

Sustainability and Urban Morphology: an Underrated Relationship

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Abstract

The urban sprawl that took place in European cities after the end of World War II produced a remarkable waste of land and an increase in social costs due to the proliferation of public infrastructure. To curb this phenomenon, it behooves us to re-examine the notion of urban morphology, particularly as regards old districts: with their intrinsic compactness and ever-recognizable form, they offer a lesson in economy and rationality and can enrich the debated concept of sustainability. A case study—a personal project stemming from a professional assignment—provides new hints regarding the relationship between sustainability and urban morphology.

Keywords: Sustainability, Urban Morphology, Urban Green, Urban Fabric, Compact City, Meta-project

Introduction

The notion of urban morphology seems to have been somewhat neglected in the context of the contemporary debate on sustainability, which is nowadays mostly related to construction systems or technological devices. Nevertheless, this notion is based on an authoritative tradition of studies that started with some pioneering works by European historians between the 19th and the 20th centuries, and later became the focus of attention in Italian academic research, between the Sixties and the Seventies, thanks to many theoretical contributions by architects such as Saverio Muratori, Paolo Maretto, Gianfranco Caniggia, and Gian Luigi Maffei, as well as Carlo Aymonino and Aldo Rossi. This tradition of studies is now represented by other authoritative scholars (Conzen, M.R.G. 2004; Oliveira, ed. 2019, Strappa, Carlotti, Camiz 2016). The usefulness of a notion like urban morphology is evident on many levels. Firstly, it allows us to clearly decipher cities, by spotlighting full and empty spaces alike: ordinary buildings and monuments on one hand; streets and squares, as well as parks and gardens, on the other. Additionally, urban morphology maintains a close relationship with the concept of building typology and consequently connects the realms of urban design and architectural design more forcefully. Finally, and this is the most important aspect, it allows us to measure the compactness of the urban fabric, a trait that should be considered among the requirements of sustainability.

In Europe, the traditional compactness of the historical cities began to disappear between the 1920s and the 1940s, a time when functionalism became popular as a theory for pursuing urban hygiene by means of good airflows and abundant lighting. While such a theory had plenty of good intentions, it caused buildings to spread farther apart; and, once they took hold as isolated objects, they ceased to form an urban fabric in the proper sense of the term. Each building became a thing onto itself, enclosed in its own parcel of land. This approach became the norm after the end of World War II, when the urgency to rebuild the homes that had been destroyed helped most functionalist theories to become established from a quantitative perspective. During the Sixties, the

decade of the economic boom, the massive surge in the number of cars and the need for wide urban streets consolidated this practice. Also, local municipalities came to consider vacant lots as instruments of negotiation with private enterprise, which ended up encouraging the worst kind of real estate speculation and unmemorable architecture. Under these conditions, which were common throughout Europe (with some laudable exceptions), the critical evaluation of urban form fell from favor. Even green spaces, which should have been regarded as a distinguishing factor of urban design, came to be viewed from a merely quantitative perspective.

Over the last three decades, scholars with different backgrounds have provided significant specialist literature about sprawl in the main European cities (EEA 2006; Ingersoll, 2006; Castrignanò M., Peretti G. 2011; Ehrlich, M.V., Hilber, C.A.L., Schöni, O. 2018); the same cannot be said however for small towns, whose ties with the surrounding rural land were still strong before WWII. In the seventy-five years that followed, these ties were progressively broken by the transformation of agricultural soil into countless building plots aimed at increasing land grants. The low-density buildings designed on the outskirts of towns entailed a remarkable waste of land space and an increase in social costs due to the proliferation of public infrastructure.

The case study I am about to present focuses on Fidenza, a small town located between Parma and Piacenza along the via Emilia, the most important Roman road in the Emilia-Romagna region of Italy. The first part of this study features a historical-morphological analysis of the town, where the transition from the traditional urban fabric to modern urban sprawl is described. The second part is about a “meta-project”—a term often used to indicate specific theoretical assumptions—that is meant to provide the basis for an architectural and urban concept.

The analytical part consists of a detailed revisitation of Fidenza’s history. In this context, references to the historic town do not result from a nostalgic intent. Far from reprising the picturesque or vernacular character of the town’s history, the analysis underscores its economic logic instead, which seeks to make buildings compact to save space and infrastructure. At the same time, the old town offers a criterion of recognizability of the urban form that can be examined and understood in terms of urban morphology.

The meta-project is an imaginary master plan that does not seek to present a future vision of Fidenza; doing so would be impossible, since the sites it encompasses are already occupied by existing buildings and will remain in their current form for decades to come. On the contrary, it represents “retrospective musings” on how the town might have developed from the end of WWII to the present if the urban sprawl that actually came to be had been avoided.

