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# Urban Squares Renewal in Promoting Sustainable Urban Prosperity and Low-carbon Transformation: Evidence from Comparisons between Piazzale Loreto and Wujiaochang

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**Abstract:** European squares have represented the heritage of the European excellence and culture since ancient times. In 2026, Milan Piazzale Loreto will be transformed into one of the most important green squares in Milan. China's urbanization is proceeding at an unprecedented speed, and Shanghai, in particular, has rich and valuable practices in urban renewal. However, there are few comparative studies on the renewal projects of large city squares in Milan and Shanghai. Therefore, this article explores the importance of renewal projects of large city squares by comparatively analyzing the similarities and differences between Milan Piazzale Loreto and Shanghai Wujiaochang. The evidence of the study suggests that the renewal projects of large city squares have great influence on promoting sustainable urban prosperity and low-carbon transformation.
**Keywords:** Urban squares renewal; Milan Piazzale Loreto; Shanghai Wujiaochang; Sustainable urban prosperity; Low-carbon transformation

## 1. Introduction

The city center square of the ancient Greek city-state, namely the municipal square, was the center of social and political activities of the city-state [1]. Nowadays, the square becomes the identification of the heart of the public space [2]. As a part of the road, the square is a place where people and vehicles pass and stay, and plays the role of meeting,

buffering and organizing traffic. In many cases, the important traffic intersections gathered around the square in a city are important inasmuch as they are the main roads connecting the city in all directions and the only way to connect the city with other cities. They usually have the main feature of a large traffic flow and steam of people. Undoubtedly, the orderliness of important traffic intersections in a city is not only a manifestation of the management level of the city, but also indirectly and powerfully maps out the degree of civilization and development potential of the city. Therefore, the regeneration of these large squares with an important geographical location are of great significance to the urban development. Through a comparative analysis of Piazza Loreto, located in the northeast corner of Milan's city center, and Shanghai Wujiaochang, also located in the northeast of Shanghai, this article studies the important value of the large city squares in promoting the sustainable and prosperous development of cities from specific practical cases.

This article is defined as follows: Literature review is carried out in Section 2. The research method is described in Section 3. The comparison analysis is conducted in Sections 4 and 5. Then the research results and the discussion are included in Section 6. Finally, conclusions are presented in Section 7.

## 2. Literature Review

The world has been accelerated by urbanization rapidly especially in recent decades. According to the World Bank's statistic, the world's urbanization rate was 56% in 2021, while the level of urbanization in Italy reached 71% [3]. It is agreed that Italy has witnessed widespread urbanisations. International experience shows that when the urbanization rate reached 60%, various urban problems began to emerge from this critical period and will gradually intensify. To be specific, in the process of intensified urbanization, a series of problems have arisen, such as: poor living conditions, traffic congestion, air pollution, urban environmental noise pollution, and environmental quality decline. In compliance with United Nations Framework Convention on Climate Change and the Paris Agreement, governments have set long-term goals to reduce global carbon emissions and battle against climate change [4]. They have caused a turning point in the historical development of mankind. Moreover, the European Green Deal strategy was unveiled in 2019 [5]. It has reflected the determination of the European Commission to take bold action to promote the process of social decarbonization which will cause the urban citizen's living environment to experience significant changes. The road to global green and low-carbon transformation leads the forerunners to compete to establish a leading pattern of sustainable urban renewal [6]. In recent years, both the European Union and China have been committed to practical actions especially in the field of urban regeneration based on the guiding principle of sustainability and low carbon in order to further vigorously promote the comprehensive green transformation of economic and social development [7-27]. There are many urban renewal case studies; however, there are few comparative analyzes of urban renewal cases between Milan and Shanghai, which have been sister cities since 1979 with close cooperation in various fields. In the context of global sustainable development and low-carbon strategies, this article is carried out to exam the similarities and differences of the two cases to understand the huge impact of the renewal projects of large city squares on promoting sustainable urban prosperity and low-carbon transformation.

