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A reactivation project of a district of the historical centre of Genova

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Abstract. Many of the recovery and renovation interventions of the existing heritage conducted today in Europe are the result of urban policies careful to reduce land consumption and improve safety, comfort, and quality according to the needs of users. A substantial historical building heritage characterizes the Italian territory. Historical centres' regeneration is one of the constant and recurring themes of extreme complexity and importance due to the extension, the peculiarities, and the conformation in some cities. The contribution presented deals with the redevelopment and reactivation of a historic district of Genoa, which has one of the largest historical centres in Europe. Innovation, together with the three pillars of sustainability (environmental, social, and economic), are the engines of this pilot project to trigger virtuous processes for the district's reactivation. It is an area of the historic centre with high potential in its proximity to essential activities of the city, the port, and infrastructure. The proposed plan for the regeneration of the area resulted from an in-depth analysis of the territory's state and existing practices and was carried out in close collaboration with the reference bodies and actors involved. This preliminary analysis made it possible to identify the strengths and weaknesses that were the starting point for the pilot project. The article then focuses on two specific aspects. Some of the university's buildings are in the district, and this is the starting strength for creating a "diffuse" university campus with areas to serve students. On the other hand, the open spaces are the point of weakness on which we have worked with outdoor lighting to increase the degree of security of the neighbourhood and enhance the peculiarities and value of existing spaces.

Keywords – District renovation; historic buildings; public spaces reactivation; innovation; sustainability.

1. Introduction

Many of the re-use and renovation interventions of the existing heritage conducted today in Europe result from urban policies based on the fundamental principles of sustainability. These interventions aim to transform the built environment to improve safety, provide new services, and increase comfort and quality of life for users. Building on the built areas also reduces land consumption and preserve and regenerate the built heritage and the memory of places.

A substantial building heritage characterizes the Italian territory, and the theme of the redevelopment of historical centres is one of the constant and recurring themes. It is a topic of extreme complexity and importance that cannot be treated only from one point of view, but it would be appropriate to coordinate and share actions with all stakeholders involved.

In the historical centres are concentrated multiple factors, such as social (depopulation, impoverishment, fragmentation, etc.) or cultural (identity, traditions, memory, etc.) that can become the driving principle for urban regeneration. For this reason, interventions on the historical building



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presuppose a complete knowledge and analysis of the urban environment considered for the identification of its potential and the pursuit of a correct and appropriate strategy of intervention.

2. Prè: a district of the historical centre of Genova

The ancient and complicated history of the city of Genoa is reflected in its urban and architectural structure. Despite the foreign dominations over the centuries, the city has always maintained its artistic and cultural uniqueness. These peculiarities can be read in the labyrinth of streets in the historic centre. The historic centre of Genoa is one of the largest in Europe with its 113 hectares of extension. In 2006, a UNESCO World Heritage Site was declared thanks to the Rolli Route's presence, the old Genoese Renaissance palaces recently restored and brought to new life. The project that is the subject of this contribution is focused on the district of Genoa called Prè, one of the oldest in the city (Figure 1).



Figure 1. Identification of the historical centre of Genoa (in light blue) and the studied district (source: <https://geoportale.regione.liguria.it/>)

The first settlements in Prè date back to the second half of the twelfth century, when outside the old walls of the historic center, began to develop a village along the route of the coastal road. In the period between 1346 and 1358, the walls were enlarged, including also the Prè district.

Since ancient times Via di Prè was a main street, intensely trafficked and closely linked to maritime activities. The new station of Genoa Piazza Principe, realized between 1854 and 1860, profoundly modified the north-western area of the district. In the 20th century, urban reorganization continued with more demolitions in the station area to make room for large hotels, some of which are still in operation. However, after the Second World War and in economic boom years, the district was also an ideal place for micro-criminality given its characteristics.

Today the district is surrounded by important and high traffic roads, such as Via Gramsci, Via Balbi, the elevated railway, and the Piazza Principe junction. Moreover, the district is located directly behind the Porto Antico (Old Port), a hub of the Genoese tourism for several places of interest, requalified since the "Colombiadi" Events in 1992.

The state of art analysis has allowed us to study the area in detail and bring out the strengths and weaknesses summarized below.