The choice to present the aforementioned case study, which is based on a formal analysis of Fidenza that relies on drawings rather than on quantitative data, is supposed to encourage other scholars to enhance the specific literature concerning the relationship between sustainability and urban morphology in small towns.

History of a small town’s urban form

Fidenza’s urban form came about over three distinct epochs and was more or less tied to the design of its defensive systems: the Roman era, of which almost nothing is known; the Middle Ages, by far the most important and most widely documented time; and the late-Renaissance period, which ended the phase of great urban transformations and introduced the era of individual architectural events, few of which are even worth examining.

In the Roman Age, a small urban center called *Fidentia* began to develop along the *via Aemilia*, a consular road completed in 187 B.C.E. that links Rimini to Piacenza.

In the Middle Ages, the town became known as Borgo San Donnino and was arranged into two distinct sections: to the west, the *castrum vetus*, a settlement from the Early Middle Ages centered around a small church that, beginning in 1117 C.E., went on to become the large Romanesque cathedral; to the east, the *burgo novo*, a Late Middle Ages settlement that developed parallel to the town's main street (the ancient *decumanus maximus*). These two urban areas (basically divided by the ancient *cardo maximus*) became connected via a large central square (*piazza* in Italian) that was located in the vicinity of the first Roman settlement (Figure 1-I). Two structures were built at opposite ends of this square: the municipal building and the fortified manor of the local ruler (*rocca* in Italian).

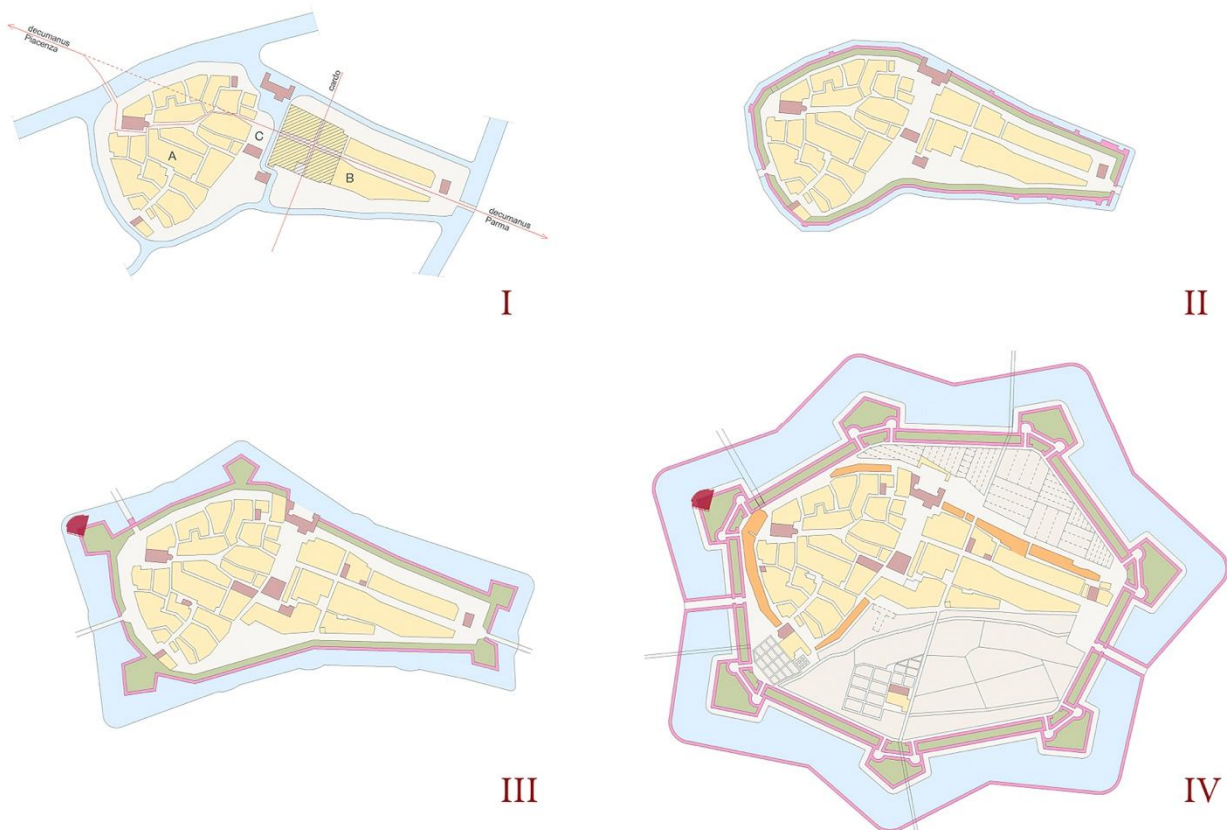


Fig.1. Nicola Delledonne, *Urban evolution of Borgo San Donnino (the medieval toponym of Fidenza) with the project site highlighted in red.* I) Early thirteenth century. A = castrum vetus; B = burgo novo; C = central square; II) Late thirteenth century. First fortifications; III) Mid-fourteenth century. Visconti fortifications; IV) Mid-sixteenth century. Farnese fortifications. [Author's Archive]

