TeMA

Journal of
Land Use, Mobility and Environment

print ISSN 1970-9889 e-ISSN 1970-9870
FedOA press - University of Naples Federico II

DOAJ anvur Rivista scientifica di classe A - 08/F1 Scopus WEB OF SCIENCE

NEW CHALLENGES FOR XXI CENTURY CITIES

Global warming, ageing of population, reduction of energy consumption, immigration flows, optimization of land use, technological innovation

Vol.17 n.1
April 2024

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1 (2024)

Published by
Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"

TeMA is realized by CAB - Center for Libraries at “Federico II” University of Naples using Open Journal System

Editor-in-Chief: Rocco Papa
print ISSN 1970-9889 | online ISSN 1970-9870
Licence: Cancelleria del Tribunale di Napoli, n° 6 of 29/01/2008

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The cover image shows older people climbing Via Raffaele Morghen's stairs in Naples (Source: TeMA Journal Editorial Staff).

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TeMA
Journal of
Land Use, Mobility and Environment

TeMA 1 (2024) 71-87
print ISSN 1970-9889, e-ISSN 1970-9870
DOI: 10.6092/1970-9870/10414
Received 30th October 2023, Accepted 4th March 2024, Available online 30th April 2024

Sustainable development and proximity city: the environmental role of new public spaces

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Abstract
Biodiversity, urban regeneration and the climate crisis are inseparable issues and must be addressed simultaneously. The article addresses the potential synergy of the 15-minute city approach to the environmental role of new public spaces. There is a need for a multi-scalar and cross-sectoral approach to open space design that considers environmental resources and components as levers for urban regeneration and socio-economic development. Rethinking the city is part of rethinking the relationship between density, land consumption and sustainability, in which interventions transcend public-private space dichotomies through strategic spatial planning. Proximity can give shape, direction, and meaning to the development of settlement systems. Networks and relationships between spaces and land values must consider environmental dominants as part of spatial design. In this sense, new ecological public spaces can contribute to climate adaptation and increased urban well-being. The paper consists of two main sections: the first focuses on global challenges and the planning of resilient cities; the second deals with theoretical and application aspects of the concept of proximity about ecological transition (Portland and Barcelona).

Keywords
15-minute city, Ecological transition, Public space

How to cite item in APA format
Bocca, A. (2024). Sustainable development and proximity city: the environmental role of new public space. *TeMA - Journal of Land Use, Mobility and Environment, 17* (1), 71-87. http://dx.doi.org/10.6092/1970-9870/10414

1. Introduction

The 15-minute city is an integrative opportunity to reconfigure the city's open spaces. It is crucial to identify the design relationships that open spaces can establish with issues of adaptability and resilience. Although the city of proximity emphasises community priorities, it also highlights how public spaces are unable to respond to extreme phenomena. It is well known that town planning continues to operate in situations of uncertainty and the term emergency persists in planning. This consideration prompts a review of the approach of urban planning discipline to deal with the unexpected. It is a question of re-functionalising new public spaces not only from a social and economic point of view, but also of recreating a balance from an ecological and environmental point of view. Overall, new public spaces must be vital components of sustainable urban development, promoting environmental conservation, resilience, and community well-being in increasingly urbanised landscapes.

The dispersion of the urban fabric and the rapid expansion of urbanised areas, based on rigid zoning systems and road infrastructure, have incentivised monofunctionality and private car use, along with the loss of the urban effect and degrees of biodiversity. It is no coincidence that car-centric policies, while increasing the speed of travel, have also defined spatial configurations with problematic socio-economic and ecological inequalities (Meschik, 2012; Hickman & Banister, 2014; Eleutério et al., 2023). The concept of the neighbourhood city does not specifically delve into environmental protection issues, focusing mainly on the issues of essential services and mobility (Khavarian-Garmsir, Sharifi & Sadeghi, 2023). The city has an innate complexity in which urban subsystems continuously interact and influence each other[1]. The neighbourhood describes a multidimensional form of relationship between actors whose practices and backgrounds can provide further insights into transitions towards sustainability (Boschma, 2005). This study focuses on the ecological transition and the new environmental role of public space. The manuscript is also consistent with the implementation of the Green Deal at the local level, the challenges of ecological transition and the achievement of the 2030 Agenda goals. The objective of the research is a qualitative assessment of the principles of sustainability and climate change in relation to the city of proximity and the new environmental role of public space. The research used the qualitative review method to examine the literature and obtain extensive information on how the ecological transition is interpreted in the design of public spaces and regenerative processes in the built environment. The analysis focused on the principles of sustainability and climate change in relation to the city of proximity and the new environmental role of public spaces. On the one hand, it is proposed to highlight the priority role of public space in the sustainable development of the city, and on the other hand, the need to adopt a new approach in the design and regeneration of public space.

The article is structured as follows: Section 2 highlights the relationship between the ecological transition and the city of proximity. Section 3 analyses how the principle of interconnection between new public spaces and the flexibility of urban planning instruments and urban regeneration processes. Section 4 analyses the new environmental role of public space in driving urban well-being. Section 5 analyses the case of Portland and Barcelona as an application of the principle of proximity and climate change mitigation, highlighting the strengths and weaknesses of the case studies. Section 6 critically discusses the results obtained.