2.1. Strengths of the district

The strengths of the area that emerged from the analysis are many. First and foremost is the presence of various destinations and points of interest (museums, historic buildings, churches, etc.) capable of generating a flow of people in the neighbourhood (Figure 2). In addition to citizens, the proximity to the railway station or the maritime station allows attracting tourists who arrived in Genoa through these two lines of connection. Besides, there are also connections with the rest of the city through public transport: the area is served on all four sides by urban bus lines, and there are two metro stops. Public transportation service is a significant strength because there is a total absence of vehicular traffic within the neighbourhood due to the limited traffic zone regime, and there is a limited amount of parking available in and around the area.

During the day, the district is intensely lived by residents and by many young people due to several college campuses' presence. Students have enriched the urban fabric of meeting points and commerce to serve university students' needs (bars, restaurants, libraries, copy shops, bookstores, etc.).

Finally, another strong point lies in the urban fabric of the district. First, the many alleys present allow a good capillarity of communication routes. The historical buildings have a qualitative potential safeguarded by the presence of numerous punctual architectural constraints. They define the area of great cultural, historical, and architectural interest and subject it to the municipal administration and agencies' protection and interest.



Figure 2. Detail of the Prè district with the indication of the main streets and the building uses (source: authors)

2.2. Weaknesses of the district

Similar to multiple strengths, there are also several weaknesses found. Some of them can be found concerning the area orography (ascending from the sea) and the streets' texture. The high slope represents a disincentive to travel some constraints that cross the neighbourhood vertically and connect the area's two main arteries (Figure 3 and Figure 4). Moreover, even during the day, the narrowest and darkest paths are less frequented, inevitably leading to a negative perception of the area. The poor lighting in the inner streets and squares accentuates the sense of insecurity and leads to almost absent night flows in this area, except for residents or those who use the restaurants and accommodation activities present.

The area is characterized by a high housing density with closely spaced buildings that do not receive enough light during daylight hours on the lower floors (Figure 5). There are multiple streets in the neighborhood that are very narrow, challenging to control, and do not allow all vehicles to act for waste collection or street cleaning.

Finally, in this peculiar urban fabric, green areas find a difficult collocation and, even where they have been able to conquer space, they result not very visible and consequently not very frequented and of modest quality. Some green areas of great value, such as, for example, the garden of the Prince's Palace and the courtyards of the Royal Palace, are not directly usable by citizens.



Figure 3. View of the central street "Via Prè" (source: authors)



Figure 4. View of one of the streets that crosses the area vertically (source: authors)



Figure 5. Bottom view of the space between the buildings (source: authors)

3. The Reactivation Project

The reactivation proposals for the Pré district are the result of the analysis carried out and the suggestions provided by the strengths and weaknesses. Moreover, they result from the methodology based on the principles of sustainability and innovation, indispensable "allies" - also according to the European Union - that allow finding realistic and potential solutions to realize the sustainable cities of the near future.

The reactivation project consists of multiple actions that aim to create new opportunities and develop and enhance residence, leisure, tourism, and cultural uses. It can be done by creating poles of attraction that reactivate the neighbourhood and are the engine to minimize the existing weaknesses related to the area's usability, the perception of low security of the area, and enhancement of open spaces.

In this paper, we want to report the results obtained from two points found by the analysis: the presence of some seats of the university (strength point) and the low lighting and use of the squares in the area (weakness point).

The identified project area is the first portion of the district to the south-east (Figure 6) enclosed above and below, respectively, by Via Balbi and Via Antonio Gramsci. The south-eastern boundary is

constituted by Via delle Fontane, which leads to Piazza della Nunziata, a meeting point for residents of the area, students, and tourists visiting the city. The area is characterized by a lack of homogeneity between the upper and lower portions but has excellent development potential despite this situation. Starting from the strength given that in this portion of the district, there is the headquarters of the didactic pole of Foreign Languages and Literature of the University, it was decided to create a student residence in municipal property premises (Figure 7). The design proposal also concerns the outdoor spaces adjacent to the buildings identified to reactive them and make them usable and safe even at night through a new lighting system (Figure 8).