At the end of the thirteenth century, the first fortifications were built around the town (Figure 1-II). Later on, the Visconti family built a second set of fortifications in two steps: the first one, between 1354 and 1357; the second, between 1364 and 1367. Though they did not extend the town's boundaries by much, they featured a more linear and robust wall than the previous ones, and well-defined angular buttresses (Figure 1-III). Until that time, the fortifications were closely aligned with the perimeter of the city. This arrangement broke down in 1575, when the Farnese family developed the third set of fortifications, because their heptagonal shape had nothing in common with the existing urban fabric (Figure 1-IV). The construction of the Farnese fortifications triggered the transformation of the wall built by the Visconti into terraced houses, which became known as "terragli". According to a process that became common in many other medieval Italian settlements, a military infrastructure like the town's fortified wall was repurposed as residential housing for poor families, mostly made with pebble stones gathered near the Stirone, a small river centuries ago flowed much closer to the populated area. In contrast, the fate of the Farnese fortifications was quite different: they were destroyed in 1603 and were replaced by a ring road that is still in use.

From 1690 to 1731, two important religious buildings were erected near the small central-plan church of Saint Michel the Archangel, consecrated in 1537, at the east end of town: the Jesuit school, connected to the church of Great Mother of God, and the Ursulines building.

In the eighteenth century, the town was still basically contained within the footprints of its historical fortifications, which had disappeared centuries before; as a consequence, the urban boundaries were clear, as was the relationship between the developed area and the surrounding agricultural land.

In 1861, when the Kingdom of Italy was founded, the state railway connecting Milan to Bologna was completed and a new municipal theater opened. In 1913, a large building for the poor called "Casermone" replaced the Convent of San Francesco (which was later rebuilt in the suburbs), and started the tradition of public housing that was to have a remarkable expansion in Fidenza at the end of WWII.

In 1925, during the fascist era, the municipal government transformed the winding medieval street that departed eastward from the town's main square into a rectilinear street, believing that such a change would restore the *decumanus maximus*, whose northeastern segment had disappeared in the Middle Ages. As a result of this change, the cathedral was relegated to a marginal urban position. Nonetheless, in the decade between 1927 and 1937, many public buildings and facilities enhanced the quality of the town: primary and secondary schools, a public bathhouse, a water tower, a big commemorative garden in front of the Casermone, a swimming pool with an iconic diving board. The aforementioned decade opened and closed with two important events: in 1927, the town took back its name, Fidenza; in 1937, a new railway branch line was built to connect the town to Salsomaggiore Terme (9 km to the south), an important thermal center and a trendy destination for luxury tourism at that time.

Despite the increase of public initiatives in terms of buildings, infrastructures, and facilities, the first half of 20th century marked the beginning of urban expansion. The town started growing haphazardly into the space between the "terragli" and the ring road; later on, it continued to extend far beyond this boundary without any morphological strategy. With this unsustainable expansion, which reached its peak between the 1960s and the 1980s, the town wasted a lot of agricultural land, lost its recognizable form, and gave up the balance between monuments and residential buildings. This state of affairs could have been avoided had the town recognized the anthropic boundaries that

had become part of its urban history. These boundaries, which suggest a definite eastward development of the urban fabric, are: the Fidenza-Salsomaggiore Terme railway to the west; the Milano-Bologna railway to the north; and the ancient via Emilia to the south. The last two, which run parallel throughout the Emilia-Romagna region, should have created the conditions for the making of “linear city” between them, involving all of the main cities situated along the via Emilia, which would have benefited from an appropriate development in morphological terms. Moreover, a lot of agricultural land would have been saved, both north and south of the aforementioned boundaries.

Reconstruction plans after WWII

In May 1944, Fidenza was bombed three times (on May 2, 12, and 13) by the Allied Forces, who aimed to disrupt rail transportation in northern Italy. The cathedral was miraculously spared, but many other buildings nearby were destroyed or damaged; one of them was the train station.

Between January and March 1946, the municipality charged the engineer and urban planner Cesare Chiodi, who was a professor at the Politecnico di Milano at that time, to prepare a Reconstruction Plan, which was submitted in June and approved by ministerial decree in March 1947. Chiodi explained that his plan had nothing to do with the future expansion of the town; on the contrary, it was geared to deal exclusively with the pressing issues of the reconstruction.

