The Hidden Designer: Rethinking Urban Rules in City Making

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THE HIDDEN DESIGNER: RETHINKING URBAN RULES IN CITY MAKING

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ABSTRACT

Urban rules have been used for centuries to control the interaction between actors involved in city-making and its translation into the built environment (Lehnerer, 2009). They are a stratified legacy that, especially from the Industrial Revolution, were overshadowed by the need for urban planning.
On the counter stream, we are witnessing new tendencies: in a time in which European cities have to deal with progressive modifications rather than massive expansions is arising the role of design tools meant to transform the existing city.
This paper builds on the analysis of the making of the ordinary urban fabric – the city intended as the combined result of spatial planning, market forces, swinging frames of reasoning, conformity to norms and individual expectations and aspirations. On this basis, this paper focuses on the role of urban codes in shaping the structure of our cities. Specifically, it aims at exploring the intertwined connection between urban codes and city morphology. Commonly urban codes are intended as a set of rules that regard singled out 'elemental types' (such as height, roofing, windows, and the like) and their relations within the built environment with no correspondence to a predetermined and unique location. In that, urban codes profoundly differ from plans, even if they both impact on the urban configuration.
Urban codes are usually associated with different scales, from building elements to street layouts intended to promote desired urban forms.
Rethinking urban codes, shifting from a post evaluation perspective to a design-oriented one, calls for the intervention of architects. This paper explores this approach through the case study of Turin, Italy, within the on-going revision of the urban regulatory system promoted by their City Council.

KEYWORDS

Urban design; urban rules; urban codes; urban morphology.

INTRODUCTION[2]

The development of the set of rules that has determined the forms and uses of the European city, from the modern age to today, reflects the succession of priorities and paradigms: industrial expansion, reconstruction and urban growth, environmental protection and emergencies, functional and physical transformation of buildings. While the Italian debate has focused on planning tools and their effectiveness in responding to the socio-economic challenges of cities (Secchi, 2000; Mazza, 2002), accessory regulations seem of less importance. For example

[1] The autorship of this article is equally shared by Caterina Barioglio, Daniele Campobenedetto and Marianna Nigra. Lucia Baima collaborated to the analysis and proposals concerning the "roof" element.
[2] This article is an aoutcome of the Re-coding Research project, developed as part of the collaboration agreement between the City of Turin and the Polytechnic of Turin for studies and research related to the preliminary investigation activities for the general revision of the PRG This document is the result of the research work of the Department of Architecture and Design (DAD) carried out at the Future Urban Legacy Lab (FULL) interdepartmental center. Principal Investigator: Matteo Robiglio. Coordination: Caterina Barioglio; Daniele Campobenedetto; Marianna Nigra. Research Group: Lucia Baima; Michele Barale; Caterina Barioglio; Daniele Campobenedetto; Francesca Frassoldati; Valerio Roberto Maria Lo Verso; Maddalena Martina; Guglielmina Mutani; Marianna Nigra; Anna Pellegrino; Matteo Robiglio; Riccardo Ronzani; Valeria Todeschi.

building regulations which, according to a hierarchical order specific to zoning, often had the task of intervening after the definition of the use of land was set. This division of roles, understandable in a condition of urban expansion and city development guided and accompanied by public investment, has been gradually put into crisis by the transformation processes in the existing city.
This dimension is generically defined by the term coding, and is considered as a specific and complementary dimension to the intended use of land, mainly based on a system of laws and rules of conduct in a designated context, written by specialists but intended to be transmitted and communicated without interpretative doubts, with a sufficiently general and repeatable character. Without entering into the architectural choices, confronting the coding tools means confronting the set of rules concerning identified elements (height of the buildings, roofing, openings, relations between elements of the same or of different buildings and the like) and their relations with the built environment, but which do not refer to specific areas of the city.
Seaside's example shows how coding can operate as a set of complementary tools, not just under-ordered to planning. Taylor (1998) states that, in the course of spatial planning theory (in the conception of physical design of the city), a clear distinction has never been codified with respect to the architectural and urban design. It was only after the 1960s that this conception questioned. Coding for these reasons, which is articulated between plans and regulations (as often happens) or which is clearly identified by specific tools (as in the case of Seaside), is the preferred tool for the management of ordinary transformations, in practice and as potential field of elaboration and innovation.
It is Eran Ben-Joseph (2005) who emphasizes the role of coding urban rules, in particular through the definition of standards as a specific element that establishes the minimum characteristics of the built environment, both in terms of quantity and in terms of quality. Coding therefore constitutes a liminal field between ordinary transformation of the city and formation / redefinition of the urban layout (a necessarily extraordinary operation given the exceptional nature with which it presents itself with respect to the history of a city).
The codes are in this field because they allow the coexistence of different instances within the urban fabric and at the same time have effects on the shape of the city.