## 3. Method

The famous urban planning project of Shanghai Wujiaochang located in the northeast corner of Shanghai. Wujiaochang area is very characteristic. It used to be the intersection point of the main traffic roads in the "Great Shanghai Plan", the earliest, largest and most comprehensive urban development master plan in Shanghai's history. So far, Wujiaochang has undergone several transformations and has become one of the most prosperous areas in Shanghai today which is named as "Wujiaochang Sub-center in Shanghai" [21]. While the Milan Piazzale Loreto is a major city square in the north-eastern part of Milan and the reinventing project "Milan LOC" is with the aim of transforming Piazzale Loreto into a new urban landmark. Milan and Shanghai have maintained friendly exchanges, aiming to jointly promote economic growth and mutual benefit through the development of international cooperation [28]. The two cities in terms of the city's land dimension, urban population and GDP are not at the same level, however, there is a close relationship between them detailed in following main aspects: Firstly, the two are sister cities that established friendly

relations by catching the last train of the slowed acceleration of the sister city movement between the years 1970 and 1979 [29]. Secondly, they are the largest cities and the most important economic centers of their respective countries. Thirdly, the two renewal projects are respectively located in the northeast of the two cities and have extremely important geopolitical attributes. Ultimately, both projects aim to alleviate traffic pressure in the region and make urban development more sustainable. Therefore, the comparison method is carried out in the analysis of projects between Milan LOC and Shanghai Wujiaochang. The research framework of this article is briefly summarized as follows (**Figure 1**).

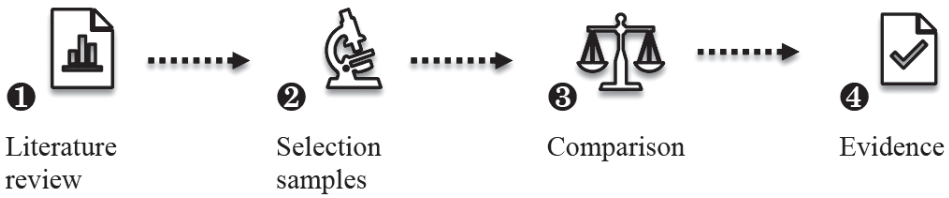


**Figure 1**: Research framework

Source: Authors' elaboration

## 4. The Case of Milan LOC

In 11 May 2021, the Municipality of Milan announced the transformation of the city's most chaotic transport hub into a large green area that connects the major roads - Corso Buenos Aires, via Padova, viale Abruzzo, viale Brianza, viale Monza, via Andrea Costa, via Nicola Antonio Porpora. The transformation of Piazza Loreto into a new logo will be carried out also for the Milan 2026 Olympic Games. It is the revolution of the LOC, Open Communities of Loreto, the second edition of the winning project Reinventing the City, which is an international appeal launched by the Municipality together with C40, which regulates the ownership of surfaces alienated or used for sustainable urban regeneration projects (Comune.milano.it, 2021) [30]. On January 17, 2023 at 12:00, the public presentation of the Loreto Open Community project took place at the LOC 2026 space [31]. The representatives of Municipalities 2-3 and Nhood Italy (the company that won the tender) gave the presentation of the project. The name of the call is called "C40's Reinventing Cities". The project's intervention category is environmental design. The design will lead by Metrogramma Milan. Andrea Boschetti (Design & Founder Partner of METROGRAMMA) acts as coordinator of the LOC Design Alliance. The investment, worth 80 million on an area of around 9200 m², will transform the chaotic road junction into a green square, with pedestrian and cycle paths, services, public spaces [31]. More than 300 tall trees will be transplanted here to absorb carbon dioxide and reduce the heat island effect in the city center, as well as optimize energy consumption for the environmental concerns. In the meantime, the project will put into use solar panels with an area of about 1200 m². Humanly speaking, about 3900 m² of public green space will be built in this area and about 1.20 km of bicycle lanes will be built (**Figure 2**). According to the project presentation, the construction will start in the fall of 2023 and is scheduled to be completed in time for the 2026 Olympics.

According to ACI/Istat data [33], the road traffic accident and road traffic injuries in Milan is leading to a frightening situation (**Table 1**).

**Table 1.** Road accidents and road traffic injuries in Milan in the last 3 years

| Years | Traffic Accidents | Fatal road accidents | Deaths | Injuries |
|---|---|---|---|---|
| **2019** | **13,607** | **102** | **106** | **18,097** |
| **2020** | **8,043** | **69** | **74** | **10,207** |
| **2021** | **11,385** | **87** | **87** | **14,390** |

Source: www.aci.it (2019-2020-2021) [33]

**Figure 2**: Schematic diagram of the completed Loreto Open Community

Source: The municipality of Milan (2023, January 16) [32]