In a way, this plan revived the ancient *ager centuriatus* system by designing a couple of urban fragments orientated according to the roman orthogonal grid. To be more precise: to the northwest, it emphasized the importance of the, so called, *decumamus* and introduced new streets perpendicular to it (Figure 2); to the southeast, it envisioned a kind of “urban mending” in which new blocks would have complemented old ones (Figure 3).

Luigi Bormioli, a municipal technical designer, submitted an alternative proposal in the same year: a system of big courtyards with inner gardens that was expected to replace the destroyed buildings near the cathedral. If adopted, this approach would have permanently erased the footprint of the urban fabric of the early Middle Ages, which is still recognizable today to some extent (Figure 4). Nonetheless, if this system of courtyards had been conceived to expand the town in a southwest direction (between the “terragli” and the ring road), the plan could have worked. More in general, this plan was the first attempt to provide the urban design of the town with a morphological concept, which also foresaw a residential expansion according to an orthogonal grid southeastward, and the location of the industrial area behind the railway northeastward (Figure 5).

Only during the biennium 1980-81, a new proposal called *Centro storico e centro città*, which was characterized by a morphological approach, was submitted to the municipality by a team of architects led by Franco Ferrari (Ferrari et al., 1981); unfortunately, it was not implemented. Nevertheless, the authors of this study must be given credit for having rediscovered the forgotten importance of urban morphology.

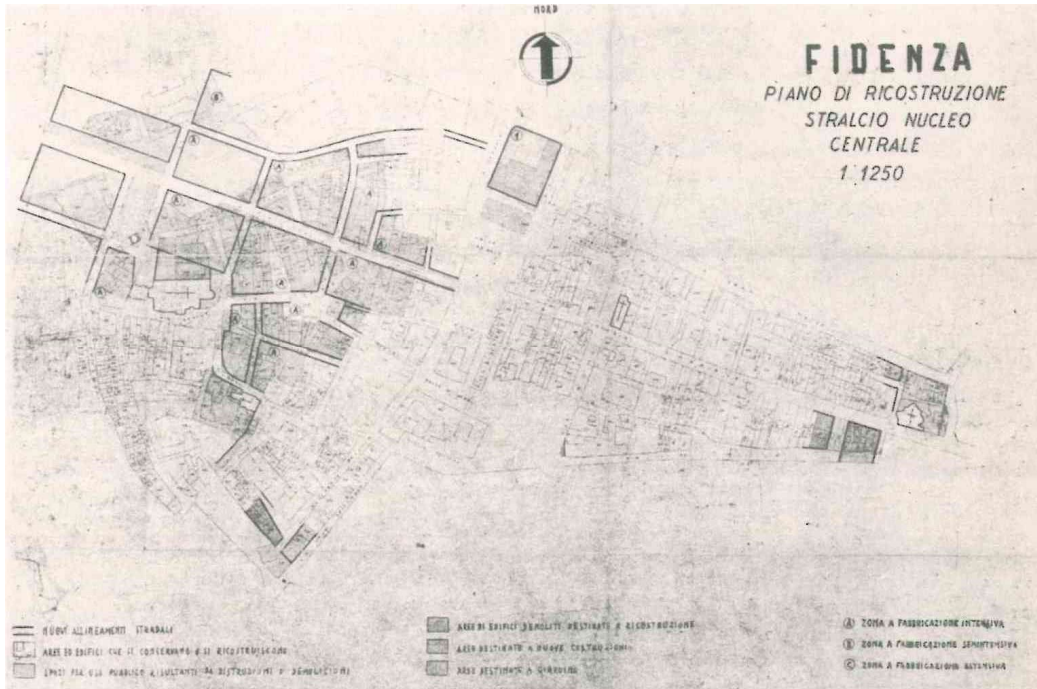


Fig.2. Cesare Chiodi, Fidenza's reconstruction plan, 1946: New street net in the northwestern side of the town [Fidenza's Municipal Archive]