2. 15-minute city: proximity and environment

The city stands at the intersection of a multitude of social needs and functions. The challenge of innovation fuels thinking about ecosystem issues, mobility, education, employment, and care. These concepts underlie the 15-Minute Approach to the City. The theory, the result of C. Moreno's studies, is applied in experimental

[1] The concept of 'environmental awareness' evaluates how human activities and cities can have a significant impact on the natural environment and the surrounding ecosystem (UN, Department of Economic and Social Affairs, 2017).

form in Paris and the subject of attention in other cities around the world (including: Ottawa, Melbourne, Portland, Nantes, Milan). It is based on rethinking the functioning of the city from a new hierarchy of organizing principles of social life guided by the efficient use of time. The 15-minute city concept aims to create self-sufficient neighbourhoods with the essential functions of living, working, commerce and education by decentralizing urban functions and services.

However, it is necessary to remember that 15-minute city is not new in the urban planning. This approach has its roots in proposals developed during and after the Industrial Revolution. These include E. Howard's Garden City (1965) and C. Perry's Neighbourhood Unity (1923), which focused on planning for human-scale environments. The centrality of the neighbourhood and its mixed nature are also central to the studies of J. Jacobs (1969) and the urban theories of the postmodern approach (Bruno et al., 2023). The concept of the neighbourhood is a simple one that resonates with many current issues, but today it is rather a matter of reinventing it in light of the ecological and environmental transition.

The 15-minute city concept integrates different dimensions to generate a multi-centred settlement structure. By recomposing and reducing spatial metrics, it shapes the city with new principles of regulation of both time and use. This requires a renewal of existing infrastructures on which to graft services and new public spaces for social and cultural activities. In this vision, both the concepts of chronotopia and topophilia are overcome in favour of a multi-centred settlement structure in which public spaces play a priority environmental role. Ecological and environmental transitions have multi-scalar relationships that are determined with respect to issues of proximity, public space, urban structure and time (Lopito et al., 2022).

The objective is to create a spatial network in which the project coincides with the territory in order to recognise its future effects and impacts. It is no coincidence that open spaces are intended as collective places in which to recognise both the public dimension and the instance for experimentation with new spatial approaches of human-nature hybridisation. The concepts of healthy streets, liveable neighbourhoods are not simply revisited, but are an invitation to reflect on urban modes and habits, going beyond the simple concept of the permeable city of 15 minutes (White, 2023; Abdelfattah et al., 2021). Living neighbourhoods means sharing an urban space, resources of a liveliness that is expressed in a thousand forms: streets, parks, cultural spaces, etc. It is necessary to transform the urban space that is still strongly monofunctional, with a centre and several specialised areas, into a polycentric city supported by the principles: proximity, diversity, density, ubiquity (Moreno, 2023) (Fig.1).

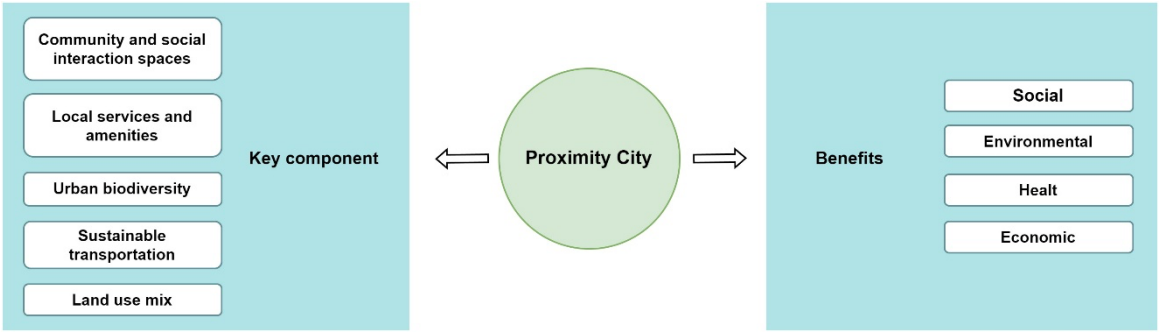

Fig.1 Key component and benefits of proximity city. Source: Author's elaboration

Urban planning is traditionally aimed at achieving spatial development goals and promoting a sustainable urban future, but it has not always had an adequate place in the planning process (Naess, 2001). The application of the 15-minute city to the fractal nature of most settlement systems is what can give shape, direction and meaning to settlement development. Simultaneously, the network structure between spaces and spatial values must necessarily consider environmental dominants as part of spatial design. However, climate effects testify to the degradation of 20th century urban palimpsests, as well as highlighting the need for new spatial meanings. Urban awareness is strategic in a period of transition and change, in which the city is called

upon to modify itself and implement conformity between its different layers (Bocca, 2021). This reinforces the idea that proximity should be one of the criteria for designing the new environmental role of public spaces, in addition to the creation of a functional mix.

The idea of abandoning the definition of open space as a process leads to the definition of a design strategy that defines both ecological characteristics in the sustainable design process and a level of indeterminacy. This logic suggests that the dissolution of cities can be overcome by entrusting new public spaces with the environmental role of variable-geometry hinge and environmental relationship with the territory. The challenge of urban regeneration is surely the ambition of cities to develop a network of interconnected ecological spaces and corridors in which urban environments can recognise human-nature coexistence.

