings (up to 500 m. walking distance), plus 7 sq.m. of principal parkland (13 sq.m. in total).

All of these design guidelines, through the various subsequent reformulations, seem inadequate to cover increasingly varied development models. In fact, they roughly converge in quantitative terms only in the case of medium density of between 100-150 inhabitants/hectare. Applying the two models, either preserving 10-15% of green areas or calculating 10-15 sq.m. per capita, we get more or less the same results (Table 1) in cities with a density of about 140-150 inhabitant/ha (the case of Manhattan). For lower

[1] As early as 1925, the National Playing Field Association , delving upon contemporary literature on US cities (Turner, 1992). Later in 1929, Raymond Unwin reused it for the Greater London Planning Committee, which eventually implied an earlier formulation of the Green Belt. The resulting standard postulates 7 acres of open space for 1000 people (28 sq.m. per capita), mostly being private, and ¼ POS (7 sq.m.) (Turner, 1992).

[2] Approximately, 16 sq.m. per capita (4 acres of open space per 1000 population).

[3] A regional park of 400 ha is thus suggested for an area of a radius of 8 km (the size of metropolis); a district park of 60 ha for an area of a radius of 3.2 km of (the size of a city); and so on.

[4] In particular, the minimum standard of public space included 9 sq.m./p of gardens and parks, 2.5 of parking lots, 4.5 for schools and 2 for general equipment.

density (cities like Hamburg or London, for instance) or higher density (Paris or Hong Kong) standards tend to diverge and produce incompatible results.

Density inhab./ ha	Standards 13% of Land Outcome in sq.m./per capita*	9 sq.m. per capita Outcome in % POS of total.
25	52	2
50	26	5
100	13	9
150	9	14
200	7	18
250	5	23

Table 1: Density and standards

Density is thus the crucial cleavage in applying POS standards. In recent years, despite the growing awareness of the importance of city streets to the liveability of urban environments, the research on public health and urban planning still tends to highlight the importance of public parks and gardens for health and well-being (Barton, 2009; Fan et al., 2011; Serag El Din et al., 2013). Thus there is still a conflict between those who advocate for more green open space, and those that advocate for more lively urban public space (Hebbert, 2008). Even more so, the issue of urban POS per capita remains controversial either from a normative or a technical approach. An often quoted WHO standard suggest a minimum of 9 sq.m. of green open space per capita. Developed countries tend to adopt a much higher standard of 20 sq.m. per capita. Of late, environmental experts fostering the balance between carbon dioxide with oxygen production suggested raising the standard to 40 sq.m. of urban green space in high quality and 140 sq.m. suburban forest area per capita or about 50% of a neighbourhoods surface area, but this includes both public and private areas (Szulczewska et al., 2014).

3 PUBLIC OPEN SPACE IN CODES AND GUIDELINES

In POS, public means that all these spaces can be used for individual and collective purposes by respecting a set of codes, which are both cultural and regulatory. Codes however are publicly debated and publicly enforced rules. Often, such complex codes are a better guaranty of open and free use than the mere condition of being a public property. The worldwide spread of quantitative standards has been justified for their clarity as a measuring tools and their easiness of implementation (Gold, 1973; Hill and Alterman, 1977).

A national system of planning regulates POS according to different dimensions, namely a normative, technical and regulatory dimension. Two ideal types are shown in Table 1. The first ideal type conceives POS as spatial objects; whose ideal distribution depends on a catchment area defined by pedestrian mobility; and practically negotiated with developers. The second ideal type conceives POS as legal attributes; whose size depends on the number of present or future users, with only secondary attention to spatial positioning; and is enforced by a central agency in control of local authorities. Even if many combinations are possible, the British and Italian planning systems can epitomise the two types (Table 2).

	Type A	Type B
Normative	Performative: The dimensions and quality of working POS units (parks, gardens, small open space)	Legal: Individual needs or a collective right to POS
Technical	Scalar: A typology of POS units made to fit the geographical scale	Linear: A quantitative requirement per capita, sometimes articulated in functional subsets
Regulatory	Discretionary: The control is meant to regulate markets, and directed towards private developers	Mandatory: The control is meant to regulate government, and directed towards lower tiers of governments

Table 2: POS in Planning systems

The normative level designates POS and prescribes how to recognise and name them. The English case interestingly classifies different objects, i.e. parks or streets, according to specific sets of qualities, extension being just the first; this is an apparent culture led activities, where different cultures of planning or sensibilities are likely to emerge across time or countries; not surprisingly, cultural attitudes towards planned objects are subject to revisions, and change has in effect occurred several times. For instance, the London Plan classifies parks according to width and geographical scale (Regional, Metropolitan, district or local); and green area according to size and form (Small Open Spaces, Pocket Parks, Linear Open Spaces). In the Italian system, on the contrary, no previous definition of POS is provided, the discussion is being left to evolve according to changing sensibility (particularly apparent at a local scale).

