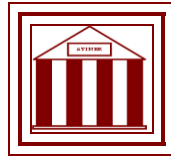
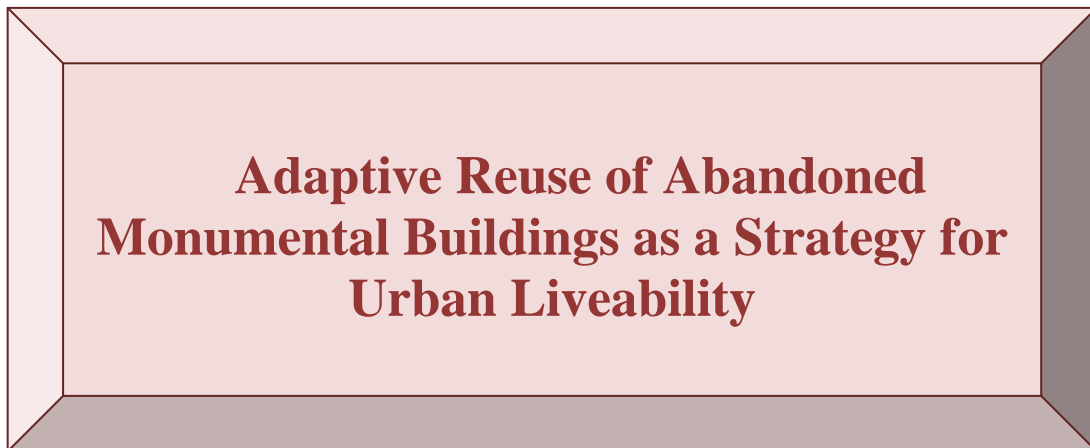


**Athens Institute for Education and Research
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**ATINER's Conference Paper Series
ARC2015-1614**



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University of Cagliari
Italy**

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Adaptive Reuse of Abandoned Monumental Buildings as a Strategy for Urban Liveability

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Abstract

This proposal is intended to be **a contribution toward achieving more liveable cities through the revitalization of inner areas based on the restoration and rehabilitation of historic facilities in order to meet current needs**. The research starts by posing several questions. What is the potential of abandoned monumental buildings for renewing and regenerating inner-city areas of our cities? What future do we imagine for old buildings that historically have played a significant role in the civic structure of a community and that still contribute to forming the memory and identity of a society? Can we suppose that the recovery of abandoned buildings could be a virtuous practice not only in terms of sustainability for their enormous potential but also for the role that public landmark centralities can play in social revitalization and urban regeneration? The complexity of this issue is addressed by analyzing related cases, relevant for their design solutions and effects, and proposes answers to the opening questions by investigating a relevant case study, the adaptive reuse of the *Ospedale of San Giovanni di Dio* in Cagliari, Italy.

Starting from its original urban vocation, a place of healthcare for the whole city, the research envisions to re-functionalize Cagliari's historic hospital maintaining its soul, and at the same time introducing new uses. Through preservation and adaptive reuse, we aim to create a civic landmark and a cultural and social meeting, a city gateway capable of strengthening the civic character and at the same time of enabling dynamic relationships in the lives of citizens.

Keywords: Adaptive reuse, Built heritage, Greening historic buildings, Historic hospitals, Recycling, Sustainable preservation

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Introduction

Nowadays, an increasing number of European cities are experimenting with interdisciplinary and collective strategies for rehabilitating their industrial and residential buildings that have become empty or underutilized, open spaces that have been abandoned and forgotten.

In investigating the theme of adaptive reuse of a city's unused places it is important to note certain differences between European and North American cities. In the United States, after World War II, the rise of the middle class brought about the gradual abandonment of blighted areas in the vicinity of large factories, the birth and explosive expansion of the suburbs, and the abandonment of the inner cities. Since then the gradual dismantling of the manufacturing industries and the conversion of the economy to service, research and technological innovation sectors have triggered massive processes of depopulation and the abandonment of entire cities, which have often, especially in the so-called "rust belt" cities, taken on an apocalyptic character and imposing size¹. In Europe, on the other hand, the origins and implications of this phenomenon have been profoundly different. In most medium and small-sized cities, the processes of abandonment of buildings and terrain have been slow and silent and have mainly affected the interstices of the city and ancient and modern relics. After the demolition of the medieval defensive walls, which occurred mainly in the nineteenth century, European cities have superseded their historical limits and initiated a process of occupation of their outlying territories, triggering a rapidly expansive, centrifugal movement which has generated extensive urban sprawl, characterized by high-rise buildings interspersed with empty extensions often devoid of identity. The relationship between the center and the outskirts, between the historic city and the new modern districts, has often been contentious and has rarely been carried out without negative side effects: the forceful urban thrust toward the periphery has left behind it a hidden geography of buildings and spaces that are abandoned or underused. While urban planners, architects and administrators have focused their attention on a polycentric model, the urban areas of the nineteenth and the first half of the twentieth century have been left behind: small and large public buildings have been deprived of their original functions, which have been decentralized in the new big containers of the expanded city, while large and small inner city spaces have remained hidden behind their tall city walls, inaccessible and unexplorable. All European cities are full of these places; conflicts between public and private interests, and the lack of adequate sensitivity have prevented them from being appraised as precious urban artifacts. Nowadays, when the pressure on infrastructures is evident and resources are decreasing, European cities, hit by the economic crisis, have ceased their outward expansion and turned back toward their forgotten centers. Thus, administrators, architects, planners, contractors and citizens have

¹A. Coppola, *Apocalypse Town* (Laterza, 2012).

initiated a process of reassessing what exists and aim to rethink the city in terms of liveability, sustainability and health.