1. CODING MATTERS

In an era in which cities in Italy, as well as in the Western world, face progressive transformations rather than large expansions, the design tools aimed at transforming the existing city are becoming increasingly important. Over the past thirty years in Italy, some laws have been promulgated at national and regional level to encourage reuse practices in the city, in particular by facilitating changes of intended use, volumetric additions to existing buildings and use of unused spaces.[3]
Over the past ten years, the value of urban codes has been highlighted as an important tool for controlling the shape and transformation processes of the urban fabric (Talen, 2012; Ben-joseph, 2005; Marshall, 2011).
A significant example is the renewed interest in form-based codes, which act on types, standards, elements of architecture and more generally on physical form - rather than the separation of uses - as an organizational principle of urban space. The form-based

[3] The law No. 106 of 12 July 2011 has as its objective the rationalization of this heritage - through incentives in volume and simplification of the procedures for changing the intended use - acting in fact directly on the settlements, independently from the Regulatory Plan. The regional law (Piedmont) n. 16 of 4 October 2018 establishes the morphological characteristics for the recovery of spaces for residential purposes, in particular of attic rooms, admitting functions already established in the PRG.

codes are not guidelines but constitute real regulatory tools, which are integrated into the local regulatory system. In order to make the prescriptions, rules and standards of these codes accessible and communicable, they are presented both in textual language and in graphic form. A significant case is the code that The City of Cincinnati approved in 2013, awarded the title of Grand Prize for Best Planning Tool or Process at the thirteenth Congress for the New Urbanism in Buffalo in 2014. The code applied to the entire city attributes for each type of building fabric a series of specific morphological rules, with the aim of strengthening the character of a place and regulating the uses in relation to the shape of the built space. these codes are presented both in textual language and in graphic form.

Other initiatives are evidence of a growing attention towards coding which translates into experiences of various kinds. One of these concerns the drafting of illustrated manuals of urban rules, among which the New York case stands out. Since 1961 the city of New York has developed a practical manual that describes the rules contained in the pages of the zoning resolution. In the latest editions (2011-2018), the manual is also intended for a wide audience of non-experts and has the aim of spreading the understanding of urban rules. The simplified description of a part of the rules that act on the morphology of the built in New York allows citizens to become more aware of the regulatory system, promoting democratic debate around the transformation of the city and free initiative.

A second group of experiences concerns the development of new laws to encourage the reuse of existing spaces. The work from the cityLAB of the University College of Los Angeles, for example, led to drafting laws to encourage the construction of additional housing units (backyard homes, secondary units, garage apartments) within already partially occupied lots. To these experiences promoted by public subjects, systems are added that allow to automatically calculate the morphology made possible by the standard, while offering an automatic verification of compliance with the urban rules of preliminary projects[4]. These are mainly services developed by private entities and included in the market, especially in contexts characterized by an intense activity of transformation of buildings.

2. TURIN AS A CASE STUDY

Coding, applied to the Turin case, has some peculiarities that need to be retraced.

The first concern with the transformation models on which the Turin regulatory plan was conceived. Approved in 1995 and developed over the previous decade, the PRG was conceived in a period of profound change in the economy and geographies of the city (Bagnasco 1986, 1990).

The regulatory plan of Gregotti and Cagnardi is the result of an interpretation of this framework: it is a plan of reuse of the city, based on transformation rather than expansion, and which looks at the potential of the areas that were going to be disposed of, thus like the spaces occupied by the great infrastructures of the twentieth century.

By relying on the possibility of large public and private investments, still available despite the industrial crisis, the reuse of the city presupposes an intervention for large sectors of transformation.

However, some questions emerge from the study of the set of urban codes of the City of Turin.

The regulations are born above all as a response to specific problems: even more than plans, they are built for successive stratifications of technical requests, successive additions, replacements and progressive integrations.

[4]Tools such as Xkool in Shenzhen, or even Envelope in New York enter the market to provide designers with automatic tools with preliminary assessments of compliance with urban rules, especially morphological ones.