Eventually, normative assumptions lead to technical statements. These are typical planning tools linking land to people through either binding or indicative relations. However, planners deal with POS in many different ways, the main difference being whether their technical estimation is based upon the aggregate appraisal of urban space (a share of total surface); or the requirements (or rights) of individuals. Planning relates these objects to the actual or future population, indicating a ratio according to either quantitative or qualitative threshold; these normative statements vary enormously, depending in part on asserted policies, in part on discretionary arrangements between actors.

Finally, as far as regulation is concerned, planning law and codes can make stronger or weaker obligations to which either public or private actors have to comply. These obligations depend on the style of regulation, the administrative language and multilevel negotiations among layers of government. These technical approaches reflect divergent political concerns and policy origins. It is not difficult to impute to the English case a concern with the control of land, the dysfunctionality of the markets, and thus economic values and developers' options. On the contrary, it is possible in the Italian case to retrieve an assessment of human needs, resulting from a political claim for a basic right, and the aim of controlling the population at the same time, and reducing local governments' freedom of decision in the second case.

4 WHAT THE STANDARDS DO TO THE CITY?

So if access to public and open space is important, the question remains: how much open space? The response, historically, has been to establish minimum standards of POS per person, in a similar way to the space standards imposed on residential buildings in order to insure reasonable living standards. However, these standards vary widely from place to place. The influential World Health Organization (WHO) recommends a minimum of 9 sq.m. of green space per capita, and that all residents live within a 15 minute walk to a green space (UN-Habitat, 2015a). This space allocation has to be added up to the allocation for public services (such as schools, kindergartens etc.) and the necessary streets to allow for access to buildings. The application of this standard, puts practical limits on the gross density of urban development, if it is applied equally across all neighborhoods of the city (Figure 1). This is because as the density increases, the percent required for public land use exceeds 60%, which means that net density rises, limiting the building typology to high-rise building (Alexander, 1993).

There is much research on the importance of urban density for city economic and social liveability (De Nadai et al., 2016; J. M. Jacobs, 1961), transportation sustainability (Ewing & Cervero, 2010; Kenworthy & Newman, 1999), and not least the overall expansion of cities over arable and useful land (Angel, Parent, Civco, & Blei, 2011). One can see from the graph in figure 1, that different open space standards have significant impact on the feasibility of urban density, and on the urban fabric itself. With a 9 sq.m. per person standard, it is not feasible to build at a density higher than about 105 dwelling units to the hectare. While a standard of 3 sq.m. to the hectare will allow a density reaching 200 units to the hectare.

The consequences of high POS standards are that they limit our ability to reach high urban densities with low and mid-rise buildings and force us to build either high rise buildings or at a mid-low density. Both of these typologies make it difficult to create walkable, vibrant cities. Public transport is also less viable, and urban sprawl and automobile dependence are increased. Low densities also make it harder to create mixed use areas. Therefore, existing POS standards contribute to sprawl and diminish the sustainability of urban areas.

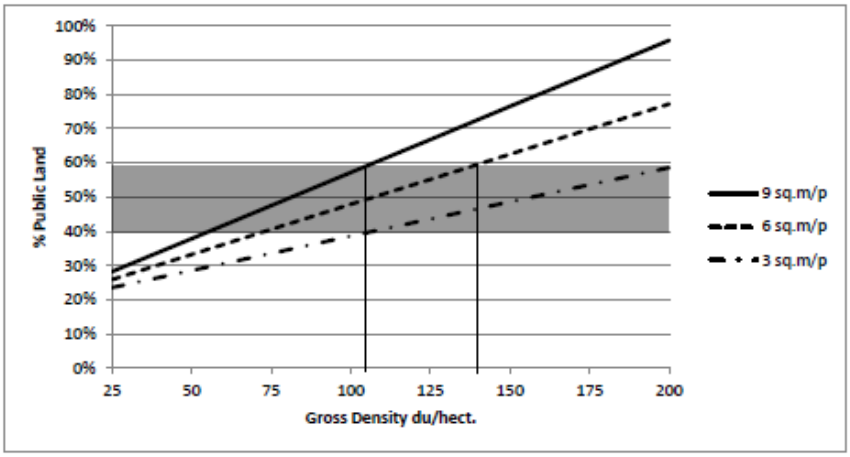

Figure 1– The relationship between Gross density and public land using different sq.m./p standards

The calculations assume: a neighbourhood development of 10,000 units and a mean household size of 3.1 persons/hh. The street area is progressively calculated from 20% at the lowest density to 30% at the highest.

