

Regeneration 4.0: Public Space and Quality of Living in the Fragile Territories of Contemporaneity

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Abstract:

The central theme of this project is the study of urban regeneration in the city of Barcelona. It is a subject of considerable complexity, relevance, and research significance. When it situates in a city with a strong historical background and design tradition, the design factors will be even more diverse. For example, geography, urban history, cultural context, political tradition, social organization, urban fabric, and institutional networks of infrastructure. This makes it a rather challenging subject.

The city involved in this project, Barcelona, is a world-famous Mediterranean portal city and a representative of the Spanish national landscape. But on the other hand, it also has a strong Catalan local character. Even its conflict with the mainstream Spanish tradition has left a deep mark on the history of its urban development. The central part of the Barcelona metropolitan area is located on the coastal plain enclosed by the rivers El Llobregat, Besòs and Collserola, and is characterized by the maritime civilization of the port city, but also by a strong agricultural tradition. After a centuries-long history of restricted development, Cerdà's revolutionary urban regeneration program made Barcelona a model of modern urban norms. Subsequently, various urban regenerations and renovation strategies have been developed, which have placed greater demands on our understanding of the city of Barcelona.

The basic urban fabric of Barcelona is laid out in the grid of Cerdà, with the Plaça de les Glòries Catalanes as the core of several main roads that indicate the direction of the city's pattern of extension and divide it into different functional blocks. Regardless of the strategy adopted for the urban regeneration of the latter cities, Cerdà's main philosophy of "returning urban space to the public" was implemented at that time.

The site we aim to transform is the northeast corner of Barcelona, in the La Segrega area, between the lively and crowded Sant Andreu area and the Besòs River. A former industrial area, it is now crossed by a major railroad line and will have a new high-speed rail station. This will completely change the whole structure of the area and challenge the urban regeneration of the site. It is a place where the grid logic of Cerdà meets the spatial logic of the suburban space of Sant Andreu, with a large number of industrial areas and tightly planned dense neighborhoods. We wanted the new regeneration project to connect La Segrera linear park with the green space that extends along the

Besòs River. It will pass on the industrial heritage while better serving the residents and visitors to the area. As an important project adjacent to the high-speed rail station, it will serve as a portal for many travelers to Barcelona and even to Spain.

In this design, we will sort out the intertwined relationship between the two urban fabrics from Cerdà and Sant Andreu, using the classic Cerdà module for zoning and planning, linking the station, the park, the river and other urban transportation hubs through axes and other linear spatial elements. Theater, museum, inhabitant complex, recycling center and vertical farm are unified in a single campus, offer more opportunities to the public and the city.

Regeneration:

1. Definition:

Urban Regeneration, sometimes referred to as urban renewal, is customarily referred to as Urban redevelopment in the United States and is primarily an expression of the reappraisal and development of land for use. Urban planners hope to address urban decay in this way, and in recent projects it has often been used with the multiple visions of welcoming more outside settlers, stimulating investment, encouraging business, boosting the economic vitality of the area, and cleaning up security. As a result, the most common regeneration projects often focus on slums or abandoned industrial zones in a given area. These initiatives also often lead to debates about urban inequality, marginalized groups, low-income populations, and housing tenure rates.

2. Historical background.

Regeneration as a new subject first appeared in developed countries in the 19th century. During this period, countries in Europe and the United States, which had completed the industrial revolution, continued to resolve the conflict between traditional urban patterns and modern industrial production. At the same time, the pollution brought by industrialization seriously damaged the urban environment and caused the deterioration of the urban environment per capita. This led people to reflect on the relationship between urban life and idyllic life, while calling for a new kind of urban civilization. In this context, Ebenezer Howard, an Englishman, proposed a direction to answer the urban problems at the beginning of the industrial revolution. In his book "Garden Cities of To-morrow" published in 1898, he hoped that the ideal city to be built in the future would have the advantages of both city and countryside, which he called "garden city", combining the employment opportunities and good municipal facilities of the city with a good view of the countryside, and the city pattern would be circular. The city was laid out in layers, with large parks and public buildings in the center and residential buildings, factories, and warehouses in the outer layers.