Just as in the second half of the nineteenth century the health problems created by mass urbanization gave rise to hygiene regulations, so in the fifties of the twentieth century following the immigration from the regions of Southern Italy to Turin control tools were needed for the illegal sale of canned products; or again, with the spread of analog and then satellite television, it is necessary to check the installation of the antennas.
In recent decades in Turin, some international events and socio-economic changes (including the winter Olympic games, the rediscovery of the historic center, the temporary reuse of spaces) have contributed to the further - not always coherent - stratification of the regulatory schedule.
The complexity of the regulatory system (Moroni 2015) thus structured makes it difficult to understand a priori its possible effects on the built space. This difficulty is not limited to reading the relationship between rules and cities, but is also an obstacle to the use of the regulatory system as a design tool.
In parallel to these issues, the current form of the regulatory system is questioned with the emergence of some global emergent issues.
The environmental emerging issues need to be addressed, not only through specific rules, for example regarding energy performance, but in an integrated way. Acoustics, water treatment, energy performance are increasingly considered by international urban regulations as interdependent aspects and intertwined with other urban standards, rather than as separate regulatory objects.
The change in housing demand, the expansion of e-commerce services and logistics platforms, the digital revolution, among others, have changed the ways of using the spaces of the city and the values - not only economic - that are attributed to these spaces .
The transformation of production systems and emerging forms of work contributes to a process, change tendencies compared to the recent past of reintegration and fragmentation of production activities within the urban fabric. Although these issues are subject to regional and national laws, they can no longer be addressed only through implementation in the plans that govern large sectors of transformation.

3. A METHOD TO EXPLORE URBAN RULES: FROM BUILDING ELEMENTS TO REGULATIONS AND VICEVERSA

Within this context, both on a European scale and on a local scale in Turin, the research project *Re-coding*, reconsiders the codes not only concerning their design, but above all as a way of rethinking the principles that have made the fortune of zoning: a city of incompatible industries and uses whose critical contiguities should be regulated, regulated by specific sectoral regulations aimed at listing in detail prescriptions and exclude undesirable occurrences. The unwanted results that derive from it, the sum of single uncoordinated objectives, entails new difficulties when it comes mainly to regulating the transformation of existing cities.
Such work is organized in two ways:
- from control tools (litigation, image, hygiene conditions) to project tools;
- from tools for city management to tools designed for the transformation of the city.
If the paradigm shift of the 1960s went from a morphological conception of the city to the idea of ever-changing flows and activities (Taylor 1998: 159), the Re-coding project wants to reiterate the link between urban transformations and the codification of the morphological dimension of the city.
The Re-coding project therefore investigates the ordinary transformations of the urban fabric, the combined result of spatial planning, market forces, as well as the compliance with standards and individual expectations

and aspirations. Re-Coding explores the role of urban codes in shaping the structure of cities, through the relationship between rules, morphology and uses of buildings, and aims to provide tools for restructuring the system of rules in support of a paradigm shift from "city of the new" to the "city of reuse".

The aim of the Re-coding project is to explore the concepts of simplicity, clarity and ease of use of the system of rules that regulate space (Moroni 2018), not only to facilitate accessibility and the democratic debate around the rules, but also to stimulate the activities of urban transformation and activating widespread projects. Furthermore, by analyzing the forms and by relying on data spatialization and dynamic visualization tools, the project aim is to foresee the spatial effects of the rules on the built environment.

By working on urban codes, the Re-coding project aims is to strengthen its potential as a design tool, and to read ordinary transformations in a systematic way on a city scale.

Specifically, the main objective of the project in relation to the regulatory system is to seek simplicity. The project aims is also to respond to the growing complexification of the city - reuse of spaces, fragmentation of the use of resources - not through the complexification of the regulatory system, rather through its simplification. Such simplicity could be achieved as follow:

- Accessibility of the regulatory system by citizens, investors and professionals, even outside the national system, through legible and understandable rules. The intelligibility of regulatory tools makes the rules questionable by a wide range of social actors.
- Clarity of the regulatory system, i.e. promoting understanding of the effects of a rule in all cases where it can be applied.