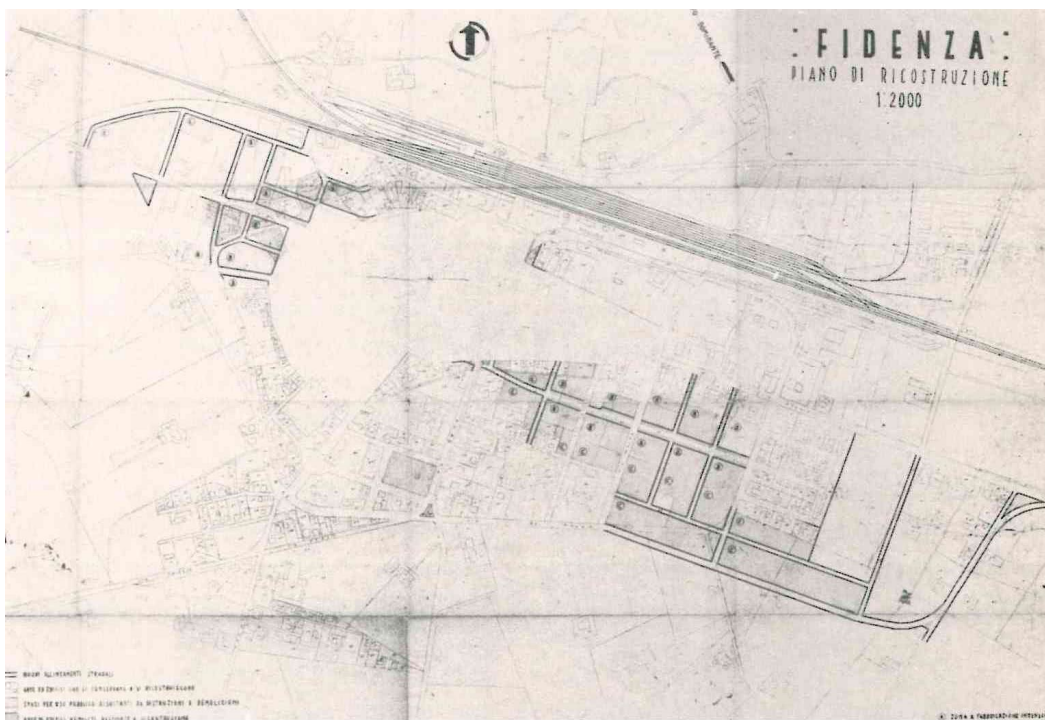


Fig.3. Cesare Chiodi, Fidenza's reconstruction plan, 1946: New street net in the southeastern side of the town [Fidenza's Municipal Archive]

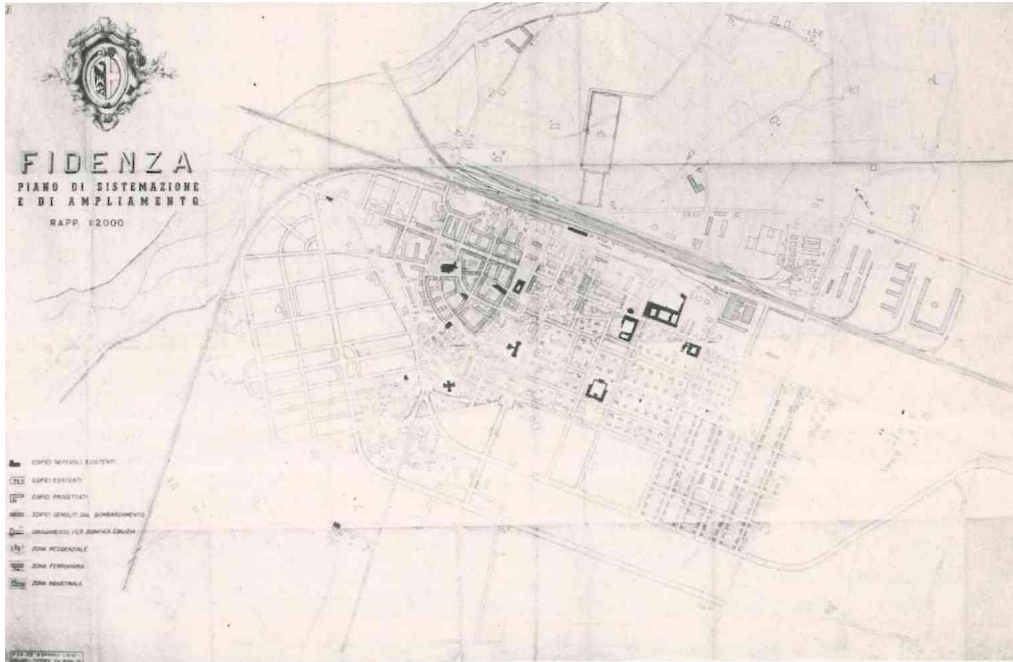


Fig.4. Luigi Bormioli, Fidenza's reconstruction plan (alternative proposal), 1946: New system of urban blocks with inner courtyards in the southwestern side of the town [Fidenza's Municipal Archive]