Cities enacting policies aimed at creating a more liveable and healthier ambience are regarding their existing resources with great attention and interest. Reusing spaces and buildings that have become obsolete is an important strategy for sustainable development and a relevant answer to the excessive use of resources resulting from the destruction and redevelopment of the existing stock.

After having explored the literature and the state of scientific research into the reasons of those who argue that reuse will help build a more sustainable and liveable city, this research tries to make a contribution to the debate and new instruments for evaluating actions to undertake in order to make cities a healthier place in which to live.

This proposal is intended to be a contribution toward achieving healthier cities through the revitalization of inner city areas based on the restoration and rehabilitation of old abandoned facilities in order to meet current needs. The complexity of this issue is addressed by analyzing related cases, relevant for their design solutions and effects, and proposes answers to the opening questions by investigating a relevant evidence, the adaptive reuse of the *Ospedale San Giovanni di Dio* in Cagliari, Italy.

Ideas and Discussion: Tools and Parameters for Achieving Healthier and More Liveable Cities through Regeneration of Abandoned Monumental Buildings

Currently, cities are discovering a hidden, unexpected treasure: unused places and buildings, disused urban factories, abandoned interstitial spaces, large civic buildings no longer suitable for hosting the functions for which they were designed. It is in this phase that the need for change presents itself: demolition to make way for a new construction of some form of reconstruction or reutilization.

Especially in Europe, this heritage is a great potential to refer to in order to improve already activated policies for making cities more hospitable and liveable. The reasons are complex and detailed, and this document does not seek to demonstrate effectiveness and benefits, but, starting with an analysis of the scientific literature on this subject, we will outline the main relationships between the healthy city project and the existing practices of reutilization. Subsequently, these relationships will be explored by analyzing a case study and the potential of adaptive reuse for achieving healthier cities will be tested by using the tools of architectural design.

Sense of Identity, Cultural Heritage and Liveability

The ongoing debates on urban sustainability tend to focus on technical issues, such as the reduction of heat dispersion in buildings, waste management, harmful emissions into the atmosphere, or on the economic

aspects of urban planning, or on the technical aspects of the restoration, such as the ways and means for conserving historical relics. Increasingly, however, governments recognize the role that the existing city, and particularly its cultural heritage, plays for the social welfare of different groups living within increasingly cosmopolitan cities². So, in the specific case of the historic buildings that, while having been abandoned, are also part of a cultural heritage³, if the idea of demolishing them cannot be practiced on account of the legislative protection meant to protect them from reckless actions, certainly no one could even imagine a fate other than restoration and reutilization of the buildings that contribute to the cultural identity and to the sense of belonging to a place of a whole community⁴. The shared assumption underlying these statements is that the buildings are carriers of meanings and values. Tweed and Sutherland point out how the research, undertaken in the sixties by Kevin Lynch, and subsequently developed by scholars of environmental psychology, was based on the assumption that buildings are carriers of meanings and that citizens perceive them in relation to the meanings that they are able to recognize and associate to them⁵. In particular, Tweed and Sutherland underline how Amos Rapoport, in distinguishing the meanings in three different levels, locates in the upper meaning, fundamental values related to the cultural patterns, philosophical systems, and religious identity of a community⁶. These symbolic meanings are completely absent in the contemporary environment and are a unique intangible value in historical heritage. Citizens associate historic buildings with meanings that are the basis of the sense of belonging to a community and of local identity, and, therefore, safeguarding buildings has positive impacts and promotes living conditions making cities safer and more liveable places.

Density and Proximity (Walkability and Bikeability)

Walkability and bikeability are two factors that contribute to strengthening the relationship between the health improvement of a city and the reutilization of its abandoned centrality. Clearly, the reutilization of buildings and unused structures helps to multiply a city's functions and opportunities accessible from several points through public transport, bikes or walking. Walkability and bikeability are important components in the policies aimed at promoting liveability and creating healthy living environments. In terms of urban sustainability, compactness and density are recognized qualities which play an

²C. Tweed and M. Sutherland, "Built cultural heritage and sustainable urban development." *Landscape and Urban Planning*, 83, (2007): 62-69.

³*Sul Restauro* (Domus 715, 1990).

⁴J. Cramer and S. Breitling, *Architecture in existing fabric: planning, design, building* (Birkauer, 2007).

⁵K. Lynch, *The Image of the city*, (Cambridge: MIT, 1968).

⁶A. Rapoport, *The Meaning of the Built Environment: A Non verbal Communication Approach* (SAGE Publications, 1982).

important role because they contribute to shortening distances and encouraging sustainable mobility⁷.

In this regard, Stephen Marshall says that a city should therefore promote and encourage pedestrian-friendly street design as an opportunity for reducing air pollution, the social costs of individual transportation and automobile dependency. Moreover, all this helps to increase the sense of belonging to a place and a sense of community⁸. Moreover, it helps to emphasize the fact that the walkability of an urban center is not simply determined by proximity, but also that other factors such as the design of the routes and public spaces, contribute heavily. However, one of the conditions that motivates citizens to give up private cars and travel by bicycle or on foot is that attractive places and collective services are easily accessible. For these reasons, the design of the adaptive reutilization of buildings contributes to the project of a more liveable and healthier city.