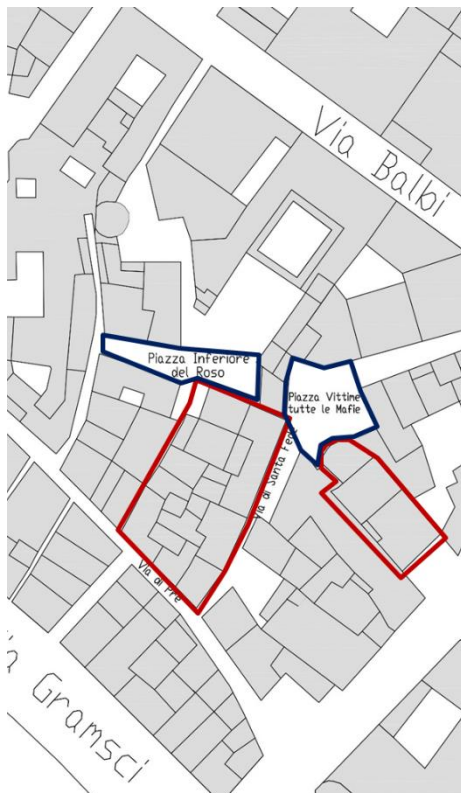


Figure 6. Location of buildings (in red) and squares (in blue) involved in the reactivation project. (source: authors)



Figure 7. View of the two identified buildings (source: authors)



Figure 8. View of the two adjacent squares (source: authors)

The intervention foreseen in the identified buildings consists of restructuring and reorganizing the internal spaces to create new university residence environments. Specifically, it is expected to realize the accommodation thanks to the merger of several housing units owned by the municipality in the group of buildings between the two squares. The other building, currently used as a gymnasium, is planned to create a multifunctional space used by students as a meeting place, study, and canteen area.

These design hypotheses have been studied through a detailed analysis of the area through inspections and field activities to view the areas involved, collect photographic documentation, and detect the buildings detailed characteristics. The information collected was then used to define the buildings actual state and simulate the performance using simulation tools. Specifically, we have focused on two aspects. First, it has been studied the solar radiation that arrives on the surface of the building envelope. As mentioned above, the historic center buildings are poorly illuminated, which affects the comfort of these apartments, especially those on low floors. Then we also focused on the simulation of the energy performance of the building. Buildings consist of uninsulated stone masonry (average transmittance value $U = 1,366 \text{ W/m}^2\text{K}$), wood floors (average transmittance value $U = 1,879 \text{ W/m}^2\text{K}$), and uninsulated slate roofing (average transmittance value $U = 2,091 \text{ W/m}^2\text{K}$). Some windows

have been replaced with PVC frames and double glazing (average transmittance value $U = 2,873 \text{ W/m}^2\text{K}$), while others are still in wood and single glazing (average transmittance value $U = 4,314 \text{ W/m}^2\text{K}$). The energy simulation has shown that the dwelling analysed are in class G with an average global performance index greater than 200 kWh/m^2 per year. Therefore, some interventions to improve the global energy performance have been suggested due to none of the building envelope elements has thermal transmittance values following the legislative requirements. In particular:

- internal insulation of vertical walls to achieve $U_{\text{lim}} = 0,34 \text{ W/m}^2\text{K}$;
- replacement of windows and doors to achieve $U_{\text{lim}} = 2,00 \text{ W/m}^2\text{K}$;
- insulation of the roof from the internal inside to achieve $U_{\text{lim}} = 0,30 \text{ W/m}^2\text{K}$;
- replacement of the generation systems for heating and hot water;
- replacement of the regulation systems inside the thermal zones.

The distributive reorganization of the internal spaces had as objective to realize spaces hosting the highest possible number of student places, respecting the minimum dimensional standards provided by decree 936 of 2016. In student residences, the coexistence of residential functions and related services must be guaranteed to meet individual and social needs. The standard requires that the net area to be used for residential functions must be $\geq 12.5 \text{ m}^2$ for single rooms or 9.5 m^2 for double rooms (including bathrooms). The net area to be used for service functions must be $\geq 5.0 \text{ m}^2/\text{person}$ for all types and must include cultural, educational, recreational and support services. Within the area standard for service functions, a minimum area of $2.0 \text{ m}^2/\text{person}$ must be guaranteed for cultural, educational, and recreational services.

The new university residence is characterized, on the ground floor, by a space for aggregation and meeting, while on the upper floors, each apartment is equipped with single and double rooms with communicating or private bathrooms, counting a total of 50 beds.