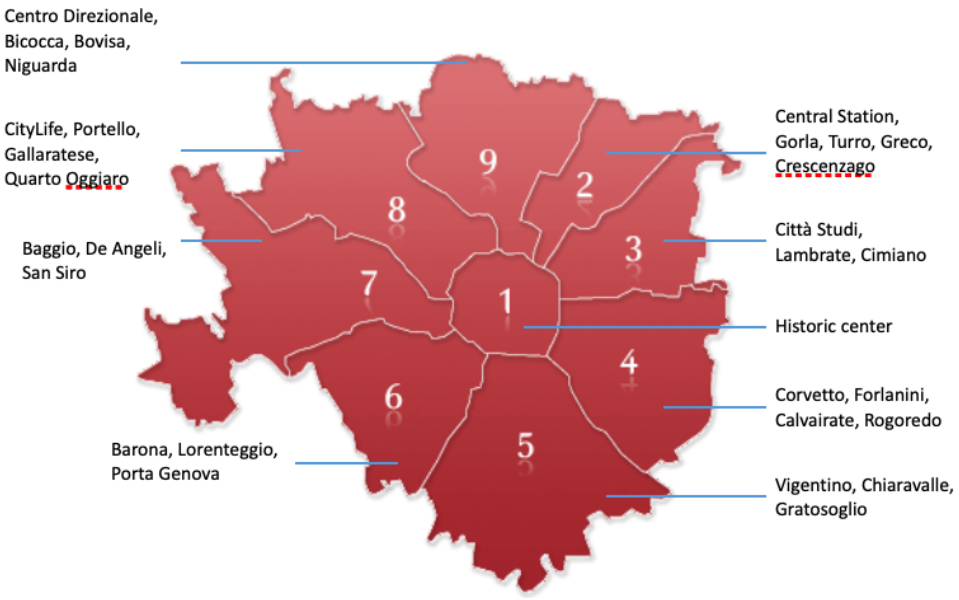


**Figure 3**: The nine municipalities of Milan

Source: Authors' elaboration

Source: Authors' elaboration based on Web.archive.org (2022)

Nowadays, Piazzale Loreto is proper a major traffic hub which crosses over municipalities 2 and 3 and Milan historic center (**Figure 3**). In Piazzale Loreto, traffic congestion is seriously elevated in comparison with other area as a result of the increased number of both residents (**Figure 4**) and various types of vehicles fighting for a road space share. Piazzale Loreto, is also as the intersection point of Via Padova, Viale Monza and Corso Buenos Aires. Only 3 km from the Duomo, it is one of the most accessible areas of the city, connected in less than 10 minutes by subway to the stations of Milano Centrale, the hub for high-speed trains, and Porta Garibaldi, access to the Porta Nuova district, as well as the university district of Città Studi. Piazzale Loreto is located in one of the densest and most active neighborhoods in Milan, with a strong commercial vocation and full of services. Especially, to see segment of a whole, one of the main traffic arteries connected to the square is the commercial avenue of Corso Buenos Aires which is one of the most famous and the longest shopping street in Milan with over 350 shops and outlets, reaching for about 4.5 km from the Duomo to the Piazzale Loreto [35]. However, the traffic situation of the area of Piazzale Loreto in Milan makes people worried. The casualty rate of traffic accidents in Piazzale Loreto remains high, causing great threats and damage to people's lives and property. The reality of Piazzale Loreto's road safety accident is grim in terms of painful facts. However, with the gradual imbalance between economic benefits and environmental benefits in this area, a growing demand for regeneration has been created. The high percentage of accidents and injuries have raised the issue of reducing speed in the urban environment and made Milan proclaim itself a '30 City', instituting the 30 km/h speed limit as of 1 January 2024 [36]. The establishment of 'City 30' in Milan represents an innovative and effective measure that combines integration between different transport modal compositions, compliance with climate commitments, improvement of liveability and significant traffic fluidification. But other measures to protect road users are also indispensable, such as good design of squares and road junctions, especially for the busiest ones, such as Piazzale Loreto.

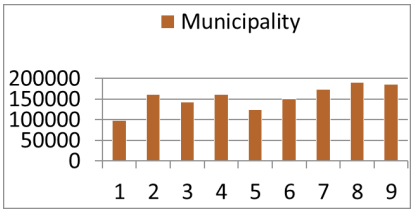


**Figure 4**: Resident population of nine municipalities of Milan as of December 31, 2021

Source: Authors' elaboration based on Comune.milano.it (2022) [34]

There is, in addition, one further point to make. The neighbourhood in which Piazza Loreto Nord is located is known for the wide diversity of multi-ethnic cultures among its inhabitants. One part of it has taken on a more middle-class connotation, Via Padova, stretching eastwards towards Casoretto, carries the image of a neighbourhood plagued by crime, poverty and insecurity. This stigma has become deeply rooted in its community, perhaps due to the lack of government intervention and the government's constant reminder of its negative results, often portrayed in the media. Via Padova and Viale Monza are often in the media headlines for events involving drugs, prostitution, gangs, fights, drunkenness and the like. Consequently, the presence of local police in the area is also common. However, some statistics have revealed that the area has a low incidence of threatening crimes that do not seriously and consistently threaten individual safety[37]. It is therefore evident that stigma is a prominent problem in this area. Nevertheless, the efforts of various organisations, groups and individuals have poured in over the years to change this perception and build a better neighbourhood for citizens [38].