Economic Benefits

In reflecting on the links between the liveability and economy of a city, Moretti argues that in many cases cities gain in appeal because they succeed in building a solid economic base, and not vice versa. Citing the case of Seattle, as an example of a city that over the years has undergone decay and abandonment, he states that the processes of economic revival are not directly triggered by the attractiveness and liveability of the urban environment. However, Moretti does not exclude the attractiveness that a city is able to exert on business and investments can be encouraged by the policies of urban regeneration that, as in the case of Seattle, are focused on the recovery and reutilization of buildings and the abandoned spaces of the twentieth century city: crumbling warehouses were recovered to make room for dozens of small startups and the economic revitalization of a city is accompanied by projects for restoring pieces of abandoned cities⁹.

Land Waste and Public Space

The practices of reutilization are central for reinserting derelict yards and forgotten open spaces in the network of a city's active places and spaces. These are often impeded spaces, or courtyards attached to industrial or residential buildings that originally had a direct relation to the authentic outdoor extensions of the activities that took place there. Usually these places are inaccessible, separated from the city by high walls and insurmountable barriers. Rethinking about abandoned buildings and adaptive reutilization makes it

⁷G.B. Dantzig and T. Saaty, *Compact City: A Plan for a Liveable Urban Environment* (San Francisco, CA: W.H. Freeman and Co, 1973).

⁸S. Marshall Wheeler and T. Beatley, 2014. *Sustainable Urban Development Reader* (Routledge Urban Reader, 2014).

⁹E. Moretti, *The new Geography of jobs* (Houghton Mifflin Harcourt, 2012).

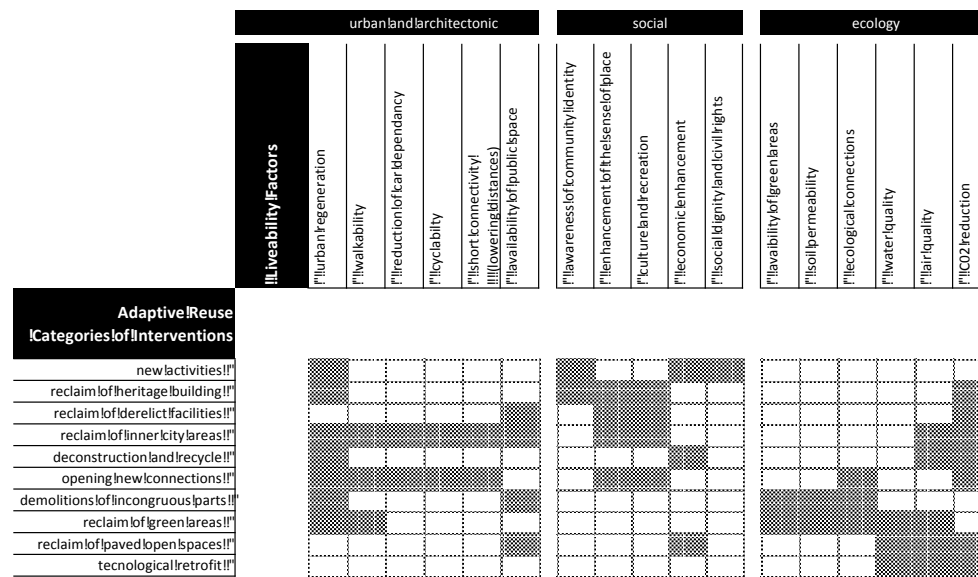
possible to rethink ties and connections between open spaces and buildings¹⁰, and to start new relationships with the city by breaking down perimeters of separation and opening up new connections. In this way, the potentialities of the reutilization of forgotten urban spaces are remarkable: covered spaces offer new opportunities for regenerating a city, engaging in new relationships, building new squares, and activating new unexpected connections between the different parts of a city.

Main Relationships between the Healthy City Project and Existing Practices of Reutilization

Considering the findings of the literature review and the analysis of several case studies, a plausible correlation between actions of adaptive reuse and the desired objectives of health and liveability of the city is shown.

Table 1 below, summarizes the relations between livability aspects and categories of adaptive reuse interventions: it highlights how some actions partially act on certain parameters of urban living, and others specifically activate others. Consequently, the project, in each case, should identify actions and guide choices in order to enable the spectrum of virtuous scenarios which influence the quality of an urban settlement.

Table 1. *Correlation between Actions of Adaptive Reuse and the Desired Objectives of Health and Liveability of the City*



This chart should not be considered exhaustive of all factors that can determine choices of the various actors - administrators, architects, town

¹⁰ F. Astorg Bollack, *Old Buildings new forms, new directions in architectural transformations* (Monacelli Press, 2013).

planners, citizens' associations, stakeholders - who are called to define future scenarios. However, a simplification and a reduction is necessary in order to enable lucid decision making driven by clear categories and operational instruments.

Exploring Findings and Implications: A Case Study, the Adaptive Reuse of the Ospedale San Giovanni di Dio in Cagliari

In the initial phase of our investigation we have posed certain preliminary questions in order to mark off our topic and the range of our research.