3. The planning frameworks ecological transition

Cities are complex systems and today's challenges require systemic and holistic approaches that consider many distinct factors and feedback loops and simultaneously address sustainability, urbanity, health, and well-being (Nieuwenhuijsen, 2021). Urban regeneration, emptied of the uncertainty of bureaucratic timescales, requires integrated interventions that form the framework on which to set the ecological transition. The contemporary city is oriented towards a design innovation that requires flexible systems compared to those designed for the modern city (Valentino & Lutzoni, 2020; Secchi, 2010). Furthermore, cities are called upon to play a role both as actors in the development of socio-technological systems and as facilitators of places for sustainable innovations (Geels et al., 2011). Planning processes must be qualified as territorial-structures in which environmental dominants are identified as generators of a different order of settlement space and a project is realised around them (Maciocco et al., 2011).

There are numerous policies, programmes, and initiatives aimed at the environmental regeneration of public spaces. Among the most recent initiatives are the EU's Next Generation programme, together with: (i) Green Deal; (ii) Urban Agenda 2030; (iii) European Biodiversity Strategy 2030; (iv) Cohesion Policies; (v) LIFE Programme; (vi) European Structural and Investment Funds (EIS funds). However, urban policies face extreme difficulties in implementing adaptive and transformative sustainability strategies due to old legislation that imposes operational limitations (Gaglione, 2022; Nieuwenhuijsen, 2018).

Some planning practices, even before the pandemic, articulated the hypothesis of building comprehensive visions in which neighbourhoods are the main components of the design of decentralised, yet interconnected urban structures. Furthermore, decentralising urban services to reduce unnecessary travel, expanding cycling and walking routes, redesigning public spaces and developing Greenway, in line with the urban models of Green City, Slow Movement, Walkable City. In this sense, the neighbourhood city can implement an integrated regeneration project if both transformations and spatio-temporal and sequential location are addressed (Marchigiani & Bonfantini, 2022). These approaches appear in line with the main strategic and financial axes represented by the Recovery Found Next Generation and the Green Deal, with the aim of qualifying open spaces as relevant physical elements for sustainable spatial planning (Scheiber & Zucaro, 2023). Although the path set by European directives is to make cities greener, the problem of the impact of green infrastructure and gentrification remains an unresolved issue.

However, urban planning tools are numerous and each of them addresses the main issues differently: while Italian cities can rely on institutional planning and programming tools anchored in the historical tradition (General Regulatory Plan) and others recent (Climate Adaptation Plan, Sustainable Urban Mobility Plan, etc.), cities such as Paris operate in both strategic and operational terms. However, coordination is still lacking and cities explore different strategies, solutions and technologies, depending on the potential of local contexts. Faced with this scenario, the need to accelerate the sustainable urban transition emerges (Gaglione, 2022; Fratini, 2023).

This research shows how the 15-minute concept has encouraged physical determinism, where urban form is improved and social and economic issues cannot be addressed by physical values alone (Khavarian-Garmsir, Sharifi & Sadeghi, 2023). The need to rethink open spaces through the layering of functions and uses collaborates in the creation of a project between the 'extraordinary' events of climate change and the 'ordinary' events of everyday life in the city (Crupi, 2015). It emerges that the 15-minute city has a potential contribution to sustainability, but is not without obstacles to implementation. This underlines how planners need a form of sustainability assessment and measurement integrated into the planning process (Yigitcanlar & Teriman, 2014). Against this backdrop, the issue of climate finance is central to urban regeneration narratives. It is crucial to ensure that urban models can not only meet community needs, but also ensure economic equity for the benefit of local governments (SDG 11) (Allam et al., 2022). This principle bases its effectiveness on a careful review of the effects, positive or negative, that any new project may produce in a given area in relation to planning instruments (Talia, 2022).

Various urban policies can qualify the 15-minute city as a solution to rebalance urban opportunities, counteracting de-densification, urban sprawl and consumption of environmental resources. These visions focus on the negative aspects of urbanisation and the benefits of urban living (Caragliu, 2022). It is clear that the 15-minute city should not be the only attempt to create 'minimal ecological units' (Manzini, 2021), 'minimal resilience units' (Pede et al., 2023), 'minimal layouts' (Crupi, 2015), 'summation of villages' (Shearmur, 2021), but should pursue the promotion of a unified vision of the city. Therefore, holistic and strategic urban planning, mobility and infrastructure development and climate adaptation play a decisive role (Pope et al., 2015). Urban challenges should not be solved through partial or local solutions, but rather should be challenging solutions educated by contemporary issues.

4. Public space and new sustainable perspectives

In the era of ecological transition, reflection on the new role of sustainable public space requires a careful consideration of the socio-spatial and sociotechnical impacts of urban regeneration and redevelopment projects in environmental renaturation and mitigation strategies (Errante, 2023). New public spaces can play a crucial role in sustainability and environmental management according to the themes:

- Green infrastructure to help mitigate the effects of urban heat islands, reduce stormwater run-off and provide habitat for wildlife;
- Carbon sequestration is aimed at offsetting carbon emissions and combating climate change;
- Preservation of biodiversity to promote human-environment interaction and reduce land consumption;
- Promotion of sustainable transport aimed at realising the city of proximity and promoting the use of bicycles;
- Community involvement and awareness-raising to promote environmental awareness;
- Urban resilience and adaptation to improve the ability of urban areas to absorb and manage water, in particular by reducing the risk of infrastructure damage;
- Environmental well-being and connection with nature to improve the perception of public space.