To carry out this integration, the Re-coding project relies on three actions:

- Reorganization: the city of Turin uses different types of regulations, with different areas of application, different degrees of updating and overlapping. The Re-Coding project proposes the reorganization and rationalization of the regulations, starting from the rules that act on the urban space, and the graphic representation of the morphological rules.
- Disambiguation: in order to provide the city with a tool for managing ordinary transformations, the Re-Coding project proposes to collect and reorganize the morphological rules currently present in plans and regulations. In particular, it is proposed to eliminate ambiguities in fields where the morphological rules contained in plans and regulations overlap.
- Revision of the rules by "elements": The revision of the rules regarding identified elements of the city (height of the fronts, window, roof, envelope) aims to modify a control instrument into a project instrument, to unlock the potential of ordinary transformations .

The actions on the regulations thus described are carried out through a method that moves on a double track.

the first track instead starts from the containers of the rules (the regulations), to explore the environments in which they act and the objects they regulate.

The incremental growth of the city's regulatory systems (not only with regard to the management of the urban space) and the difficulty of continuously maintaining the regulatory system can generate overlaps and conflicts. This consequently not only results in a regulatory system that is difficult for citizens to use, but can also generate disputes in which the responsible public entity is called upon to respond in the legal seat.

To address such problem, this study proposes an investigation of the regulatory instruments according to four categories with the aim of eliminating ambiguities and reorganizing and the set of regulations:

1. The area of application of the regulation, which describes the spatial field in which the

rule operates. The regulations can refer to an urban area or to a specific building, or concern the entire municipal area.
2. The relationship with the physical space of the city, which describes the action of the space regulation or its dependence on spatial parameters.
3. The functions regulated, in spatial, managerial, or procedural terms by the regulation.
4. The elements regulated by the individual regulations.
The second track consists of an analysis of identified "elements" and the rules that, regardless of the regulation in which they are contained, act on them. By "elements" we mean both the components of the building system - for example the roof or the openings of the enclosure - and the parameters that define the characteristics of the internal space - such as the size of the rooms, the minimum heights, the surface of the minimum real estate unit - and urban form - for example the land index, the coverage ratio, the settlement density (Talen, 2012; Alfasi, 2018; Marshall, 2011). For each element we have identified the rules that act on it, the level (municipal, regional, national) to which these rules refer and some internationally comparable case studies. In this study, the elements are divided into progressive scales (the city and the building, the building - internal spaces, construction systems, environmental control systems) and can be repeated at different scales. This ontology of the elements of the urban space has the aim of forming a tool for the public administration that can be useful to guide the analysis, the reorganization, the disambiguation and the revision of the urban rules, as well as the evaluation of the social, economic and of these possible actions. Furthermore, the division into elements constitutes a possible interface of the urban space regulation system to facilitate its consultation by the subjects involved in the transformation processes (citizens in the first place). A classification of rules built on the basis of elements can thus provide not only a structure for analysis, but also a tool that puts them in hierarchy and communicates them clearly to the actors of transformations.

4. CODING RULES AS TOOLS TO FACE THE TRANSFORMATION OF THE EXISTING CITY

As part of the revision of the City Masterplan of the city of Turin, three issues were addressed regarding the transformation of the built environment, for which urban rules and in particular the rules of Coding seem to be critical. Studies were carried out on topics identified as relevant and actions were proposed for each issue, according to the objectives described in paragraph 4, on the regulatory system of the City of Turin.

4.1. The relation between Coding e Zoning

Following the first of the methodological rails described in the previous paragraph, the first issue addressed is the relationship between Coding and Zoning, which, if not clearly identified in the city's regulatory system, can constitute an obstacle to the application and clarity of communication of the rules.
In this context, a first study was carried out regarding the organization of urban regulations. The city of Turin has 176 regulations. As a result of a regulatory stratification and subsequent revisions over time, these regulations are very different from each other in terms of scope, specificity, purposes and degree of updating. Despite this, due to their legal nature, they are presented by municipal communication systems in a non-hierarchical and non-themed way.
This analysis was subsequently translated into a proposal for the reorganization of the rules within the regulatory objects that contain them, in particular through the hierarchy of the

regulations by merging them according to the functions or regulated elements.
A second particular study concerned the overlapping of the rules in the Coding and Zoning tools.
The Turin PRG assigns specific areas of the city of the quantities (in particular the land index) and the permitted interventions. Zones contain further subdivisions for admitted functions to which morphological rules are assigned: this involves a direct link between the admitted function and the morphology foreseen by the plan. With this structure, the PRG establishes a direct dependence of the morphological rules on the admitted functions. This entails an overabundance of different morphological rules in areas of the city where numerous functions are allowed, even if the typology of urban fabric is uniform and recognizable. In such situations the morphological rules are not consistent with the type of urban fabric.
From this study a disambiguation proposal was envisioned, which suggests the absorption of the regulations referring to a specific area of the city within the City Masterplan and the transfer of the morphological rules for the whole city within the building regulation, leaving the Plan the identification of particular rules for specific areas.