What is the potential of the abandoned monumental buildings for renewing and regenerating inner-city areas? What future do we imagine for those old buildings that historically have played a significant role in the civic consciousness of a community and that still contribute to forming the memory and cultural identity of a society? Can we suppose that the recovery of abandoned buildings could be a virtuous practice, not only in terms of sustainability for their enormous potential, but also for the role that public landmark centrality can play in social revitalization and urban regeneration?

The complexity of this issue is addressed by analyzing related cases, relevant for their design solutions and effects. Answers to the opening questions are suggested by investigating a relevant case study, i.e. the adaptive reuse of the *Ospedale San Giovanni di Dio* in Cagliari, Italy (Figure 1).

Figure 1. *The Ospedale San Giovanni di Dio, Late XIX Century View*



Abandoned Hospitals, Selected Experiences

During the last 15 years, the adaptive-reuse of abandoned civic facilities, especially hospitals, has been a core issue in the debate about the future of cities¹¹. Through an analysis of case studies, several examples emerge which tell us a great deal about practicable solutions.

We should consider that, in most cases, eighteenth and nineteenth century hospitals are very remarkable works of architecture. Furthermore, these buildings, because of the relevant role they played in the past, make a powerful contribution to forming the cultural identity of a community. There is a general popular sentiment against abandoning or even demolishing them. In most cases these buildings are located in the inner city areas, which makes them easily accessible and constitutes a great opportunity for the renovation of the surrounding spaces and facilities.

Several recent European experiences encourage the choice of adaptive reuse, a term that refers to the revitalization of abandoned urban areas or abandoned buildings. Adaptive reuse signifies converting old buildings to new uses that are compatible with existing needs and realities. Adaptive Reuse helps to preserve the history and identity of a community, as well as to stimulate private investments for the introduction of innovative functions capable to attract private funds¹².

In several cases the new function is a hotel: the *Vighi* monumental Hospital in the Italian city of Parma, an eighteenth-century building, was recently converted into a five-star hotel, an enterprise financed with private funds. The *Bethanien Hospital* in Berlin is a nineteenth century building which, with the use of public funds, was converted into the *Kunstlerhaus*, a broad complex dedicated to art, culture and education. Figure 2 shows the *Am Urban Krankenhause* in Berlin which was recently converted, with the use of private funds, into private offices and homes. There are many other relevant cases examined, which for brevity we do not name. The odd part of this story is that in most experiences these buildings have been converted to a new, completely different function, whose positive aspect is the new life to which they have given rise. Sometimes the only sign of their glorious past is, as in the *Bethanien Hospital*, the old pharmacy room with its original furniture.

¹¹B. Plevoets and K. Van Cleempoel, “Adaptive reuse as a strategy towards conservation of cultural heritage: a literature review.” *WIT Transactions on The Built Environment*, 118 (2011).

¹² K. Powell, *Architecture reborn. Converting old buildings for new uses* (Rizzoli international publications, inc, 2012).

Figure 2. *Urban Hospital in Berlin: Today is Converted to a Residential Complex*



Our aim is to investigate the opportunity of reusing historic hospitals introducing new functions while also maintaining a healthcare-oriented functionality.

Abandoned hospitals need to be analyzed and evaluated in a specific way. Often, they have an exceptional significance on account of the notable infrastructures, which distinguish them from other types of buildings in disuse. Historic hospitals in Europe and the rest of the world share a common destiny: fitted out in the past with innovative typological and morphological features, they have become obsolete: made in the past with innovative type-morphological characteristics, outdated today. The complexity of this theme can be addressed beginning with the following questions: what can be done with historic monumental hospitals? How should we deal with buildings initially conceived to be as places of care and treatment that are no longer capable of serving as a modern facility? What future can we conceive for historic hospitals, and for all other civic facilities, in order to achieve a healthier city?

The case study described in the following pages is a research project divided into several phases starting from an analysis of historical documents, and an in-depth knowledge of the current situation, in order to determine potential and compatible features¹³. The case study is chosen as a prime example for investigating how the renewal of a structure that is underutilized

¹³B. Reichlin and B. Pedretti, *Riuso del patrimonio architettonico* (Mendrisio Academy Press, 2011).

and destined for abandonment may trigger virtuous processes in order to achieve the objectives of health and liveability of an urban environment.

An Outstanding Case-Study, the Ospedale San Giovanni di Dio in Cagliari

The research study responds to the main issues by investigating the old *San Giovanni di Dio* historical hospital in Cagliari (Italy). This masterpiece is an extraordinary innovative nineteenth-century building located in the historic part of the city, designed by Gaetano Cima, a master of Sardinian neoclassical architecture. After more than 150 years, the building is still there, as shown in Figure 3, having survived the bombings of the Second World War, but deprived of its original function and waiting for a new life.

Figure 3. *The Ospedale San Giovanni di Dio, Present Day Aerial View*



Investigating Opportunities, a Research Procedure Divided in Sequential Stages

The investigation is divided into successive steps, starting from a preliminary historical analysis, passing through an evaluation of new uses compatible with what already exists, and ending with an evaluation of new scenarios oriented to enhance the urban environment liveability.

The first step deals with reading documents, surveying the present status and understanding what already exists.

The solutions adopted by Cima were amazing if compared to what was designed and built in Italy and in Europe in that period: separate pavilions and horizontal diffusion were the general tendency in the hospital design. Cima imagined an innovative building conceived as a real urban device, capable of relating to the surrounding city (Figures 4, 5, 6, 7).