In 1811, the famous Manhattan City Plan was introduced in New York City, USA. The New York Planning Commission considered that the city's focus

should be on convenience, comfort, accessibility and adequate functionality. Therefore, the city was laid out in a purely square grid layout, which was very different from that of continental Europe. The aim was to maximize the commercial value of the land and to rapidly develop and utilize the land. In this plan, communal land was seen as a waste of resources. The quality of life of the general citizen was not a priority currently.

In the 1850s, France launched the famous Baron Georges-Eugène Haussmann plan for the transformation of Paris. An important political project of the Second French Empire, Haussmann's plan was not only aimed at eliminating the traditional urban issues of Paris' congestion, squalor, and darkness, but also at meeting the Empire's political need for a splendid and spectacular imperial capital and eliminating the risk of civil uprisings. Haussmann's plan expanded the area of the city, built new sewerage and water systems, and planned a three-level road network that would allow the new Paris to adapt to the productive life patterns of the industrial age. But at the same time, its too bold and direct road planning severely damaged the crude urban fabric of the old Parisian city, compromising the city's history, and mixing the old and new transportation systems, which in turn affected the efficiency of urban transportation. In terms of functional planning, factories and workers' residences were moved out of the city center.

Haussmann's plan was an innovation in modern urban renewal and provided a good model for modern urban planners, but it also had significant political limitations.

3. Pros, Cons and Debates

While regeneration is one of the major topics facing recent architecture as well as urban design, and a variety of different urban renewal projects have emerged, it is clear that not all of them have been successful. Its negative effects and the mythical nightingale poignancy that drives urban renewal are widely debated and even criticized. Proponents often see regeneration as an engine to drive urban economic development and an opportunity for social change. Critics, on the other hand, see regeneration as a mechanism for control and domination of society. The core of the controversy is often related to the use of eminent domain, the alteration or demolition of historical heritage, and the displacement of people as a result of slum upgrading. Social structures and legal systems need to provide more rational explanations and assistance for renovation and demolition.

As the 20th century progressed, urban renewal projects failed in many countries, including the United States. In the United States, some seemingly successful urban renewal projects have preferred to revitalize a particular area, but have failed to successfully revitalize entire cities, with low-income residents at risk of displacement in the process. Many commercial renovation projects are often accompanied by increased urban gentrification and inequality, and problems such as short-sightedness revealed in capital-driven renovation

projects often exacerbate urban ills. At times, slum-cleaning operations have appeared to be very effective but have not solved the social problems that created the slums.

With the publication of Jane Jacobs' 1961 book *The Death and Life of Great American Cities*, a wave of criticism of contemporary large-scale urban renewal began to emerge, and people began to reflect on the fairness of compensation for demolition issues in renovation. And the authorization and planning of reopening land in the process of operation has likewise sparked controversy. Therefore, in this new era, how to conduct controlled, reasonable, and win-win urban renewal and bring about new lifestyles will be one of the significant challenges for the discipline in the future.

Introduction to Barcelona: History of the city

D.C. 200: After the Roman victory over the Carthaginians, a colonial military town was set up in the area, named *Barcino*, a typical Roman garrison city, the main body of which consisted of two intersecting main roads, one long and one short, forming an oval-shaped urban area, with a central square at the crossroads of bananas, which continues today as *Plaça Sant Jaume*. This area is the prototype of the *ciutat vella* of D.C. 1300: In the 9th century A.D., Charlemagne created the title of Count of Barcelona. Since then, Christian civilization has steadily become the mainstay of the city. In the 12th century, Barcelona joined the Kingdom of Aragon and for the first time the city was linked to the rest of the Iberian Peninsula. With the development of shipping and handicrafts, Barcelona became one of the trading centers of the Mediterranean. The city area expanded rapidly and formed a pattern of proximity to the port. By 1330, the city covered an area of 240 hectares and had a population of nearly 48,000.

D.C. 1859: As religion, art, and commerce continued to flourish, a new city was built on the west side of the old town, leaving numerous Gothic buildings for *ciutat vella* during this period. But with Barcelona's bad political decisions during the War of the Spanish Succession, it was stripped of its urban autonomy at the end of the war, and the city's development was strictly limited to the surveillance of the city walls and castle. Up to 1859, the contradiction between the overcrowded and dirty urban environment and the strictly limited borders of the city was extremely acute, and the poor social environment had a serious impact on the city's commercial activity and economic level. At the same time, the hatred of the citizens towards the authorities had reached the edge of intolerability. At this time, Barcelona continued a revolutionary urban transformation.