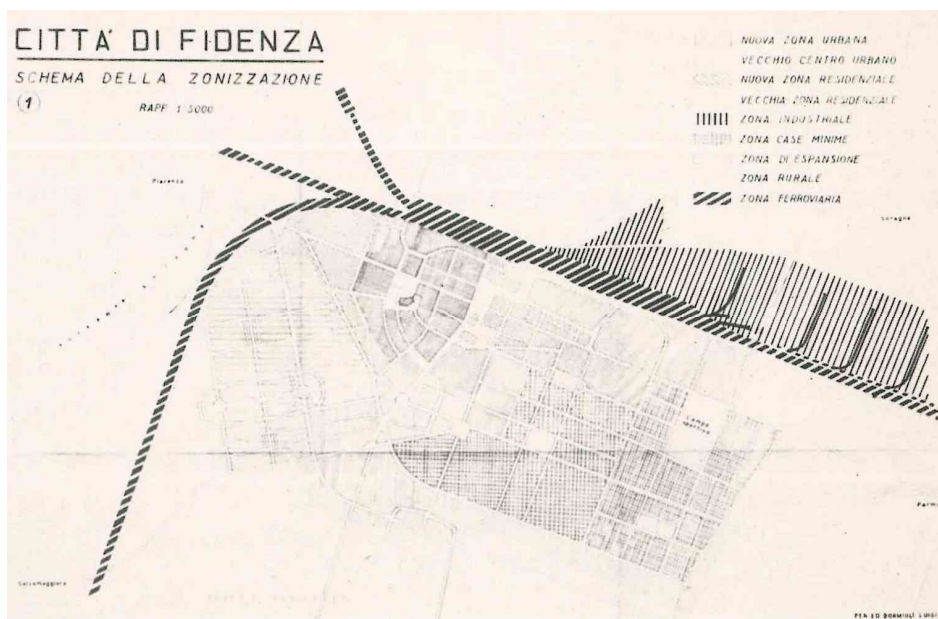


Fig.5. Luigi Bormioli, Fidenza's reconstruction plan (alternative proposal), 1946: Land use plan [Fidenza's Municipal Archive]

The meta-project

In late 2005, the Municipality of Fidenza hired me to design a collective residence for older but independent people (Stasi, 2019) with limited financial resources (Figure 6). I saw this professional appointment as an opportunity for reflection on the loss of identity of the urban form that, from the time of post-war reconstruction to the present, has marked the town’s development. This is why I envisioned my building as a fragment of a meta-project named *Forma Urbis Fidentiae*—the plan as well as the form of Fidenza—that should have represented the outcome of an urban project made sixty years earlier, at the end of WWII (Figure 7). This imaginary premise allows us to deal with an issue that is still on the agenda today: the remaking of a town onto itself.