Figure 4. *The Original Ground Floor Drawing (1844)*

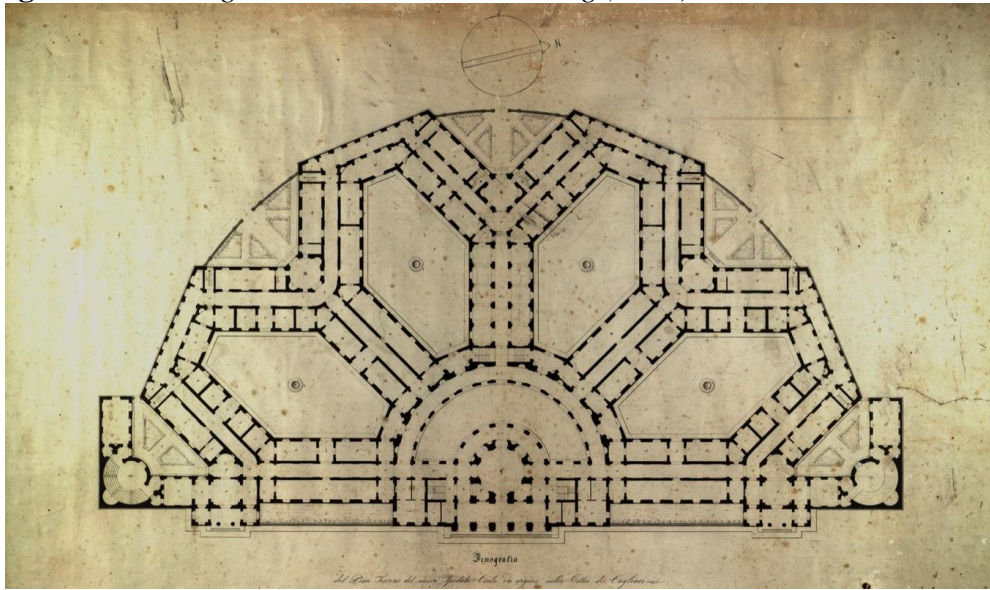


Figure 5. *Section Drawing (Late XIX Century)*

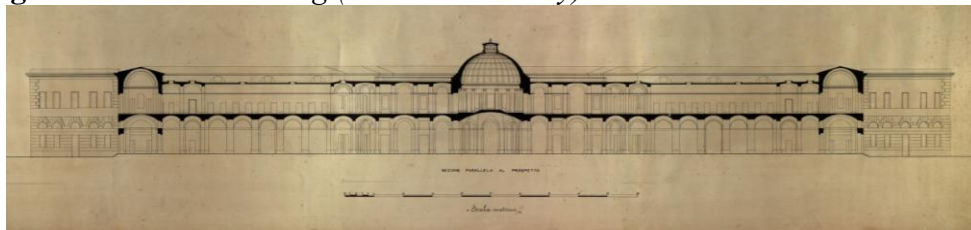
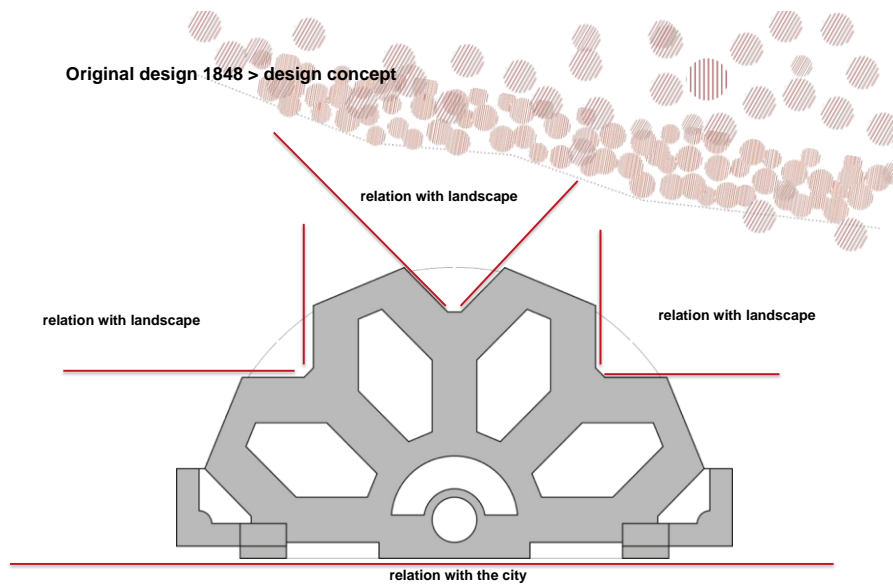


Figure 6. *An Archive Photo of the San Giovanni di Dio Hospital (1870)*



Figure 7. *Relations with the City and Landscape*



The relationship with the outskirts is a key element for understanding the original constitutive design concept. The shape is strictly related to the surrounding elements: a street-related linear façade and a more articulated shape of its back, which faces the landscape (Figure 7).

On the ground floor, the entrance hall and the semi-circular connection form a whole, characterized by the same quality that today designers pursue conceiving the internal “hospital-street” as a core path. On the first floor there are blocks alternating to courts and forming a pleasant sequence globally shaped as a pleasant sequence of petals. This is a precise answer to an urgent need of conceiving highly organized sequences of wards, rationally divided, separating males from females, and furthermore shaped to ensure an excellent quality of ventilation: a vital requirement in order to prevent uncontrolled spreads of infections. Also, gardens for patients and staff were preeminent components of the original concept, clearly designed by Cima for fostering the strategy of strict interaction and the mutual enhancement of the closed and open spaces.