Today, many urban practices of adaptation to climate change find application in urban centralities, where new spatial configurations can be defined in relation to the ecological transition, as well as giving new meaning to public space. Now we talk about squares, boulevards, urban parks, but each of them must also find design solutions to live them as an emergency solution. However, these are not the only spaces on which to experiment with adaptive solutions. Dense spatial figures such as axes, rings, boulevards, even green corridors with a performance function can be found in the literature. Such actions not only innervate the territory with a complex patchwork of ecosystems, but also highlight the fragility of certain natural ecosystems (uncultivated

areas, brownfields, abandoned soils). This leads to the recognition of 'fertile design spaces' on which to set urban and territorial regeneration processes (Pisapia, 2021).
The environment must be read as a lever to establish unprecedented relationships in the urban centrality and establish spatial structures and concepts dense with nature and history (Maciocco & Tagliagambe, 2009). The objective is not only to reverse the process that sees the city driven by consumerist productive approaches, but to build settlement systems capable of developing together with nature, acquiring its prerogatives and capacities (Acierno, 2021) (Fig.2).

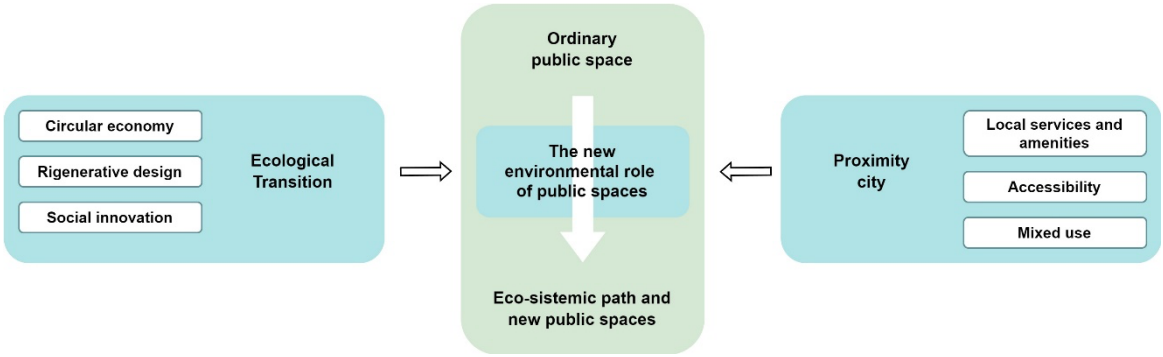

Fig.2 Ecological transition and proximity city: the role of new public spaces. Source: Author's elaboration

These problems are often addressed in their respective fields and therefore bringing together green infrastructure solutions from an urban perspective offers an opportunity to promote a more holistic approach (Pultrone, 2024). This induces a wide range of policies aimed at avoiding gentrification processes, in which the city is an urban ecosystem composed of multiple neighbourhood units that are connected and influence each other (Manzini, 2021). The relationship between dimensions and contexts emerges strongly, both in terms of place characteristics and design choices. In these interventions, the spatial dimension evolves with respect to the past, both in its settlement configurations that identify new empty spaces, and in the presence of contexts differentiated by use (Cialdea & Badami, 2017).
However, it is precisely in empty spaces that experiences can be realised to improve the possible relationships between environmental and human habitats, forms of urbanity and spatial configurations. The aim is to identify a multi-scalar and cross-sectoral approach to the topic of open space design, in order to take environmental resources and components as levers for urban regeneration and socio-economic development. In this sense, traditional solutions and techniques are unable to achieve the new levels of performance required by the current green transition. Therefore, quantifying the input-output ratio of urban functioning can contribute to the development of alternative urban layouts based on the environmental role of public spaces[2].
According to this reading, the new network of public spaces with an environmental role activates: (i) the recognition and protection of eco-system services in the urban environment; (ii) the creation of green infrastructure; (iii) the adoption of nature-based solutions. However, the discourse on sustainable public space does not end with the environmental component alone. The future challenge will be to link the ecological transition with the energy transition in the possibility of spatialising solutions that are mutually consistent and respectful of the spatial context. Only through a holistic approach is it possible to implement the three dimensions (economic, social, environmental) of sustainable development.
The implementation of such a vision makes it possible to understand public space as a resource in the event of emergencies (environmental, climatic and health), as well as allowing flexibility of functions (Carra et al., 2022). Urban green spaces must be studied as a network so that the performance of the system as a whole

[2] The combination of physical transformations and weather conditions can define new spatial configurations. During extraordinary weather events, if public space continues to function, not only does it increase the physical resilience of the place, but also the social resilience of the community.

can be measured and according to a multidisciplinary reading (Tulisi, 2017). However, addressing environmental and biodiversity issues offers a transcale approach in which different scalar and/or complementary levels can be identified. This offers the opportunity to investigate the new environmental role of public spaces in relation to the strategic planning of large areas.

5. Example of multi-scalar urban regeneration

5.1 Portland

The interest in the concept of proximity, although it exploded with Carlos Moreno, can be identified as early as the Portland Plan of 2012. Proximity structures urban planning thinking in the search for models of spatial, social and economic balance (Vitullo, 2022; Giaimo, 2023). The use of comprehensive neighbourhoods in Portland is elaborated on three principles: education; healthy, connected neighbourhoods; and economic prosperity and accessibility. The plan includes 25-year goals and 5-year action plans. Goals are set for the entire city and for specific geographic areas (City of Portland, 2014; 2023).

In particular, the 'healthy and connected neighbourhoods' pillar is based on an urban structure that provides accessibility to services within a 20-minute radius[3]. On a larger scale, however, it connects different habitats through natural areas, greenways and civic corridors[4]. Since the Buildable Lands Inventory Report (2012), the City of Portland has highlighted inadequate infrastructure services and susceptibility to environmental hazards. Building on these considerations, the Comprehensive Plan 2035 presents integrative policies to improve Portland's resilience (e.g. growth in compact centres and corridors, provision of City Greenways and Urban Habitat, employment opportunities, etc.), and the city's urban development plan.