Its complex composition of many different nationalities is due to the period of deindustrialisation of Milan, which led to the influx of many immigrants who took the place of the factory workers who once lived there. Although the presence of middle-class Milanese families has remained in the area. It has been observed that most immigrants fall into the category of young working-class men and families who came to Milan to find the environment more accessible and familiar to them [38]. Students were also included in the demographic mix due to the convenience of the neighbourhood in relation to universities and inexpensive rents. This is why several parties have called for an 'urban regeneration project' of an area traditionally represented through negative discourses[39] also to redefine its identity, to attract new initiatives and investments for the creation of new facilities and businesses, transforming the landmark neighbourhood of Piazza Loreto into a young and ‘hip' place [40].

The absence of a common identity can cause people to isolate themselves from others, instigating exclusion, and segregation. This can lead to rise in social tensions among neighbours, due to misunderstandings. Advocating social cohesion by providing as many opportunities for residents to gather is what many associations have done to manage the complex makeup of people in Loreto square. Put briefly, the principal problems, in the area of Loreto square, are:

• Deep-rooted Stigma: The media has played a crucial role in the ingrained stereotype of the streets of Via Padova and Viale Monza. The surrounding neighbourhood has been painted as a place associated with drugs, prostitution, and crime, leading people to see it for the worst; an unsafe, chaotic place to the extent of being “unliveable” [41].

• Lack of Common Identity: The absence of a common identity can cause people to isolate themselves from others, instigating exclusion, and segregation. This can lead to rise in social tensions among neighbours, due to misunderstandings. Advocating social cohesion by providing as many opportunities for residents to gather is what many associations have done to manage the complex makeup of people in the area.

• Lack of Public Space: There are few defined open public space for residents to utilize [42]. Apart from several small plazas and parks along the main axes, in the area lacks intermediate public spaces among its architecture. Without such areas available, the presence of the district’s high density could be apparent and uncomfortable. People would also not have a proper meeting place that could promote social cohesion among neighbours, especially in spaces that are well defined with suitable facilities that attract their target audience. These spaces provide opportunity for people to share a common ground and can potentially promote interconnectedness within the neighbourhood.

• Unmanaged Housing: Residing in less than acceptable living conditions is hazardous for inhabitant’s mental health. The residents would rather spend time outside, potentially causing disturbances at night. Apart from that, degrading facades and unmaintained buildings are a sign of disorder. Referencing the broken window theory, by social scientists James Wilson and George Kelling, it argues that a well-maintained environment is an indicator for the levels of social cohesion and control in the area[43]. The lack of order evident would tend to encourage criminal behaviour, reflecting the absence of care and concern for the environment.

In summary, the environmental and social problems of Milan Piazzale Loreto area are the epitome of

Milan's urban problems, and the renewal project of Milan Piazzale Loreto is the key to optimizing the area's environment and alleviating social problems. Arslan and other scholars [44] stated (2022) that "Low environmental quality affects economic growth and well-being" (p. 58746). On the face of it, it is an emergency need to improve the road traffic order in this area, but judging by essentials, the objective facts of frequent traffic accidents in recent years show that this region has reached a critical moment for a change in the strategic pattern. With the increasing awareness of climate concern and low-carbon Europe in urban planning, many large European cities have also integrated the concept of making cities more livable into urban regeneration projects. The inauguration of the LOC 2026 hub took place on January 17, 2023, which becomes the public space for listening and being an info-point on Loreto Open Community (hereinafter referred to as LOC) - the urban regeneration project of Piazzale Loreto (Comune.milano.it) [45]. This urban regeneration project will give a rebirth a symbolic place (**Figure 2**) for the city focused on a sustainable and integrated approach has brought the world's attention to Milan again, the most densely populated and most industrially developed region in Europe, which is widely considered one of the largest cities in the northwest of Italy.