The second step consists in analyzing the building’s current status in order to evaluate the historical and typological elements to be preserved. This is the phase of an accurate survey of what already exists. Comparing the original project to the present condition, studying documents and interpreting the fabric’s current status, has been a key step for outlining the different construction phases, assessing its present state and attributing appropriate values to the different parts. Through this process, we can distinguish additions, incongruous parts, relevant stratified evidence of the various interventions that have occurred over time, and then evaluate which (if any) parts should be demolished.

The third step concerns the restoration of the building. In order to preserve a building's history, recent and remote, the architect evaluates which parts are relevant and which are not. The goal is to preserve and transmit memory by erasing the incongruous parts of the building. Only with a very accurate knowledge of what already exists it can become possible to identify the appropriate interventions: demolition of incongruous elements, restoration of corrupted parts.

In the fourth phase, the opportunities and constraints are evaluated as extremely significant elements in defining compatible functions. The constituent parts of the building are highlighted and the opportunities closely related to the intrinsic qualities of the building are assessed: natural light, ventilation, exposure, architectural quality, flexibility, suitability to modify or expand volumes, and potential connections with the surrounding city (Figures 8, 9, 10).

Figure 8. *Analysis of Adaptive Reuse Potential: Relations with the Surroundings*

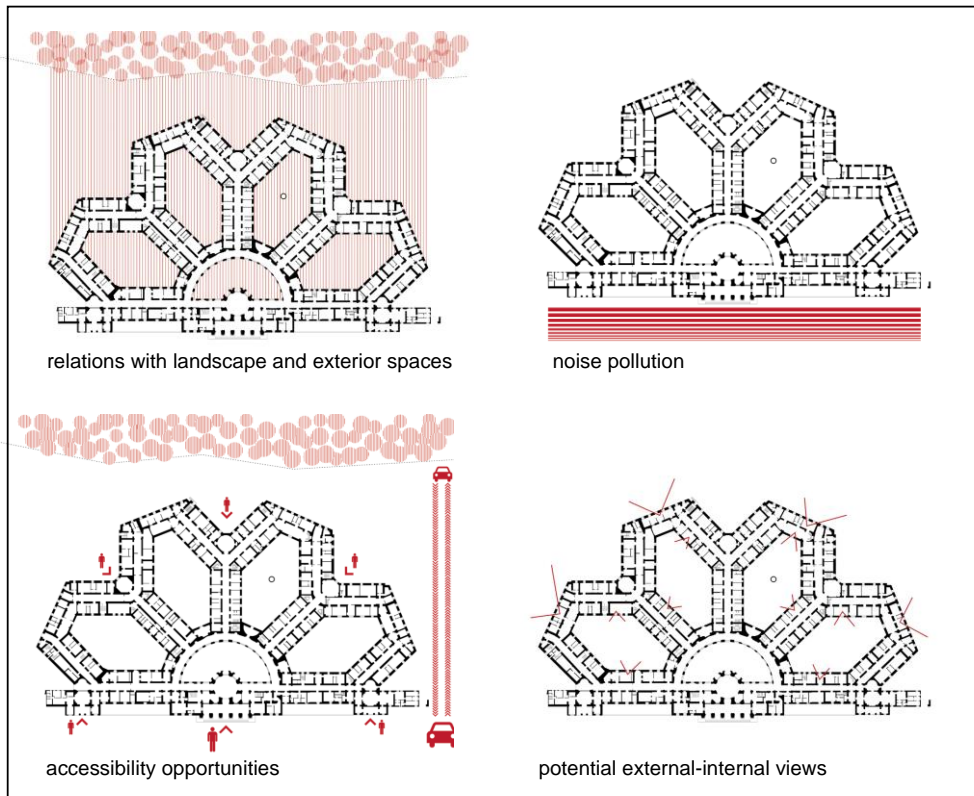


Figure 9. *Noise Pollution Map*

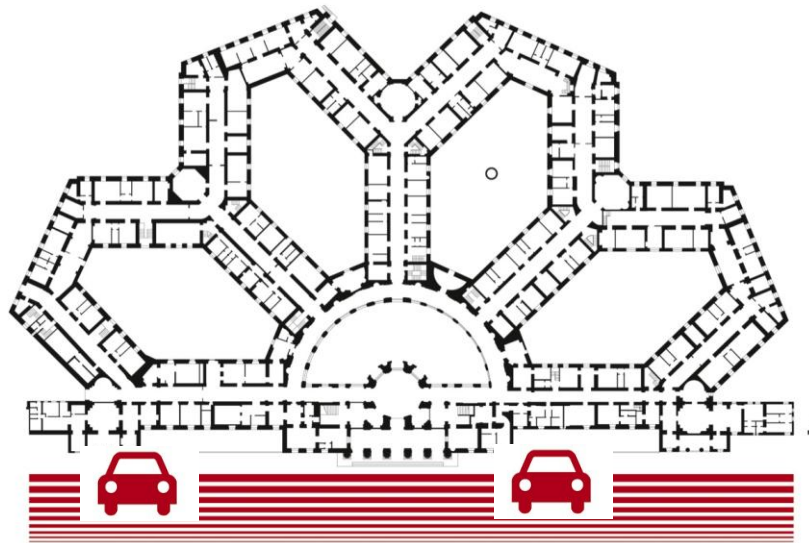
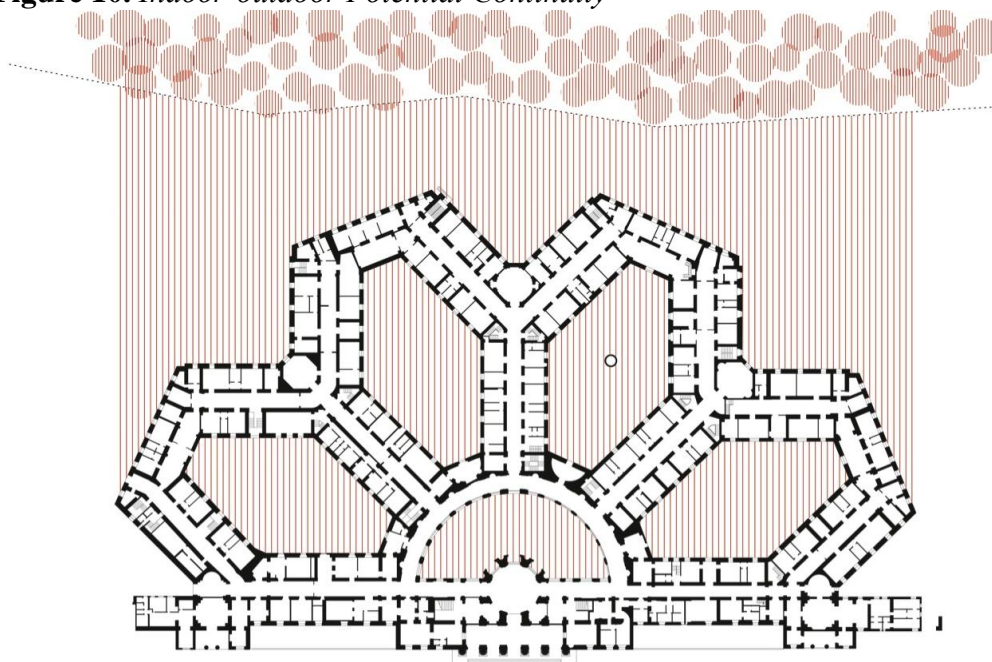


Figure 10. *Indoor-outdoor Potential Continuity*



Considering the general objectives, the fifth step is the most crucial part of the entire process: in this phase the scenarios for selecting new functions are analysed. During this extremely delicate stage, in the framework of in-depth knowledge of the current status, constraints and opportunities, features that meet several requirements are chosen in accordance with five key factors:

- compatibility with the architectonic quality and historical value of the existing historical elements;

- compatibility with the size and shape of the available space and potential;
- economic feasibility;
- ability to activate a link with the community;
- ability to regenerate surroundings and to activate connections with the urban environment.