4.1 SOME OTHER PROBLEMS WITH PUBLIC OPEN SPACES

Moreover, in research comparing POS quality and use in neighbourhoods in Israel (Feierstein & Rofe, 2010; Rofè, Zarchin, & Feierstein, 2012), we found that in lower density neighbourhoods, there was over provision of public space, because the regulations for the accessibility to POS, and their minimum size, were governing the size and location of POS. Thus, neighbourhoods already enjoying a large allocation of private open space, were also enjoying POS allocation that reached between 15-30 sq.m. per person. Furthermore, our study showed that the green POS in the neighbourhoods were used much less than civic POS, located close to commercial and service areas. POS were mostly used by adults accompanying toddlers to playgrounds, and even children stop using them when they begin to go out into the neighbourhood on their own. Finally, in a survey of neighbourhood residents we found that spending time in the neighbourhood park is the activity less enjoyed outdoors, relative to walking along the neighbourhood's streets, which was the second preferred activity after sitting in one's own private open space.

5 A NEW FLEXIBLE STANDARD INCLUDING STREETS

It seems that the standards cause an inflation of POS. A comparison between areas of traditional urbanism (Nice), modern urban planning (Ashdod in Israel), New Urbanism (Poundbury, UK) and contemporary informal housing area (Santo Amaro in Recife, Brazil) has shown that while traditional and informal urbanism have a rate of 4-5 sq.m. of public space per person, modern urbanism has four times as much at about 19 sq.m./person, and the new-urban development an incredible 65 sq.m/person (Schocken & Ludermir Bernardino, n.d.). This is similar to findings with regard to distance between major streets (Porta, Romice, Maxwell, Russell, & Baird, 2014). In both cases these are the results of modern planning standards that are still mandated. We seem to be at a conundrum. POS are important for health and well-being, as well as the environmental functioning of the city, but it seems that when they are mandated, they are actually over-supplied, little used, and become a burden on the community's resources.

The reason for the conundrum, is that we have become oblivious to the major resource of POS in the city. Even in modern planned cities, streets constitute the largest extent of public space. They are necessary, because they provide access to private property. We know that they are the place where most encounters occur in public space. But in order for encounters to happen, there has to be co-presence and awareness of each other in public space. Gehl and Gemzoe calculated that the average density in public space in Copenhagen remained roughly 12 sq.m./person (Gehl & Gemzoe, 2003), thus as space for pedestrian activity became available, more people came to use it. As we saw historic and informal cities have a POS to population ratio between 3-6 sq.m. per person (at the urban quarter level). Thus, in order to create lively

streets it seems that between a quarter and half of the population living in its vicinity needs to be outside in it at any one time, which seems a rather high number. In reality, we know also that most pedestrian movement occurs on major streets (Hillier, Penn, Hanson, Grajewski, & Xu, 1993; Jiang, 2009; Lerman, Rofè, & Omer, 2014), and that these main streets are also responsible for the majority of social and economical life of the city (Carmona, 2014). Boulevards and main streets function better as human spaces when more than 50%, and often about 70% of their section is felt to be a "pedestrian realm" – an area where pedestrians feel unthreatened by cars, even if cars are allowed within it (Allan B. Jacobs, Macdonald, & Rofe, 2003; Rofe, Yerushalmi, Margalith, & Windsor, 2015). This means that a large investment in streets is in order to make them functioning public space. But this investment will not be possible if that space is not considered as part of the needed provision of POS in an urban area, thus allowing a corresponding reduction in the amount of parks and gardens for which land needs to be allocated.