The idea is to create neighbourhoods where people have access to essential services, including grocery stores and other commercial services, public schools, and parks (City of Portland, 2014). The plan is developed as a network of nodes, connected by green paths that allow nature to penetrate the city. This goal is in line with achieving social equity and creating urban forests to increase biodiversity. Neighbourhood centres can induce changes in housing policies through improved bicycle and walking infrastructure and travel. Each center should have a diversity of people and uses to support both environmental sustainability and the 15-minute city (Steuteville, 2023).

Similarly, the goal of the plan was also to intertwine the urban fabric with the city, respecting the Willamette River that divides the city from east to west. Therefore, Portland uses green streets, eco-ways, trees and other green infrastructure to manage stormwater, protect water quality and improve watershed health. Urban waterways, forests, and wetlands manage stormwater naturally and are part of Portland's green infrastructure.

In addition, Portland was among the first cities in the United States to adopt a climate action plan in line with the Paris Agreements. In 2020, by adopting a climate emergency declaration, it reinforced its emissions reduction goal to achieve zero-emissions before 2050[5]. If the Climate action plan (2015) is tasked with getting 80% of the population to live in complete neighbourhoods; the 2035 comprehensive plan acts as a link between local level policies with regional and state agencies. In addition, the Portland Comprehensive Plan is in line

[3] Some structuring elements of the Portland Plan is also found in Melbourne's recent strategy, both in terms of walking distance (20 minutes) and the promotion of interconnected neighbourhood centres.

[4] Civic corridors are defined as roads and public transportation that connect neighbourhoods to each other and to the city centre and provide space for stormwater and other nature-based solutions.

[5] The main goals for 2030 are divided into 9 main pillars: (i) Buildings and energy; (ii) Urban form and transportation; (iii) Consumption and solid waste; (iv) Food and agriculture; (v) Urban forest, natural systems and carbon sequestration; (vi) Climate change preparation; (vii) Community engagement, outreach and education; (viii) Local government operations; (ix) Implementation.

with the Transportation System Plan[6], in which each road is a combination of the transportation function and the surrounding context.

Since individual sites and projects in limited urban environments may vary in terms of challenges and opportunities, the framework also identifies diversion processes that provide flexibility when it is not possible to meet all applicable standards (StreetPDX). This approach involves the mixed use of streets, dividing them into pedestrian zones, pavement/flexible zones, and thoroughfares. This supports the Portland administration's desire to extend the use of roads beyond their transport function, consistent with the role of environmental services. It is therefore not just a matter of identifying places of success, but of bringing out areas where action can be taken to make them more attractive, walkable and ecologically contextual (Tab.1).

Goals	**Spatial planning and urban regeneration** **Column 3**
Economic Prosperity	Physical Planning and spatial reconfigurations - Increase proximity to services and accessibility - Re-invest in Brownfields - Promote land use mix, especially in existing industrial sites
	Community involvement and urban development - Increase sites for businesses and employment opportunities - Promote the Co-design process - Promote employment growth at colleges and hospitals
Human Health	Physical Planning and spatial reconfigurations - Increasing access to complete neighbourhoods - Implementation of city greenways
	Community involvement and urban development - Strengthen consideration of environmental justice - Promoting physical activity in public space
Environmental Health	Physical Planning and spatial reconfigurations - Increase connectivity and multifunctionality of green space through greenway corridors - Preserve and enhance Urban Habitat Corridors - Implement neighbourhood greenways
	Community involvement and urban development - Support nature-friendly infrastructure
Equity	Physical Planning and spatial reconfigurations - Encourage affordable prices in neighbourhoods - Create regulations that acknowledge that one size does not fit all
	Community involvement and urban development - Co-design processes for the production of public space - Provide for on-going affordability - Include under-served and under-represented populations in decisions that affect them - Bottom-up initiatives for the improvement of quality of life
Resilience	Physical Planning and spatial reconfigurations - Promote the development of new housing units in targeted geographic areas so that services and public spaces are within walking distance of residents and reduces carbon emissions - Concentrate growth in centres and corridors to minimise carbon emissions. - Increasing biodiversity through green and blue infrastructure
	Community involvement and urban development - Addressing gentrification through to preserve affordable housing and local businesses.

Tab.1 Evaluation of Portland 2035 Comprehensive Plan

[6] Reference is made to Bicycle Plan 2030, Pedestrian Master Plan, Freight Transportation Master Plan, Neighbourhood Area Plans, etc.

Overall, the plan promotes the self-sufficiency of neighbourhoods by localising basic urban functions, including healthcare, education, childcare, retail, recreation, and fresh food production.
Applying the Portland model implies a rather high degree of localisation of activities that does not currently exist (Pozoukidou & Chatziyiannaki, 2021). While encouraging changes in parking policies and infrastructure improvements, the functional mix to support the 15-minute city is not yet fully identifiable (Fig.3).