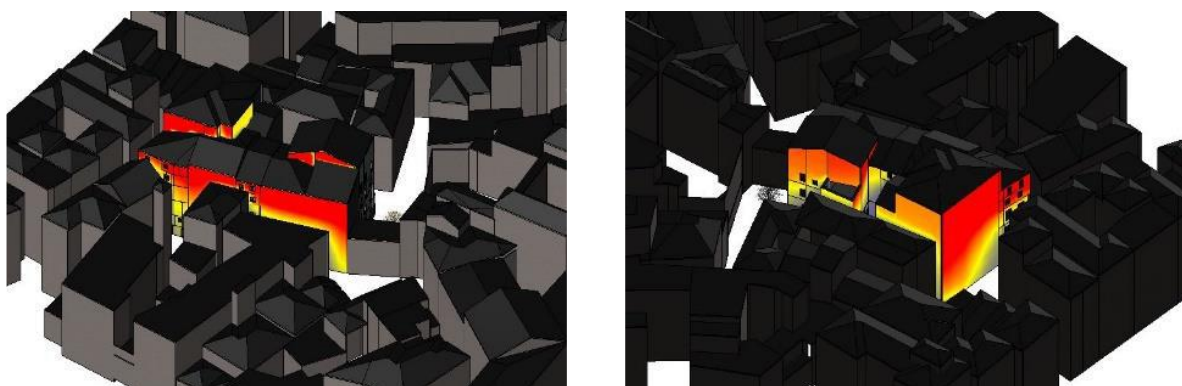


Figure 9. View from East and West of the analysis of solar radiation on the walls (source: authors)

The two squares' lighting design aims to create safe and pleasant places even during the night without bothering residents with new lighting systems.

Two different types of lighting have been planned: service lighting (Figure 10), which is the one that guarantees the right portion of the light to the square, and architectural lighting (Figure 11), which is the one that highlights the facades of the buildings that overlook the square and that, for whatever reason, have been chosen to be highlighted. In the Prè district in general and the two squares specifically, architectural lighting can bring out the artistic peculiarities of the historical fabric by emphasizing the shapes of buildings and highlighting decorative elements.

First, therefore, service lighting has been provided for both squares to increase the sense of safety. New LED light points have been positioned to replace the existing streetlights consisting of fixtures that do not emit upward light flow following the most restrictive rules against light pollution and ensure comfort inside the apartments overlooking the square during the night hours.

Concerning the lighting of the facades, a study was first carried out on what deserved to be highlighted in the two squares. It was then decided to use only points of light applicable from above, as these are less prone to vandalism than those positioned from the ground.

In Piazza Vittime di tutte le Mafie (Victims of all the Mafias Square), it was wanted to highlight:

- the circular part of the former oratory of San Tommaso that will become the multifunctional building serving the widespread campus, highlighting its geometries;
- the building located in front that houses the university buildings, part of the building of “Rolli’s system”.

In Piazza Inferiore del Roso (Inferior Square), the buildings overlooking the square are mostly residential, so it was not planned to illuminate the facades to disturb those who live inside. The only element highlighted is a statue placed inside the wall that is part of the back of the University building, also one of the historical buildings of the “Rolli’s system”.