4.2. The environmental issue

The second issue addressed concerns the effects of the rules relating to the urban dimension of buildings (their public dimension, their envelope and their shape) and is explored through the analysis of the elements of the built environment.
The Energy Regulation Annex of the City of Turin regarding is being revised in order to update it and to include wider environmental aspects: the adaptation of the city to climate change, the mitigation of heat islands, the improvement of thermo-hygrometric well-being and air quality, the improvement of the usability of public spaces and the incentive for sustainable behaviors.
In this context, two particular studies were addressed that deal with the environmental issue through the analysis of the rules that act on two elements of the building envelope: the "window" and the "roof".

4.3. The living space

Lastly, the third issue addressed concerns with the effects of the rules relating to the interior spaces of buildings, which affect the ways in which spaces are inhabited.
The diffusion of new social and economic dynamics ways of living the urban space questions the usability of the residential heritage existing in contemporary cities, and call for reconsidering the relationship between emerging needs and built space.
Part of the current population living in Turin today expresses a demand for housing for social gatherings other than the traditional family (such as students or young workers, temporary or away workers, tourists). At the same time the Savoy city, like other European cities whose urban fabric is the result of a progressive stratification and densification hosts a real estate heritage produced by necessities, now outdated, expressed in past historical moments.
This translates into a poor response to the demand from the existing real estate, which results into a high number of vacant housing (over one in ten according to a 2018 study by the Observatory of the Housing Condition) which, however, could be adapted to respond to new needs.
To these are added unused or underutilized spaces that could be transformed for residential purposes. Attics, basements, garages, low buildings inside the courtyard, storage or work warehouses, solariums or other structures positioned on the roofs, illuminated stairways, caretakers' stations are some examples of "potential" living spaces.

There are also other "accessory" spaces - such as disused technical volumes, interstitial spaces or resulting areas - which, although they are not easily convertible into living spaces, can be rethought to increase the intensity of use of urban spaces; they can host, for example, temporary uses, domestic laboratories, vegetable gardens and gardens, activities for collective use indoors or outdoors.
To address these issues, an analysis of the rules is underway - in particular with regard to the minimum unit, the spaces that are rarely used and the accessory spaces - to stimulate the debate on the theme of living in institutional offices and to suggest tools both for returning to the market for stranded goods, both for the activation of the potential of spaces that are still little considered in the real estate market today.

CONCLUSION

European cities are the product of a stratification of norms and rules. As contemporary interventions have to deal with pre-existing buildings and urban layouts created for ceased purposes, they have to deal with pre-existing systems of rules too. Rethinking urban codes have been proved to be a key element for a strategic approach to the transformation of the contemporary European urban environment.
Within this frame, the role of the architect becomes as relevant as the one of urban planner in the conception of urban rules that can be a design tool for the city. Thus, urban rules can be considered as a "hidden designer" acting together with architects and planners.
Through the reorganization of the regulations – which are very stratified and complex in the case of Turin - efforts are made to increase their accessibility and usability, as well as to allow a large number of actors to act on urban transformations.
In addition to the reorganization of the containers of the rules (i.e. the regulations), the disambiguation actions and the revision of the rules by elements also allow to act on the contents of the individual rules favoring their real time verification during the design process.
The inclusion of environmental issues within urban and non-segregated regulations in dedicated and thematic documents allows full integration with those urban rules that guide the design and transformation processes at the scale of the building and the city.
Moreover, the role of the architect in revising urban rules can also both stimulate the debate and encourage best practices for adaptive reuse (Robiglio, 2017) of urban space.
Consequentially, studies on contemporary living allow us to suggest tools both for the return to the market of "stranded" goods, and for the activation of the potential of underused spaces that are still under played in the real estate market today.
Finally, besides considering the transformative power of the regulation system, we can interpret the regulative potential of architectural projects, and thus of the role of the architectural designer. Designers agency can challenge and stress the regulatory system, eventually resulting in a change of rules.

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