This list should not be considered an exhaustive of all the factors that can determine the choices, but a simplification and a reduction is necessary in order to enable lucid decision making driven by clear categories and operational instruments. To the objectives of urban regeneration and the increase in health and liveability of a given context, certainly the last two factors contribute in a overwhelming extent.

Starting from its original urban vocation (a place of healthcare for the entire community), design envisions refunctionalizing Cagliari's old hospital by maintaining its soul, and at the same time introducing new features marked by a strong character that contribute to form a civic landmark and a cultural and social meeting space. This is a way to strengthen its civic role and at the same time to foster dynamic relationships in citizens' lives.

That being so, in the specific case of the Ospedale San Giovanni di Dio, the results of the analysis of the previous phases have suggested the creation of a *wellness center* as an alternative to abandonment and decommissioning. The wellness center is a fairly new type of hybrid structure for health care that incorporates three main functions: clinic, fitness and SPA.

At the beginning of the design process, the compatibility between what already exists and the proposed new function is tested by investigating a few reference parameters deduced from several case studies:

- space requirement and compatibility with the existing space
- spatial features
- accessibility
- ability to connect with the city and citizens

Considering the relations between livability aspects and the categories of interventions, briefly summarized in Table 1, research uses tools of architectural design to verify overall plausibility of the assumptions by simulating an operational projection.

First of all, referring to the general objectives indicated in the introduction, it seems that the demolition of incongruous parts and the recovery of green area is particularly effective in this case. In fact, in the case study, the project opens up new prospects for regeneration and connection to the city networks by choosing the demolition of incongruous additions (Figure 11) that over time had progressively saturated the outdoor spaces: the courtyards, freed from volumes, are reintegrated into the complex spatial and city life, connected by walkways and public rethought as real public squares.

Also, the design strategies pursue the liveability goal by redefining the role of the old surrounding open spaces, which were once the vegetable gardens of the hospital: the design of outdoor spaces becomes an opportunity to reclaim inaccessible places, new gardens and green areas inside the historic city, able to expand and redesign the weft of public spaces within the historic city.