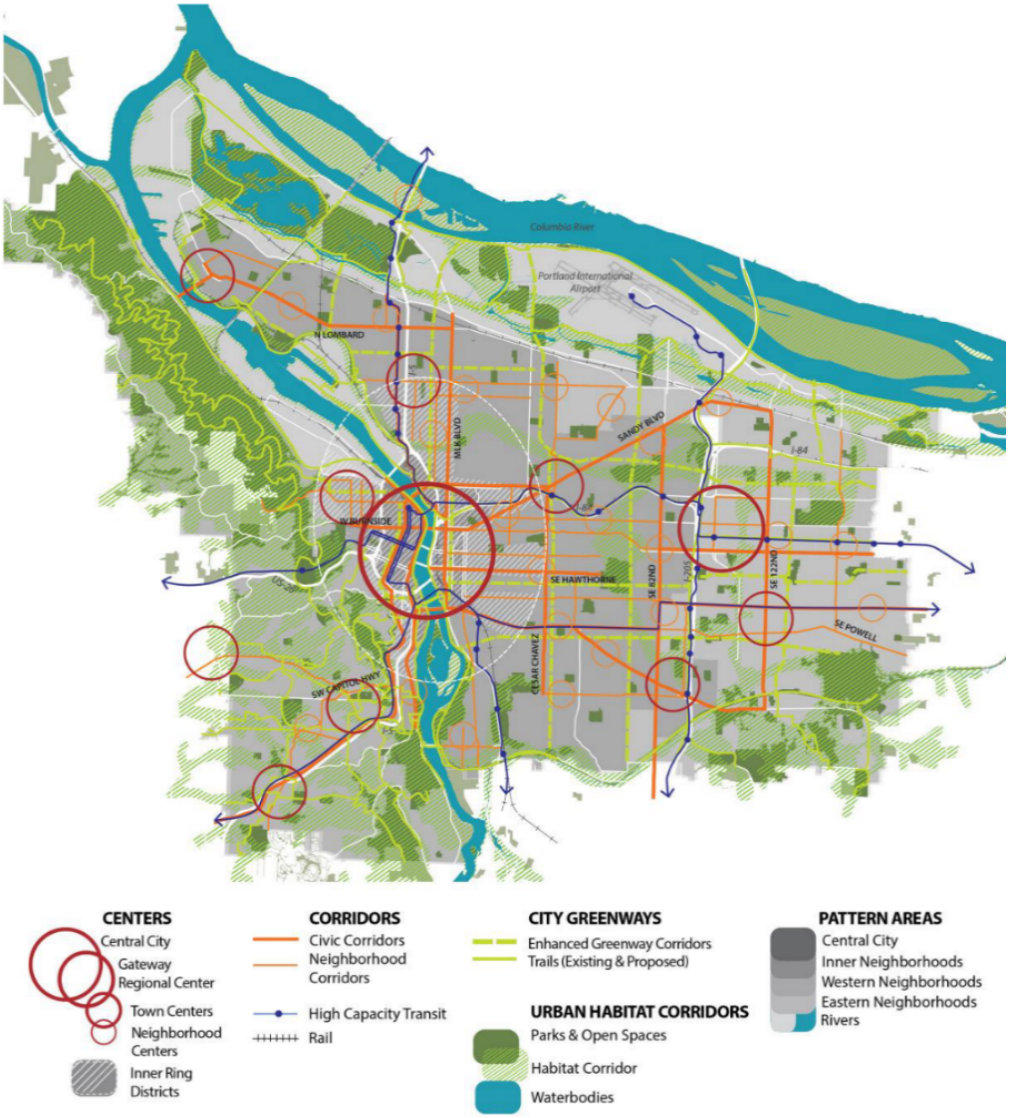

Fig.3 Urban design framework. 2035 Comprehensive plan. Source: City of Portland (May 2023)

5.2 Barcelona

Barcelona's contribution to the 15-minute city concept, in the context of the Super Illes, is organizing by a strong sustainable footprint and integration with the chessboard (eixample) layout (Alberti & Radicchi, 2022). Recent analyses suggest that the city of Barcelona already presents some conditions of a city of proximity, democratic modes of transport (Ortiz et al., 2022), contributing to increasing homogeneous accessibility to essential services. The interest in Barcelona's urban transformation lies in its ability to simultaneously address social, economic, environmental and climate change mitigation issues. In addition to increasing urban proximity, urban transformation aims to improve the quality of public space. In this vision, neighbourhoods are understood as minimal socio-ecological units surrounded by green axes and slow mobility networks for the use of public space.

In Barcelona, while organizing the importance of user-centred mobility, we go beyond the 15-minute city in an attempt to overcome functional zoning through the development of mixed neighbourhoods.
This is achieved by organizing urban spaces in such a way as to reduce distances and increase the walkability of public spaces.
It is evident how urban planning integrates with public mobility planning and acts at different plan levels. Barcelona, in order to strengthen and expand the range of socio-environmental services provided by green infrastructure, has consistently worked in synergy between different urban strategies and planning levels (Ecology, Urbanism, and Mobility Area of the Barcelona City Council, 2020; 2023).
The combination of different urban strategies creates the planning conditions for the Implementation of green infrastructure and healthy arteries on which public relation spaces are built. Ultimately, Barcelon"s strategy can be omphasizesd as (Mecca, 2023):

- Urban planning with the use of transport and active mobility in the centre and a balanced distribution of services;
- Super-urbanisation with the creation of pedestrian zones, cycle paths and an increase in high vegetation;
- Public transport networks to serve a large catchment area through the implementation of a tariff integration system between different means of public transport, the construction of new metros and the expansion of trams and buses;
- Bike sharing for residents and visitors;
- Parks and green areas for recreation and nature for citizens.