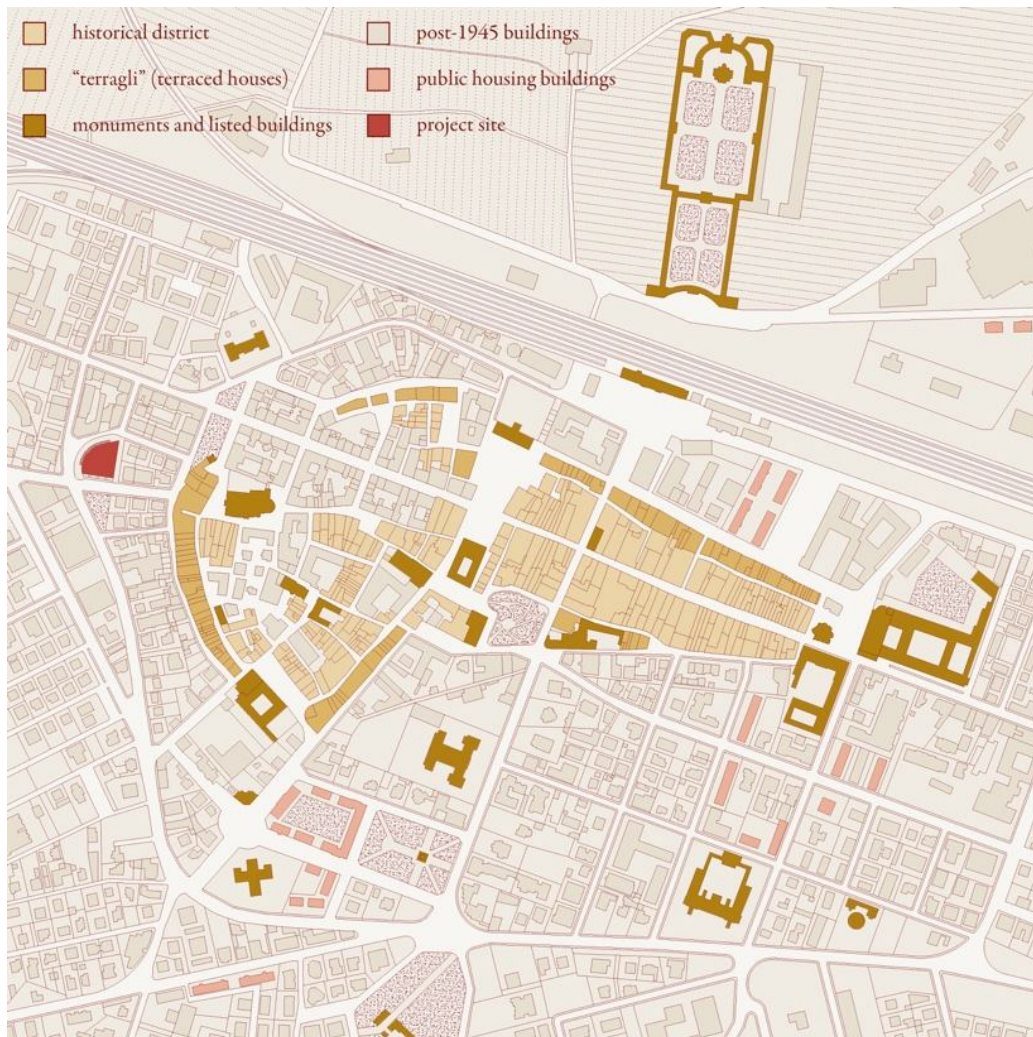


Fig.6. Nicola Delledonne, Site plan of the new residence for the elderly (highlighted in red), 2006 [Author’s Archive]