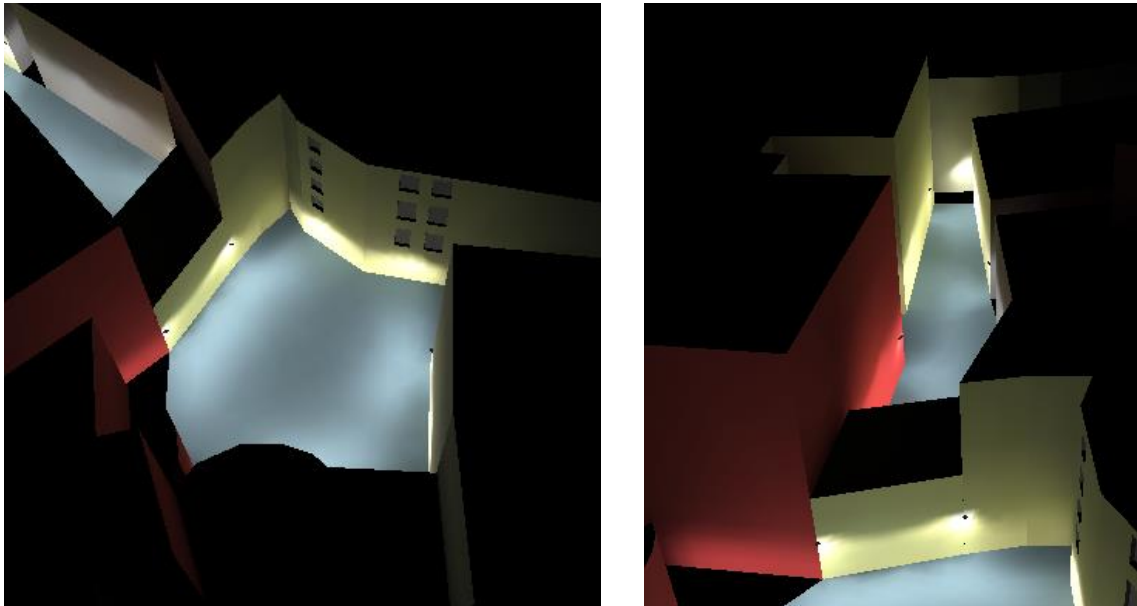


Figure 10. Simulation of the proposed new square service lighting system. (source: authors)

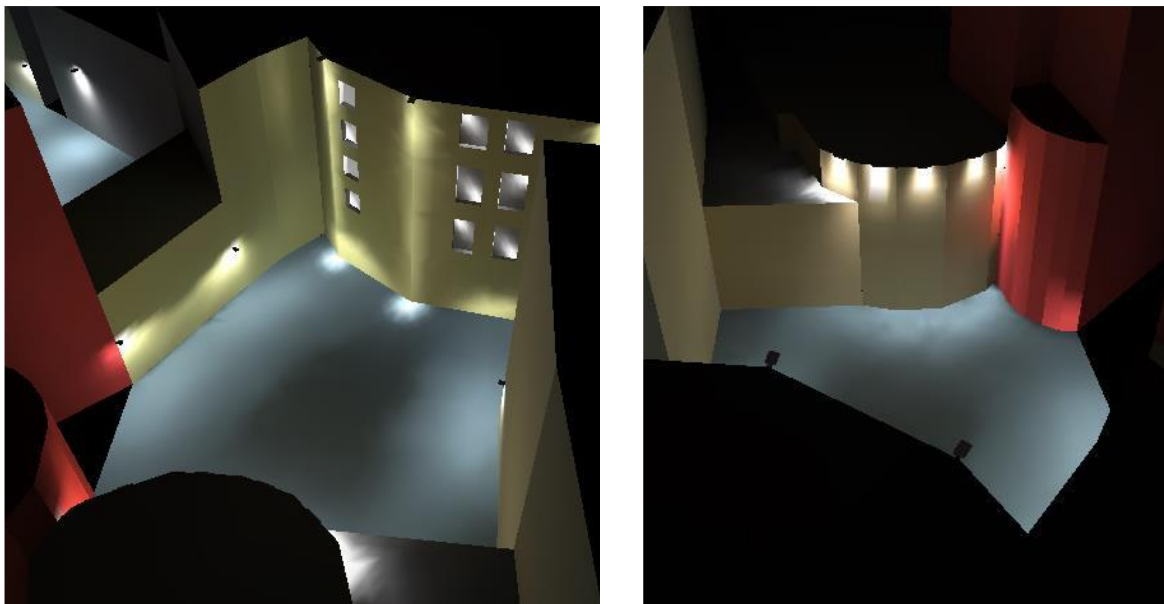


Figure 11. Simulation of the proposed new square architectural lighting system. (source: authors)

4. Conclusions

The renovation and reuse of the existing heritage are constant and recurring themes in current European and national policies, given the substantial building heritage. It is a theme of extreme complexity and

importance that cannot be treated from a single point of view, but it would be appropriate to coordinate actions and share with all the actors involved.

The proposal presented regarding the project for the reactivation of a neighborhood in Genoa is the result of a long and detailed analysis. The analysis identified strengths and weaknesses that were the starting points for multiple ideas to enhance the area. The study presents two possible actions starting from several university buildings located in the area and the need to increase night lighting in the district's street and squares.

The presented study is an example of what can be achieved. It can be extended to the entire area, including the Prè district. The illumination project would allow to guarantee greater accessibility and a sense of security during the night in the first place for the residents of the area and hopefully also for tourists and occasional users. It is also carried out a study on the usable area of the municipality properties to develop the widespread university campus. This estimates the possibility of giving accommodation to about 280 students and offering about 3000 square meters of space for all services required. Such as the historic center of Genoa, the presence of the University takes on great importance, constituting a resource not only economical for the presence of thousands of students but also in terms of possible urban regeneration of places.

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