Goals	**Spatial planning and urban regeneration**
Economic Prosperity	Physical Planning and spatial reconfigurations - Redeveloping the historic centre - Connecting the historic city with contemporary expansion - Decentralise public services - Promoting the mix of land uses
	Community involvement and urban development - Increase business sites and job opportunities - Promoting the co-design process
Human Health	Physical Planning and spatial reconfigurations - Designing public spaces with a high tree cover index - Designing safe spaces through spatial and lighting relationships - Reconfiguring public spaces in relation to the use of greenery
	Community involvement and urban development - Communicating the value of urban nature to inhabitants of cities.
Environmental Health	Physical Planning and spatial reconfigurations - Implement green and public spaces to increase and connect urban green infrastructure. - Integrate green infrastructure with structural elements at the metropolitan level.
	Community involvement and urban development - Activating citizen involvement in the conservation, protection and improvement of greenery and biodiversity in private areas.
Equity	Physical Planning and spatial reconfigurations - Making green and open spaces and public services accessible - Making housing prices affordable - Facilitating the use of public transport by reorganising the public transport service.
	Community involvement and urban development - To spread knowledge of urban nature and the value of its preservation.
Resilience	Physical Planning and spatial reconfigurations - Preserve and improve greenery and biodiversity in heritage green spaces. - Designing public spaces to counter heat islands.

Community involvement and urban development - Establish synergies with research centers to strengthen knowledge transfer. - Promote an active role of citizens in promoting and preserving urban nature in public areas.

Tab.2 Evaluation of Barcelona

Barcelon's strategy is to bet on the transcalar role of public space to innovate and omphasizee the potential of an established city model. The proposal of green axes, in addition to mitigating the effects of climate change and increasing connectivity, omphasizess the function of transit and leisure corridors for the community. This approach makes it possible to review the principles of green infrastructure planning for a dense fabric, as in the case of Barcelona.

The proposed green axes, with their increased connectivity, not only allow the migration of certain species and the repopulation of certain areas in heterogeneous landscapes, but also act as transit and recreation corridors for human beings. This creates a network of green spaces that serve the community and biodiversity (Magrinyà et al., 2023).

The Barcelona administration has drafted the Green-Hub Model document. This document describes how the street of the 21st century should be, moving away from the vision that sees it only as a territory for cars. The realisation of these cornerstones translates into a series of fundamental aspects related to uses, mobility, greenery, furniture, and lighting. These principles create a green pole that will encourage people to re-appropriate the streets, with more family life and local commerce and less pollution and noise.

The characteristics of the new street model will be determined by the idea of comfort in relation to the possibility of exploiting established urban networks to recover and generate new places in relation to community needs. This approach can be defined as urban acupuncture and urban naturalisation, combined with the idea of the city of proximity. It involves diversified public space projects in which public facilities and services can be inserted to generate urban centralities. This approach breaks with the idea of urban regeneration in the classical sense to consider it multi-scalar and interdisciplinary.

Fig.3 Green hubs planned for the Barcelona Superblock programme. Source: Gerència d'Àrea d'Ecologia Urbana, Consell Municipal de Barcelona

The case of Barcelona shows the evolution of the urban model towards environmentally networked blocks that not only connect green areas, but also create neighbourhood gardens (particularly in densely populated central areas) and increase the multifunctionality of green infrastructure and active mobility. The interventions implemented and planned in Barcelona are an attempt to combine social and economic functions with the new environmental role of streets and public spaces (e.g. urban drainage, storm water disposal, heat island elimination). In fact, Barcelona takes on the 15-minute city model through the systemic and fractal construction of the city (Mecca, 2023). The idea of the Supermanzana represents the 'transition-revolution' from the current city model to a post-pandemic and de-carbonised one, in which it is evident how the joint intentions of the Administration and the Agència d'Ecologia Urbana attempt to respond effectively to the plurality and diversity of urban demand (Tab.2; Fig.4).

6. Conclusion

6.1 Discussion

The topics of debate are climate change, proximity, accessibility, but undoubtedly the main theme is urban regeneration. Urban planners have always pursued design success through urban regeneration processes. If until the 1990s urban planning practice had dangerously drifted away from the theme of modelling space (Mascarucci, 1998), today the centrality of the design of urban space at different scales qualifies as a device in which to recognise and bring into coherence the different expectations, the differentiated outcomes of policies, and the operational connection between the different levels of government of the territory. Moreover, diffuse and dispersed urbanisation has led to the loss of landscapes and soils, as well as their related eco-system services. This has increased both consumption and exposure to multiple risks (environmental, social, climatic, etc.).

The sustainable development planning process must think about the needs and opportunities of territories. A dynamic vision should implement multi-level governance based on vertical alignment (international, national, regional and local) and horizontal involvement (public, private and social) towards a collective vision (Battisti, 2023). It is necessary for urbanism to change its perspective to recognise a new disciplinary status in which the civil economy develops with the ecological economy. In this sense, green infrastructure and nature-based solutions are key resources to guide urban transformations towards the ecological transition. Urban green spaces serve as a comprehensive tool for environmental sustainability, regulating urban ecosystem services and microclimatic conditions, protecting biodiversity and providing various socio-ecological benefits to city dwellers (Kumar et al., 2023).