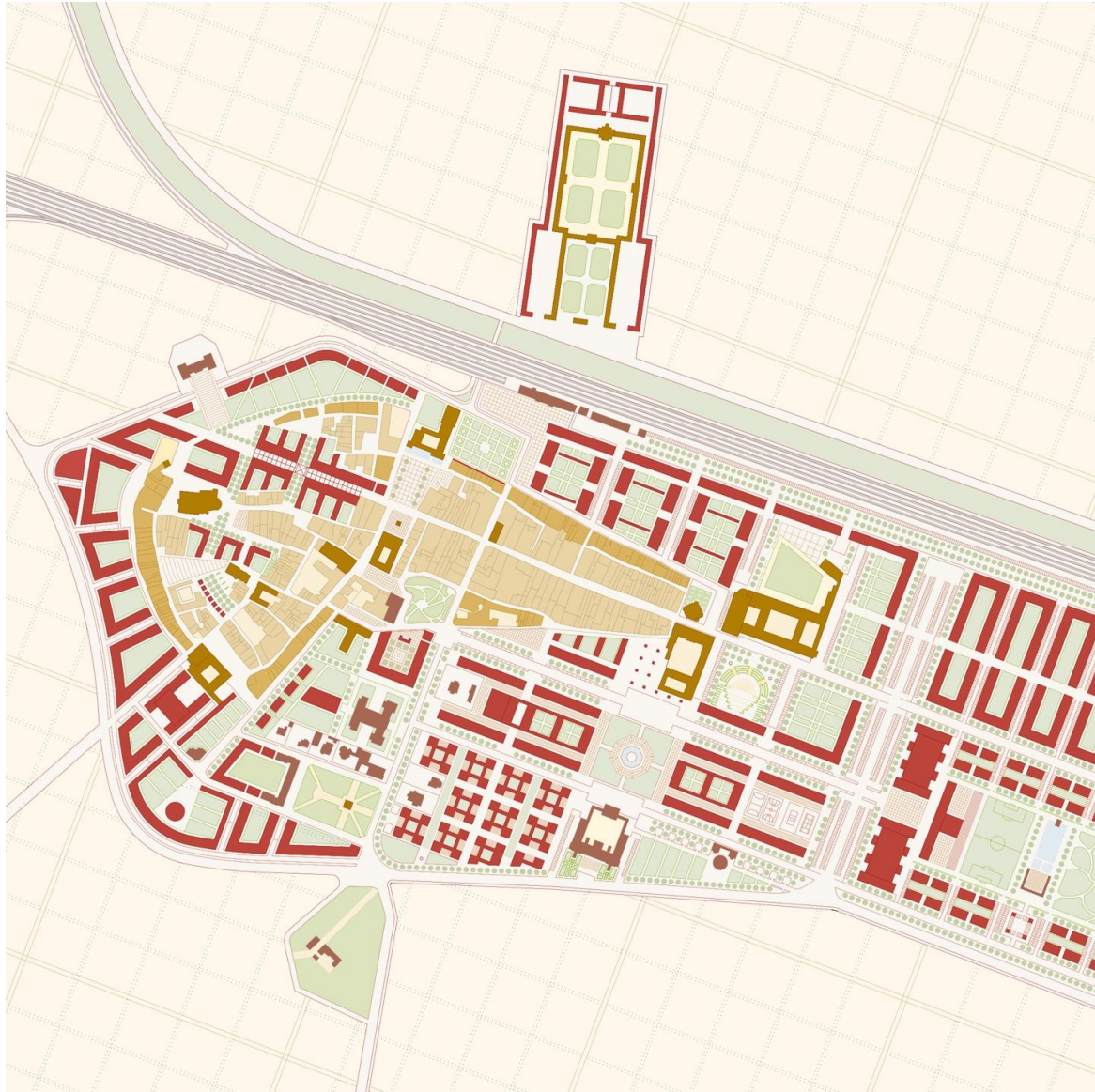


Fig.7. Nicola Delledonne, *Forma Urbis Fidentiae*: Meta-project, 2006.
 [Author's Archive]

In the western part of Fidenza, the meta-project differed significantly from the 1946 reconstruction plan, since it proposed a system of radial courts, which—roughly-speaking—were ideally centered around the cathedral and the main square. From a morphological standpoint, these courts were designed to let the old footprint of the Farnese fortification resurface; from the typological standpoint, however, they were meant to evoke rural settlements in the surrounding countryside, both in terms of form and size. They also had to look as large semi-public green areas, aimed at bringing nature into the town. To be clear, this idea is diametrically opposed to the notion of the “garden-city,” which was designed to bring the town into the middle of nature instead.

Needless to say, such a notion produced the rise of a great deal of low-density buildings in many areas of previously undeveloped land, as well as a great waste of public infrastructure, throughout the twentieth century.

In the northernmost part of town, the system of green public spaces was meant to be complemented by vegetable gardens that should have been protected to a degree by an array of houses built along the edge of the ring road. A curved, tree-lined street was to connect the old fortified manor (which was to be preserved and transformed with the addition of new geometrical gardens, reflecting an old map of the town) to the archaeological site that lies at the foot of the medieval tower, in front of the cathedral.

In the eastern part of town, the meta-project reprised the orthogonal grid that had been suggested by the reconstruction plan based on the ancient Roman system of *cardines* and *decumani*. Even so, it introduced some changes. Two tree-lined parallel streets formed a large area reserved for pedestrian traffic and designed to host several school complexes, all directly connected to the schools mentioned earlier. The meta-project envisioned large courtyard housing complexes north of this area and small single-family or two-family homes to the south. The easternmost side of the plan was characterized by the presence of two typologies of affordable homes: large courtyard housing on the north end and small multi-family buildings on the south end, both provided with semi-public gardens. A large sport complex, which included indoor tennis courts, a soccer field, the old swimming pool and a new landscaped garden, was meant to serve as an attractive meeting place.

All of the meta-project's buildings were designed to be four stories tall and twelve meters wide and not to differ greatly from the homes in the town's historic district, which they would be in close proximity to. Each new building included underground parking spaces to leave ground-level space available for shops and small workshops. This would have ensured mixed-purpose urban spaces, in keeping with the best traditions of Europe's historical towns and avoiding the segregating approach of modern *zoning*. The large grassy courtyards, which were a truly characteristic element of the meta-project, would have offered semi-public, manicured green spaces in contrast with the typically unregulated and sometimes messy yards that are subject to their individual owners' whims and different motivations.

The arrangement of the streets would have followed a hierarchical system, and only major ones would have allowed vehicular traffic. Finally, the surrounding countryside would have retained its agricultural land, as it was bound to the north by the railroad and to the south by the ring road.

Conclusions

As the inspiration for my project for the new residence for the elderly, the imaginary meta-project leaves room for an additional explanation. If we accept that the notion of sustainability is not limited to construction systems or technological devices, a broad debate can be sparked on the role of urban design in the development of towns or, even more plausibly, in the process of rebuilding them onto themselves by replacing or renovating their obsolete portions. In an era when local municipalities, especially in Italy, are forced to finance themselves through planning fees, the possibility of developing large cohesive urban projects is minimal. When public financial resources are scarce, local governments must seize the opportunity to obtain funding from private entities. And private entities usually invest in selected projects based on their particular interests.

Consequently, it becomes even more important for local governments to undertake general urban projects that go beyond common planning systems, in order to effectively control the development of a city in qualitative terms. One way to do this is through public initiative projects; more specifically, through projects such as public housing or affordable housing. These types of construction projects, which were widely studied by architects in the first half of the nineteenth century, have become underrated lately, if not altogether neglected. It is through such projects that the relationship between urban morphology and sustainability can once again rise to prominence.

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