D.C. 1890: In 1859 Cerda won the competition for the urban development of Barcelona, which rejected the traditional baroque urban design of the elite and instead promoted a modern, egalitarian, and enlightened city. He placed a large undifferentiated grid of urban blocks between the old city of the past and the villages and towns on the outskirts of the city, with community units with

extensive courtyards within each grid. Corners were cut at road intersections so that the community units formed octagonal shapes, providing space for small squares where the roads crossed and increasing the amount of critical area with commercial value. By 1890, Cerda's plan was beginning to bear fruit. The new part of the city showed a very different urban appearance from that of ciutat vella.

D.C. 1956: From 1900 to 1930, the population of Barcelona increased from 500,000 to 1 million. Industrial growth and mass immigration boomed the city, but also increased social inequality and the spread of slums. With the Spanish Civil War that followed, the economy struggled to recover for a long time, and only in 1953 did it begin to improve. Widespread housing needs became a primary concern, and new residential areas began to be built in the east, while the population density of the city increased. The spacious and open urban space originally envisioned by Cerda was ultimately not completed.

D.C. 1992: Spain emerged from Franco's dictatorship with high hopes for a new city. By this time, all of Cerda's originally planned urban areas had been built. The ring road and the waterfront were also the focus of the city's renovation in anticipation of the 1992 Olympic Games.

D.C. 2010: At the beginning of the 21st century, Barcelona entered a period of confusion and chaos due to the economic crisis and the changing market landscape in a globalized economy, and many urban renewal projects were not well received by the citizens. However, towards the end of the first decade, a massive urban intervention policy was relaunched, focusing on the areas of Plaça de les Glòries Catalanes, the Besos River, and Sant Andreu.

The historical regeneration of Barcelona and its future

Cerda's urban regeneration plan: In 1859 Barcelona organized an urban development planning competition, and the two main competing proposals were proposed by Antoni Rovira i Trias and Ildefons Cerda, respectively. The former proposed a plan that fully respected the old city fabric, with the old city as the core and a radioactive urban area arranged outwards, with the intention of recreating the glory of the Catalan Middle Ages. Such a plan would design the new Barcelona as a baroque city similar to Rome or Paris. Cerda's proposal, on the other hand, promotes a modern, egalitarian and enlightened city. Residents of all classes and sectors should enjoy the same quality of urban space. Thus, he sets up a large network of undifferentiated city blocks, without any connection to the fabric of the old city. Obviously, the former proposal was appreciated by the Catalan elite, but a year later, Cerda's proposal was supported by the Spanish central government from Madrid and was finally implemented. The central government wanted to curry favor with the general public and to suppress the power of the Catalan elite.

Cerda began by introducing a metropolitan plan. The new district he planned occupied the entire plain, incorporating several small municipalities. The entire old town was preserved almost intact. The entire plain was covered by his 113-

meter grid system. The square community cells are divided by 20-meter-wide streets, with each intersection chamfered to facilitate vehicle turns, creating numerous miniature squares and extending the area along the streets with commercial value. The interior of the community units are wide and open courtyards, with the ground floor of the buildings elevated, allowing public spaces to be interconnected, providing a rural setting for urban residents. The grid system of the entire extension is defined by several main roads of 50 meters wide, interspersed with large gardens and urban squares, a new type of city and lifestyle that is modern, efficient, open and fair, as Cerda intended in this proposal.

Cerda's plan quickly became a huge sensation in Spain, and many urban regeneration projects were influenced by it. The 1860 plan for Madrid, for example, used a similar large grid of squares. Valencia's plan in 1884 showed an even more pronounced influence. The rectangular grid with the cut corners of the intersections makes for octagonal community units as in Cerda's scheme. This case is like the urban renewal plans of Palma and Bilbao.

- 1992: In anticipation of the 1992 Olympic Games, Barcelona concentrated on the construction of the Olympic Port and the waterfront area, where stadium facilities, gardens and urban transport networks were built to give the city a whole new look. According to the locals, the economic development was 20 years ahead of normal. The 1992 Olympic Games were a good example of how the city could be transformed by international events.