Here, the SWOT analysis tool is used to roughly sort out the ideas in order to clearly understand the current situation and mainly possible risks of the project (**Table 2**).

**Table 2.** SWOT analysis - LOC project

| | | | |
|---|---|---|---|
| 1.Highly qualified design and coordination team;<br>2.Relatively adequate budget;<br>… | S | W | 1.Contingent risk of construction geographical conditions;<br>2.Contingent flaws of design for resolving traffic congestion;<br>3.Possible risk of capacity to raise funds;<br>4.Risk of tight schedule;<br>… |
| 1.Creation of a new landmark for urban regeneration by optimizing the space;<br>2.Building a harmoniously open green community;<br>3.Enhancing livability for residents; 4.Milan 2026 Olympic Games;<br>… | O | T | 1.Global inflation; Political instability;<br>2.Risk of credibility of contractor;<br>3.Risk ofSupply and quality of labors;<br>4.Risk of material prices and supplies;<br>5.Risk of material transportation and storage;<br>6.Risk of stability of social order in the area;<br>… |

Source: Authors' elaboration

The main internal advantages of Milan LOC project are its high-level design and coordination team and its relatively sufficient financial budget. At the same time, the threats faced by the project include, for example, possible risks due to the geographical conditions of project construction; eventual flaws in the design idea to solve traffic congestion in Piazzale Loreto area; eventual risks to the ability to raise funds to finish the project; eventual risks of tight project construction schedules. The opportunities for this project are clear. For example, this project will greatly optimize the space of Piazzale Loreto and create a new landmark for urban renewal. In addition, the LOC project is conducive to promoting the construction of a harmonious and open green community and improving the livability of the area. The completion of the LOC project will become another unique landmark of Milan and will help start the "frontline game" of the Milan 2026 Olympic Games. Finally, the LOC project also faces many threats. For example, the project was being promoted during a macro-environment characterized by global inflation and turbulent international political landscape. The risks such as contractor reputation, labor supply and quality, material price and supply, material transportation and storage cannot be underestimated. The project construction site is located in an area with extremely heavy traffic flow. Stable traffic and social order in this area will be an important prerequisite to ensure the smooth progress of the project and the on-time delivery of the project.

## 5. The case of Shanghai Wujiaochang

Shanghai is a famous city with a long history and a rich culture, which manifests great historical and architectural value especially in the aspect of urban spaces generation [46]. Wujiaochang is located in Jiangwan area which also has a long history over 1100 years history up to now [47][48]. The term of Wujiaochang

(known as the Five-Corner Square, shown in **Figure 5**) was coined as it is located at the intersection of five converged roads which are Handan Road, Siping Road, Huangxing Road, Xiangyin Road and Songhu Road, in Yangpu district - the northeast corner (**Figure 6**) of Shanghai [50][51].

**Figure 5.** Wujiaochang before the reconstruction in 1989
Source: M. thepaper.cn (2021) [49]

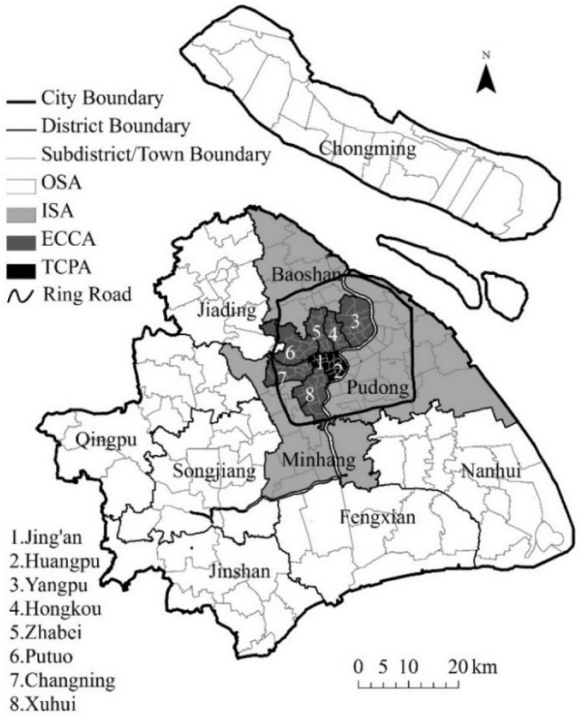


**Figure 6.** Administrative division of Shanghai.
Source: Reprinted from Wang, M., Liao, F. H., Lin, J., Huang, L., Gu, C., & Wei, Y. D. (2016) [52]. The making of a sustainable wireless city? Mapping public Wi-Fi access in Shanghai. Sustainability, 8(2), 111. ©2016 by the authors. Reprinted with permission of Creative Commons Attribution License.