In this sense, the green city sees urban centres as protagonists of change to achieve climate neutrality. The good practices examined show how the concept of sustainable mobility can be the basis for reversing the perspective of the classical city vision. However, in both cases, the main shortcoming concerns equity and the emergence of gentrification effects, in some cases already observed during the experiments and pilot projects. At the same time, what is interesting is the ability to combine strategic thinking and operational results through the definition of guidelines and the initiation of co-creation programmes with the community. The cases of Barcelona and Portland, high and low density respectively, address the issue of ecological transition through the reconstruction of environmental spatial continuity. The two cities examined, although in different contexts, recognise the environmental issue as a priority and become aware of it through the combination of strategic planning and operational actions, as well as the flexibility of urban planning instruments. However, in all likelihood, the actions taken by Barcelona sanction a new modus operandi in the treatment of urban nodes previously dedicated solely to automobile transit. Ultimately, in the absence of precise priorities and a spatialised vision of the urban context as a whole, a city perspective cannot be shaped simply by the paratactic

application of a model designed at the scale of neighbourhoods, however locally harmonious it may be (Marchigiani & Bonfantini, 2022).

The desire for urban renaissance must invest urban nodes of autonomous value, on which a search for socio-ecological efficiency of the territory can be set. The unresolved, or partially resolved, problem concerns the interrelationships of the urban dilemma between common goals, strategies, and interests to define urban transformation interventions to activate circular economies and increase the quality of life. Given the interconnected nature of climate change and biodiversity loss, the overall vision of the city cannot disregard the conditions essential to ensure the flow of ecosystem services. This requires going beyond immediate responses to multiple crises and implementing a holistic social-ecological systems approach to urban planning and design based on transdisciplinary integration.

The idea is not only to create different models of urban and territorial functioning, but also to create hybrid places to strengthen the resilience, cohesion and mixing of settlement systems. Public space is not just the extension of a street, but is what allows public, environmental, socio-cultural and economic needs to coexist. The quality of public spaces, the forms, specialisation and functioning of equipment and economic devices, the atmospheres, and the ways in which they are integrated into the system of urban centralities are at the core of the reflection on the future of the contemporary city (Alonso, 2013). However, quantity and access to green spaces are not enough; it is useful to recognise the quality of green spaces in fostering healthy lifestyles (Koohsari et al., 2023).

Moreover, the fragmentation of planning lines of action of some necessary policies demonstrates a complex and difficult synthesis at the local level to orient not only funding, but also converging objectives towards the right ecological transition. To this end, any urban strategy and policy must promote diversified settlement opportunities, respecting the conditions of environmental compatibility and possible new environmental and climate threats. This underpins spatial and functional flexibility in relation to the permeability of spaces and activities (Baratta, 2022). Therefore, urban centralities, places of living and natural environments identify networked urban spaces that cooperate with each other for a multi-scalar spatial project of sustainability on which the achievement of incremental goals hinge. It is a matter of intersecting ideas, evaluations and lines of work through which to consolidate the statute of the urban project aware of change and barycentric with respect to society's current development trajectories (Russo & Montedoro, 2022).

6.2 Research perspectives

Urban planning must start from new conditions and new visions educated by an awareness of urban complexity. In recent years, planning has been conditioned by a primarily large-scale approach, but urban quality cannot be entrusted exclusively to this level of planning. If we consider the quality of living and environmental issues as a synthesis between personal satisfaction and social justification, between creative processes and spatial performance, urban design can approach a new holistic and comprehensive approach. In this logic, it is possible to operate in the 'taxonomy of sustainable finance' by promoting investments for sustainable projects consistent with the objectives of the Green Deal and the Next Generation EU. This expresses an approach that intervenes in places according to a unified and coherent course of action respecting local conditions as well as interconnected functional systems.

The redesign of mobility infrastructure and public spaces is therefore significant. Quality of life and accessibility are indispensable for the new environmental role of public spaces. Indeed, conscious planning, based on the principle of sustainability and proximity, emphasises how major urban strategies are driven by community priorities. Thus, land use, its definition in the plan and the analyses carried out emphasise what future is envisioned for places and what ecological, climate and conservation covenants and challenges are to be addressed.

Rethinking the city is based on rebalancing the relationship between density, land use and sustainability, in which interventions transcend public-private space dichotomies through strategic spatial planning. It is not just a matter of identifying new ways of making cities, but of updating disciplinary paradigms through the synergy of extra-disciplinary knowledge. Urban planning, rather than supporting a wishful design, must be a process in which socio-economic dynamics, environmental issues and structural requirements are considered from the outset as priority conditions for the identification of sustainable urban projects. The intervention project (now more than ever) must demonstrate from the outset what objectives it intends to pursue and what benefits it can bring to wider contextual situations, in order to be validated as effective with respect to urban regeneration strategies. Urban planning will have to confront the question of 'coherence', not only with implementation tools, but also with spatial issues. According to this reading, the role of the plan becomes 'other' than the mere definition of areas, being enriched by new technical and scientific operations. The need arises to work jointly with standards and projects in which urban planning legislation introduces useful elements to pursue resilience issues for the city and the territory.

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Image Sources

Fig.1: Key component and benefits of proximity city. Author's elaboration.

Fig.2: Ecological transition and proximity city: the role of new public space. Author's elaboration.

Fig.3: Urban design framework. 2035 Comprehensive plan. Source: City of Portland (May 2023). Retrieved from: https://www.portland.gov/bps/planning/comp-plan-2035

Fig.4: Green hubs planned for the Barcelona Superblock programme. Source: Gerència d'Àrea d'Ecologia Urbana, Consell Municipal de Barcelona, BCN Ajuntament Barcelona. Retrieved from: https://bcnroc.ajuntament.bar celona.cat/ jspui/handle/11703/126250

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