Figure 11. *Current Status Ground Floor Plan, Incongruous Volumes to be Demolish*

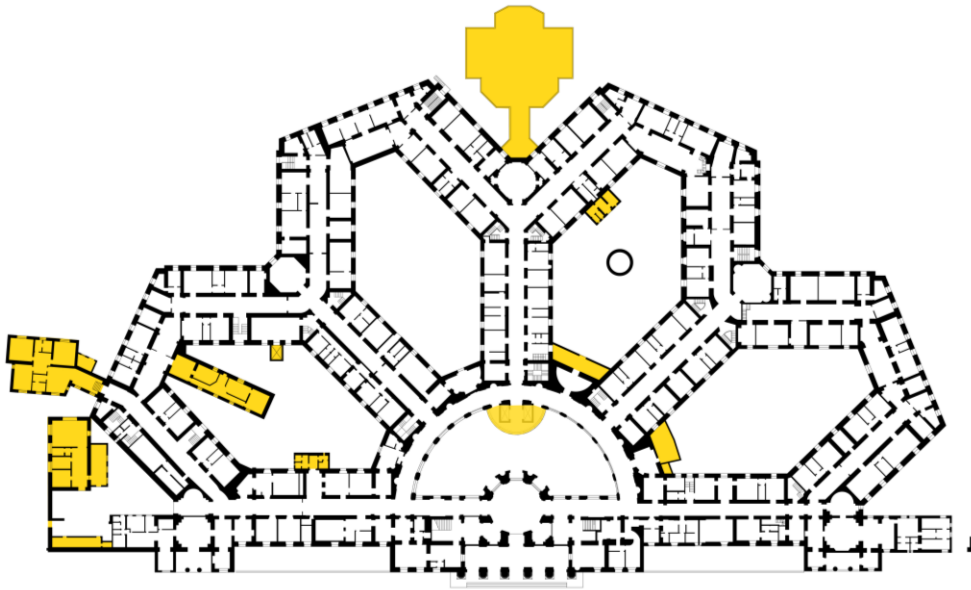
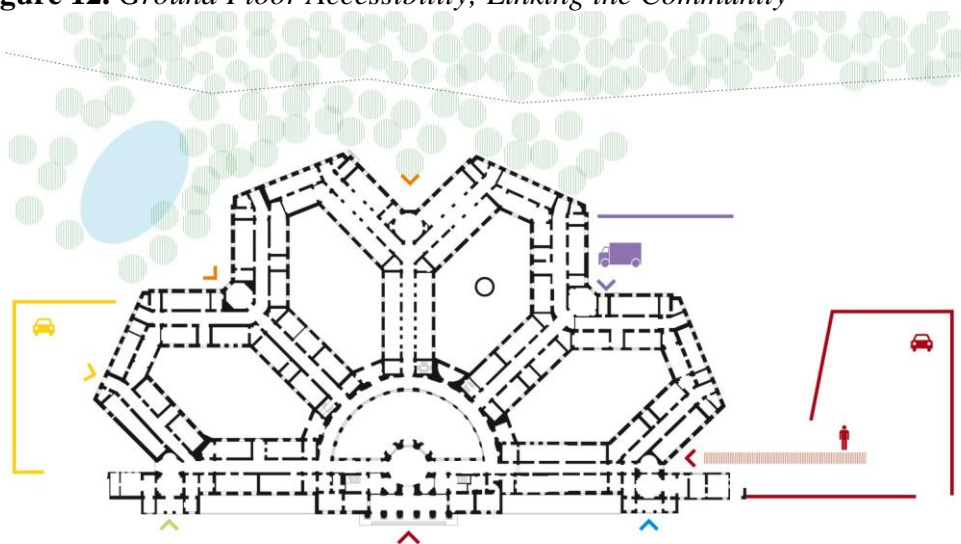


Figure 12. *Ground Floor Accessibility; Linking the Community*



An important aspect of the project is its accessibility (Figure 12). But more than that, the events program area is strategic for creating a link to the community. The educational elements of the functional program will benefit the community and help to integrate the city. People will be able to learn about prevention, maternity, infant and child care, healthy diet, and so on. Also, the cafeteria and retail shops are a key part of the program, offering healthy food in a strategic position near the main entrance paths and the courtyards, by which they link inside with outside and help create a friendly, positive environment.

The connection with the city and the activation of new relationships is one of the key peculiarities of the project. The entire ground floor space has been imagined as an extension of the public space of the city: the cafeteria, courtyards, space for culture, art and education in the interest of a healthy lifestyle are a powerful attraction that can reconnect citizens with the old monument, enhancing the presence and role of the new space for the care of the citizens (Figure 13). The design is oriented to maintain the historic character while also creating a new image, different from a traditional hospital, so that users will be encouraged to enter and feel like home in a relaxed, hospitable environment.

Figure 13. *Adaptive Reuse Scenarios: Ground Floor Spaces and Courtyards are Intended to be Open and Fully Accessible from the External Street*



Conclusions

This research shows how the reuse of abandoned buildings and relatively open spaces constitutes a significant opportunity for achieving more liveable and healthier cities through the regeneration of inner city areas.

Design executes a strategy that combines the needs of reuse and preservation of a historic building of extraordinary value with the objectives of improving the health and quality of inner city life. The design solutions

adopted, which have been tested in the case study of the Ospedale San Giovanni di Dio in Cagliari, tend to elicit the great potential of reuse, in terms of revitalization and improvement of living conditions.

This project enacts its regenerative action considering how the recovery of a historic abandoned building and the beginning of a new regenerative programme contributes to the improvement of the sense of belonging and identity of a community. With this goal, the study has chosen a healthcare function: a new wellness center is conceived as a set of activities aimed at fostering personal well-being, and as a new exciting space capable of encouraging people to meet and enjoy activities, making the *Ospedale* an open facility in close connection with a more liveable and healthy city.

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