Wujiaochang is very unique as it used to be the intersection point of the traffic artery in the earliest, largest and most comprehensive urban development master plan in the history of Shanghai - "The Greater Shanghai Plan" from 1927 to1937 [53]. The plan has had a significant and far-reaching impact on the urban structure and spatial layout of Yangpu District and even the entire urban area of Shanghai. Benefiting from the "Great Shanghai City Plan" from 1945 to 1949, the main roads in Wujiaochang area were built [54]. Gradually, the area formed a residential area, and businesses gradually developed. Subsequent phases of urban development outlines are the continuation and development of urban planning before the founding of the People's Republic of China, but the construction scale and goals are much larger, and the extensive urban planning is more detailed and systematic. In 1991, Wujiaochang was listed as one of the city's four urban sub-centers in the overall urban planning of Shanghai, and the urbanization process accelerated [55][56].

This area is a commercial hub and transportation hub in Yangpu District and has undergone significant transformation in recent years. However, the area presented some problems:

• Traffic congestion: Despite the government's efforts to improve public transportation, road widening projects, and pedestrian walkways, the area can still experience heavy traffic at peak times. This can lead to increased air pollution and reduced livability for residents and visitors.

• Affordability: The area has become a popular location for new commercial and residential developments, but this has led to an increase in property prices and rents. This can make it difficult for lower-income residents to afford to live in the area.

• Cultural preservation: Additionally, as the area has become more developed and prosperous, some of the older and more traditional aspects of the area's culture and heritage have been lost. This can lead to a sense of loss and disconnection among long-time residents and can impact the area's sense of community and identity.

To enhance the spatial land-use performance, on May 1, 2004, Wujiaochang roundabout square was put into use. The square integrates landscape, greening, leisure and transportation, and provides favorable conditions for the connection of commercial facilities around the Wujiaochang roundabout. It has become an important transportation hub in the northeast of the city center. It is a five-layer three-dimensional transportation network integrating elevated, ground, sunken square, tunnel and

rail transit (**Figure 7**).

**Figure 7.** Overhead view of Shanghai Wujiaochang square at night

Source: Chinesepictures.org (2016) [57]

Not surprisingly, the urban planning for the regeneration of the Wujiaochang area in Yangpu District of Shanghai, China has involved several key strategies to improve livability, sustainability, and economic growth in the area. Besides, the regeneration project of the Wujiaochang area in Yangpu District of Shanghai, China has brought several benefits to the local community and the city as a whole. Some of the key benefits include:

• Improved transportation: The construction of a new subway station and road widening projects have made it easier for people to get around, reducing congestion and travel times. In 2021, the number of road traffic accident deaths in Shanghai dropped by 29.8% compared with the average of the previous three years. Shanghai became the only city in China that did not have accidents that killed three or more people [58]. Increased economic activity: The development of new commercial and residential projects has brought increased economic activity to the area. This has created job opportunities and boosted the local economy.

• Enhanced livability: The regeneration project has created more public spaces and improved the quality of life in the area. The government has invested in the creation of pedestrian walkways and public spaces, making the area more pleasant and accessible for residents and visitors.

• Fostering innovation and entrepreneurship: The government has established innovation hubs and co-working spaces in the area, which have attracted entrepreneurs and start-ups to create a thriving innovation ecosystem.

• Preserving cultural heritage: The government has invested in the restoration of historic buildings and has promoted cultural events and festivals in the area.

Taken together, the regeneration project of the Wujiaochang area has brought significant benefits to the local community and the city as a whole. It has improved transportation, created jobs, enhanced livability, fostered innovation, and promoted cultural heritage. Wujiaochang's construction plays a pivotal role in the development planning of Shanghai. It becomes the best case of urban renewal for many reasons not limited to the above-mentioned, but in this analysis, they come down to three major ones for providing a reference for Milan LOC Porject:

1) Firstly, the case of Wujiaochang Sub-center adopts the design concept of solving traffic problems in layers[59]. The Wujiaochang roundabout interchange is divided into four floors. The first floor is the carriageway from Huangxing Road to Songhu Road that passes through the sunken square;the second floor is an oval sunken square; the third layer is the ground road in the way of round-the-island traffic; the fourth floor is the elevated road from Central Main Line Handan Road to Xiangyin Road, which passes above the sunken square. There is a pedestrian tunnel in the oval square of the Wujiaochang Roundabout Interchange. Pedestrians are brought into the sunken square from their respective road sections, instead of passing through the ground, so as to solve traffic congestion and the security problems caused by the mixed traffic of machines and non-motor vehicles[60]. According to the research [61], the specific design parameters are as follows: The roadway from Huangxing Road to Songhu Road in Wujiaochang Roundabout Interchange is two-way four-lane with a width of 21 meters; the oval sunken square is 4 meters deep and covers an area of more than 6,000 square meters. The long axis of the roundabout is 100 meters, the short axis is 20 meters, and the road around the island is a five-lane circle with an elevation of 4.10 meters and a total width of 20 meters. The ellipsoidal structure on the Shanghai Middle Ring Line is 106.8 meters long, 48.8 meters wide, and 15.8 meters high. The highest point of the arch beam in the middle is 10.4 meters away from the bridge deck; the viaduct is a two-way eight-lane bridge with a cross-sectional width of 30.5 meters. Put briefly, this concept of solving traffic

problems in layers adopts the separation of people and vehicles, different types of vehicles, different directions of vehicles, and different speeds of vehicles to effectively meet the travel needs of various groups of people from all angles, from Essentially solve the problem of traffic congestion.

2) Secondly, according to the research [59], the project adopts the method of expanding the protective shell around the island. The egg-shaped architecture is full of hatching concepts [61]. The main body of the building is a light steel structure, and the outer skin is made of glass and aluminum panels. The appearance is arranged in a modular array, and the top proportions are hollowed out in a gradual manner. The surface of some aluminum panels is sprayed with night-view metallic paint, which has great visual impact. The passing traffic is almost invisible above the Wujiaochang sunken square, which is completely integrated into the egg-shaped architecture landscape with varied lighting in the night. In addition to fully satisfying the technical safety requirements, the design has greatly improved the around landscape by highlighting one's own characteristics, which thereby has achieved double improvement of safety and landscape.

3) Thirdly, Wujiaochang case integrates landscape (central square, pool, lighting, water curtain and circular corridor, etc.), greening, leisure and transportation, which demonstrates the harmonious space environment between Human and Nature. It provides a place for association, entertainment, leisure and assembly for citizens in a fast-paced social life like Shanghai. It not only meets people's needs for the urban environment, but also stimulates the commercial value of the business circle. According to China Today, "statistics show that the Wujiaochang region, with an area of 7.6 square kilometers, is home to nearly 4,000 start-ups. In other words, there are 510.9 hi-tech companies per square kilometer there" [62]. The ultimate goal of the landscape area is to form a commercial value agglomeration area. With the development of the economy and the improvement of people's living standards, people have higher requirements for landscape display which should better reflect urban civilization, art and humanistic characteristics.

To sum up, there is no doubt that the renovation project of Shanghai Wujiaochang is the best exploration of urban renewal in Shanghai. Here, the model of SWOT scheme is used to represent the framework of Shanghai Wujiaochang project as follows shown in (**Table 3**).

**Table 3.** SWOT analysis - Wujiaochang project

| | | | |
|---|---|---|---|
| 1.Highly qualified design and coordination team;<br>2.Relatively adequate budget with stability of investment;<br>3.Successful layered design solved traffic congestion;<br>4.High contractor responsibility with quality and progress control management;<br>5.Hard working workers;<br>… | S | W | 1.Contingent risk of construction geographical conditions;<br>2.Risk of tight schedule;<br>… |
| 1.Political stability;<br>2.Creation of a new landmark for urban regeneration by enhancing the spatial land-use performance;<br>3.Building a harmonious community;<br>4.Building up an urban sub-center of Shanghai;<br>… | O | T | 1.Global financial crises;<br>2.Severe weather (long rainy season and extreme heat);<br>3.Risk of material prices and supplies;<br>4.Risk of material transportation and storage;<br>… |

Source: Authors' elaboration

The Shanghai Wujiaochang project has become an urban renewal best practice due to its many advantages. For example, this project not only has a high-quality design and coordination team, but also has an ample project budget. More importantly, it has received relatively stable investment support. The project's successful layered design concept significantly has addressed the area's previous severe traffic congestion issues. In addition, human factors such as the contractor's high sense of responsibility, quality and progress control management, and industrious workers greatly ensured the timely advancement of the project's construction. The project is located on a traffic artery and has withstood the multiple challenges of construction geography, geological conditions and tight construction schedules. This project was located in a macro environment of international and domestic political stability. In addition, this project has played a major role in improving the

spatial land use performance of the area, creating a new landmark for urban renewal in Shanghai, building a harmonious community in Wujiaochang and building a sub-center of Shanghai City. However, the project also faced many threats, including the global financial crisis, severe and extreme weather (especially Shanghai's long rainy season and scorching summer heat), material prices, supply, material transportation, storage and other threats.