What would happen if we begin to actually take seriously the fact that streets are an important part of public space, and begin to count them as part of the space required by the POS standard? Provided, of course, that they are designed in such a way as to allow between 60-70% of street space to be pedestrian oriented and therefore potentially public space. Indeed, in the UN-Habitat, Global Public Space Toolkit (2015b), the first three principles are:

1. Adequate space for streets and an efficient street network (30% of land area)
2. High density (a minimum of 15,000 p/sq.km. which translates to 150 p/hect. or roughly 50 du/hect.)
3. Mixed land use (40% of the floor space for economic uses)

Thus, it is possible that 40-60% of the area of all streets will be designed and managed as a pedestrian realm. While in narrow and local streets the pedestrian realm occurs almost automatically, wide and major streets have to be designed as boulevards and green corridors (Bosselmann, Macdonald, & Kronemeyer, 1999; Mehaffy, Porta, Rofe, & Salingaros, 2010). This will result in natural traffic calming and therefore a reduction in number and severity of accidents, and the ability to meet the POS standards, without losing the possibility to achieve high density.

As can be seen in figure 2 below, taking into account the streets as part of the public space needed to satisfy the standard allows us to achieve even 15 sq.m per person while still arriving at a density of about 100 du/hect. (or about 300 people/hect.). At a standard of 3 sq.m. per person we can achieve a density of 200 du/hect. While still maintaining public land beneath 40% of the area of the development. Between these two extremes we can reach a diversity of allocations, according to the type of development required, and the urban context. Peripheral areas may have a larger ratio of public space per inhabitant, while central and dense areas may be planned to a lower space standard (but probably higher quality and complexity). Obviously, when applying the standard, one will have to make sure that the streets are indeed designed in such a way as to enable them to become a social space, and that will give the city, and developers an incentive to do so, because it will enable them to increase density, and to allocate less land to public uses, and more to private, income producing land.

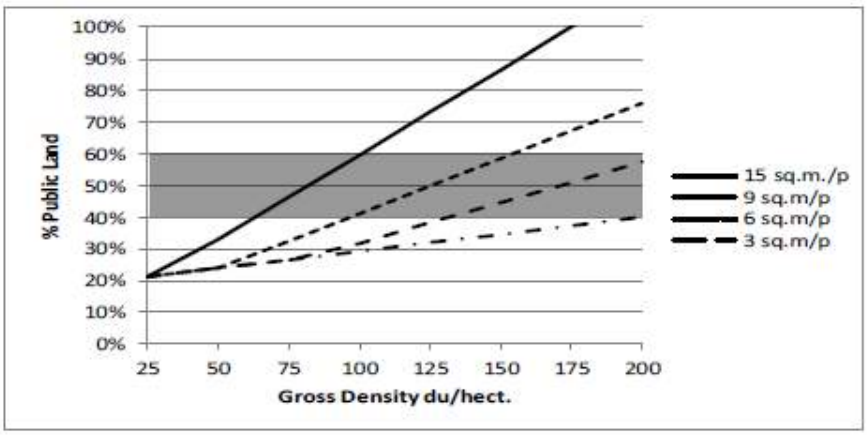

Figure 2– The relationship between Gross density and public land proposed standards taking into account streets as part of POS.

Indeed, as cities grow and consolidate they reduce the ratio of population to public land available, and transform the land from public open space to mostly streets. Thus the standard could be seen as capturing both the spatial change in cities from centre to periphery, as well as the temporal dimension of growth, densification and consolidation. An area that starts with 15 sq.m. per person or higher, as it grows, adds height to the buildings, and people to homes, it usually will not increase in the quantity of streets and public spaces it has – therefore the ratio of POS per person will become lower, and the density higher. Thus, this variable standard will allow once again cities to grow naturally, without attempting to add public space as they densify. Thus this system also merges the two regulations systems discussed above (Table 2). It allows for a variability in POS allocation per inhabitant, according to the context and cultural preferences, while maintaining the viability of the urban system as a whole by controlling the overall proportion allotted to public space.

6 CONCLUSION

A consensus position since the 19th century is that, of all the unbuilt parts, public open space (POS) is a fundamental component of a city. We remind readers that POS is the sum of two key components of the unbuilt part of a city: first, all kinds of streets and secondly green areas. Though early industrial developments heavily ignored environmental concerns for the sake of profit and control, green areas have been on the front stage of cultural debates due to their social and formal implications.

The need for open space has often been claimed for different reasons. In the modernist approach of the city as a 'living machine', built and unbuilt parts are disconnected: in the unbuilt side, streets were demoted to traffic corridors, in order to support increasing mobility. Car mobility in particular has led to dematerializing streets into the notion of networks, and confined them to the realm of engineering rather than place-making.

Parks have however resisted the reduction to functional machines. Most of the research has concentrated on the profound social and pedagogical implications of green areas. Only recently, parks have been reinvigorated by the international concern with public health, the environment and urban sustainability, and recently urban metabolism.