- 2004: Fórum Universal de las Culturas 2004 was a 141-day international event held at the Centro de Convenciones Internacional de Barcelona (CCIB) and its surroundings, from May 9 to September 26, 2004, in Barcelona, Spain, as the first Universal Forum of Cultures. The open space used for the event is now a park called Parc del Fòrum. Unfortunately, the program did not achieve the same level of popular support and success in the urban planning sense as the urban renewal program for the 1992 Olympic Games. The fundamental reason was the lack of control of the city as a whole, but rather the focus on a specific area of the waterfront, leaving the new project disconnected from other important landmarks and the historical trajectory of the city.

- Superblock: Cities around the world have taken inspiration from Barcelona's "superblock" concept. Superblocks are small clusters of internal streets called green streets that are closed to traffic. Vehicles are mainly used for residential access, public transportation, disabled people, emergency vehicles and bicycles for recreational purposes only. It is part of a global best practice for two reasons: a) prioritizing people over cars and focusing on accessibility, and b) following the community engagement rulebook. The "superblock" is a 400 x 400 m unit - larger than a block, but smaller than an entire neighborhood. Through the urban design concept described above, the city aims to restore space for communities, improve biodiversity, move toward sustainable mobility, and encourage social cohesion. Barcelona launched its first superblock in 1993

in the historic district of El Born, near the Basilica of the Virgin Mary, and in 2005, two more superblocks were planned for Gràcia. The pilot project was launched in 2014 and saw a 10% increase in walking trips, with 2,01,843 annual trips. Cyclists have also increased by 30%. Since 2016, Barcelona has been working to implement six fully functional superblocks in the city. The city is conducting pilots in six neighborhoods at appropriate intervals to better refine the public participation process. In any case, it is commendable to put people at the center of all decisions.

- 2024 Urban Mobility Plan: The travel habits developed over the past 50 years are evolving into new ways of traveling. For this reason, Barcelona is restructuring its urban space to guarantee a more equitable distribution of space between the various modes of transport, opening space for bicycles, improving the bus network, giving priority to walking trips, widening sidewalks and providing comfort and safety on peaceful streets. The City of Barcelona has developed the Urban Mobility Plan 2013-2018 (PMU) as a planning tool that sets out a course of action to manage urban mobility in the coming years. It is set as a strategic vision to continue the progress towards a more sustainable, efficient, safe, healthy, and equitable collective mobility model. The plan identifies the necessary objectives and actions to ensure that the different modes of transportation and the people who use them can coexist on public highways, prioritize, and protect pedestrians and cyclists, promote public transportation, reduce the use of private cars, commercialize, and regulate tourism trips, and guarantee the overall efficiency of the travel network.

- La Segrera a new green diagonal axis extends into the heart of 21st century Barcelona. This natural path for pedestrians and bicyclists opens a new era of a greener and more livable metropolis that is in direct contact with the natural environment. The initiative is key to improving biodiversity and creating a stronger urban ecological role in the city. This green track enters the city through the natural valley of Besós, finding continuity in the new Cami Comtal Park or La Segrera Linear Park. A generous way of shading for pedestrians, bicyclists and skaters who will discover different environments through the Sant Andreu and Sant Marti neighborhoods, El Clot Park, the historic gardens of Ciutadella and finally to the sea.

Conclusion

In summary, in response to the new crisis and challenges of the Barcelona city, this project aims to use the former industrial heritage to build a new urban landmark in La Segrera, including a train station, a theater, a museum, a recycling center, a vertical farm, and a residential complex, and to achieve the goal of urban regeneration. After the previous analysis, we have been able to create an urban regeneration project that is more in line with the new era, based on the richness of the urban fabric and traces left by the city itself, and on the inheritance of the urban spirit laid down by Cerda. In summary, the layout of the project will draw on the "connection from the mountain to the sea" that is

created throughout the city, using axes and linear public space planning to integrate greenery and shared spaces into the overall urban system, functioning as a unified whole. In terms of spatial scale, the classical grid of Cerda is used as a unit to rationally divide the building volumes, and to reconcile the scale of the train station, city park, industry, and residential areas according to the project's surroundings. In the shaping of public space, the focus is on expressing the concept of opening spaces to citizens, being pedestrian and bicycle friendly, encouraging communication, participation and sharing, and making parks and squares the living rooms of the whole city. In the shaping of architectural spaces, the focus is on the expression of a sense of scale, combining classic Barcelona spatial elements with the framed structure of industrial heritage, respecting, and making full use of the surrounding environment and landscape, and opening public buildings to the public.