## 6. Result and discussion

The project construction site in Piazzale Loreto will involve municipalities 2 and 3 as shown above. Specifically, this area covered by the project is the area most important and also critical. It represents typical Milan's problems surrounded by dense traffic and considerable smog. Besides, it is noteworthy that the Loreto new square will be full of culture, sociability, services and green spaces and will be focused on the benefits of all Milan citizens, Loreto Community and many other stakeholders, however, the existing traffic flow on the major roads which are currently connected to Piazzale Loreto will be just simply diverted around Piazzale Loreto rather than other effective way of directing the heavy traffic flow. Herein it is the huge challenge of course. Nonetheless, the Piazzale Loreto renewal project will aim to improve the current situation of traffic congestion in the important transportation hub in the northeast of Milan is committed to reducing the carbon emission pollution level of the area through the use of large amounts of vegetation. Its design features will play a vital role in attracting consumers and tourists, and will surely become another important landmark of Milan. In addition, it opens up public spaces for leisure and entertainment and cultural activities in the Loreto area. In short, this project will definitely promote further economic prosperity, cultural integration and sustainable low-carbon development of Milan and the Loreto area.

While the Wujiaochang project not only has offered good traffic functions, but also has built a beautiful landscape environment, and the sunken square has become the core of the island's commercial facilities. All in all, the Wujiaochang project embodies the concept of "people, environment, transportation, and development" intermingling.

Although the population of Wujiaochang area is relatively denser than that of Loreto area, and the traffic volume is larger than that of Milan, both projects represent typical cases of their respective urban renewal. Research results show that urban squares renewal has significant importance in developing the sustainable urban prosperity and low-carbon transformation (**Table 4**).

**Table 4.** Aspects of the two urban renewal cases

| Urban renewal cases | Aspects regarding sustainable urban prosperity | Aspects regarding low-carbon transformation |
|---|---|---|
| Piazzale Loreto | 1.Committed to improving traffic order in the Piazzale Loreto area<br>2.Committed to improving the functions of the square<br>3.The improvement of urban quality will be reflected in the renewal project of Piazzale Loreto, which will become one of the landmark buildings for the 2026 Olympic Games.<br>4.Committed to the promotion of urban landscape<br>5.Committed to improving social benefits and promoting economic prosperity | 1.Committed to improving green vegetation in the square and its surrounding areas<br>2.Committed to improving air quality in the square and surrounding areas<br>3.Committed to promoting the use of renewable energy |
| Wujiaochang | 1.Huge improvement in traffic order in Wujiaochang area<br>2.Great improvement of the function of the square<br>3.The improvement of urban quality also benefits from the establishment of Wujiaochang Urban Sub-center<br>4.rban landscape enhancement<br>5.Improvement of social benefits and promotion of economic prosperity | 1.A substantial increase in the amount of ecological greening in the square and its surrounding areas<br>2.Improvement of air quality in the square and surrounding areas<br>3.Use of renewable energy |
| Results | The great importance of urban squares renewal in promoting sustainable urban prosperity and low-carbon transformation | |

## 7. Conclusion

From the comparitive analysis of cases study of Milan Piazzale Loreto and Shanghai Wujiaochang, it can be seen that in the development process of urbanization

whether in Italy or in China, the central cities such as Milan and Shanghai have played a crucially significant role. It is worth noting that large-scale square renewal projects play a leading role in promoting sustainable urban prosperity and low-carbon transformation around the square and the city. Furthermore, the value of this article also lies in drawing more attention from the scientific community and policy makers to urban renewal projects in Milan, especially in an era of challenges posed by a Green EU and the Sustainable Development Goals. Undoubtedly, urban renewal has shifted from traditional methods to more practices that promote sustainable urban prosperity and low-carbon transformation and renewal.

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## Author's Contributions

All the Authors conceived and designed the analysis; collected the data; contributed data or analysis tools; performed the analysis; wrote the research article.

## Ethics Statement

Ethics requirement is not applicable.

## Availability of Supporting Data

Availability of supporting data is not applicable.

## Conflict of Interest

Conflict of interest is not applicable.

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