On the other hand, the metropolitan restructuring of cities leads to a re-conceptualisation of urban tools, like parks and streets. The new geographical scale changes also the appreciation of age old issues, in particular: the lack of natural space; density; and the role of networks in interconnecting both artificial and non-artificial spaces. Recently, green networks have been called upon to play an increasingly important role in fostering a sustainable model of urban development (we deal with the greening at the metropolitan scale in a forthcoming paper). Researchers and advocates call for increased allocations of green spaces in the city, not always distinguishing between the metropolitan scale – where the mean amount of POS per capita is often measured, and the standards based on these means that operate at the level of urban neighbourhood or project.

In parallel, there has been a re-evaluation of the importance of streets to urban public space (Gehl, 1987; Hebbert, 2005; Jacobs, Macdonald, & Rofè, 2003; Murrain, 2002). This has led to substantial changes in policy and guidelines. There are also signs that policy makers' attitudes are changing, as underlined by UN-Habitat director J. Clos in preparation of the recent Habitat III conference.

However, there seems to be still a disconnection between these two streams of thought, seeking to create an urbanism adequate to the challenges of the 21st century. We suggest that the time has come to reconsider streets as an essential part of the public space network that is needed to satisfy the policy standard for POS, and to unify the standards for both streets and public space provision. This move allows moderating the need for public land in new development, while providing for a diversity of allocations and density as well as dynamic change. Even more important, it requires designing streets as real social space, and adapting them to new urban and metropolitan contexts.

Does it mean that POS standards will change? The answer is no unless both the normative and regulative dimensions are taken into account. As shown by a recent body of comparative research, national planning systems are quite different from each other (European Commission, 1997; Newman and Herschel, 2002), reflecting national traditions and legal and political frameworks. Planning cultures are even more diverse,

and they interfere consistently with the normative side of planning (Sanyal, 2005). Structuring issues and circulating ideas (Healey and Upton, 2010) have been constantly part of an ongoing discussion between reformers and policy-makers. All planning systems have addressed the question of how much open space is required in a given situation: but the answer depends as much on the political side as on the technical one.

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ID 1693 | OILANDSCAPES. THE RECONVERSION OF FOSSIL FUELS MESHES AS “GREEN ENERGY BACKBONES” FOR THE TERRITORIAL RESTRUCTURING OF THE THIRD INDUSTRIAL REVOLUTION

Alberto Verde[1]; Alessandro Massarente[1]
[1]University of Ferrara, Department of Architecture
alberto.verde@unife.it ; alessandro.massarente@unife.it

ABSTRACT: Fossil fuels industry has always been carrier of huge spatial transformations: first of all, because the extraction of carbon-fossil resources requires the investment of huge amounts of funds to deploy a widespread infrastructural network, and secondly, because the associated industrialization process deeply contributed in the definition of new urban morphologies and settlements. We could affirm that fossil fuels and industrial revolutions represent two sides of the same coin. Since the end of XVIII century, the two industrial revolutions have been dominated by a fossil fuels’ monopoly in terms of energetic production, firstly driven by coal-based activities and later by oil. As already known, hydrocarbon resources are not equally and democratically distributed in the subsoil, and this has created over the centuries some vertical dependences between fossil fuels suppliers and consumers, which completely redefined the geo-political equilibrium among countries. One of the most remarkable effects of this unbalanced distribution of fossil resources in the subsoil had been, especially during the first industrial revolution, the territorial attractiveness of hydrocarbon-rich territories for the settlement of huge heavy industry sites. The consequent high concentration of employment reshaped the territorial hierarchies among population, countryside, urban areas and infrastructures. The aim of the first part of the paper is to investigate about the role that fossil fuels industry played in the definition of territorial hierarchies during the first and the second industrial revolutions. The analysis will be led through a comparative study of some GIS cartographies of two renowned European territories: the “Ruhr region” and the “central Veneto region”. In the second part of the paper, we will focus in a more proactive way on the “oil mesh of the North-Eastern Po valley” and wonder about how fossil fuels infrastructures could be “deengineered”, albeit maintaining their energy production identity, and imagined as “green infrastructures”, so becoming those landscape articulators which can foster the dialogue across territorial, urban and architectural scales thanks to their new socio-ecological role. The “scenario building” (Viganò, 2012 and Sijmons, 2014) will root its beliefs, assumptions and constraints around the vision of the “energetic transition towards the third industrial revolution” which, as advocated by the American economist J. Rifkin (2011), envisages a massive shift towards new renewable and territorially distributed forms of energy production.