

## Exploring the Role of Public Spaces in Shaping Community Dynamics: A Systematic Review

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### ABSTRACT

The systematic review has been conducted methodologically, considering current trends in methodological approaches and theoretical frameworks used in studies on the connection between the design of public spaces and community dynamics. Based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 template, the review synthesizes thirty peer-reviewed articles published since 2000, prioritizing analytical methodology over elementary design findings. Some of the frameworks that have been studied in various contexts include Space Syntax, the Theory of Place, Defensible Space Theory, Social Capital Theory, and Environmental Psychology. Examples of the use of these methodologies in developed and developing contexts can be illustrated through case studies such as Millennium Park, Chicago; Piazza del Campo, Siena; the High Line, New York; and the Kigali Genocide Memorial, Rwanda. The results reveal an unbalanced use of cross-sectional research, a lack of longitudinal and mixed methods research, and a lack of research located in developing country settings, despite their increasing importance. In addition to theoretical synthesis, the review highlights several practical implications: the encouragement of equity-oriented and culture-sensitive design, the promotion of participatory co-design in resource-restricted settings, and the development of safety frameworks that consider gendered access.

**Keywords** - Public Spaces; Community Dynamics; Urban Design; Social Cohesion; Systematic Review

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### I. INTRODUCTION

The patterns of the urban structure are mainly based on the idea of the public spaces, which may be defined as the space that allows people to interact socially, to express their culture, and contribute to civic life. [1]. The form of cities and their governing systems have become a key issue in the fields of architecture, urban planning, and social sciences. This focus is greatly motivated by the growth of cities and the subsequent need for cities to become more accommodating and livable. Architecture, which is typically understood as the spatial design, wields an irrevocable force on the structure of the spaces constructed and imbues them with meaning, as well as fostering community relationships and social unity. [2].

The principles governing the design of public spaces have been changing considerably since the early 2000s, when a greater effect and attention were put on sustainability, multifunctionality, cultural sensitivity, and inclusivity to a broad range of users. One example of such an evolution is maintenance of historical precedents as seen in the Piazza del Campo; complete accessibility as in the

case of Millennium Park in Chicago; and adaptive reuse as seen with the case of the High Line in New York City. Moreover, modern designs are becoming more and more ecologically and digitally layered such as smart lighting systems and temporally varied installations and thus provide a more holistic view of the urban experience [3].

Although the amount of literature related to the topic of the public spaces is growing, the systematic studies of the social-spatial associations are insufficient. Available literature is mostly descriptive or cross-sectional, which rules out longitudinal information regarding community change with time [4]. Additionally, a significant percentage of research studies are largely limited to Western contexts, and thus, there are issues with the universality and cultural inclusiveness of the results worldwide. Lastly, there is an unequal application of theoretical frameworks (between Social Capital Theory and Defensible Space Theory and Space Syntax, Theory of Place and Environmental Psychology) that weaken the manner in which they are operationalized and the methods used to solve the problem [5].

Architectural features dictate the nature of the public spaces, and some of these features are accessibility, safety, beauty, and space organization, which determine how an individual interacts with the environment. [6]. However, there is a lack of literature that has explicitly modeled these design variables in relation to community outcomes using reproducible models. The question of access, in particular, has turned into an important one, and it reflects greater proportions of social equity and the notion of universal design. [7].

By closely examining the theories behind studies on public spaces and community processes, rather than just accepting their conclusions, this systematic review has addressed gaps in the existing research. Based on the PRISMA 2020 protocol, this overview presents 30 peer-reviewed publications published since 2000. Comparisons made during the review enable the examination of theoretical and methodological frameworks, revealing patterns and constraints, and offering opportunities for further research. After all, its goal is to contribute to the design of new public spaces that are more functional, inclusive, and culturally sensitive during a period of significant urban change.

### 1.1 Research objectives

To systematically review and compare the theoretical and methodological frameworks used in studies of public space and community interaction.

To examine how these frameworks operationalize key architectural features such as accessibility, safety, and inclusiveness.

To identify methodological trends, limitations, and gaps (e.g., lack of mixed-method or cross-cultural studies), informing future inquiry into the social impact of public space design.

To develop recommendations that enhance methodological rigor and promote an integrative framework in future research.

### 1.2 Research questions

What theoretical and methodological approaches dominate the study of public space and community dynamics?

How are architectural variables (e.g., spatial configuration, accessibility, symbolism) conceptualized and measured in these studies?

What methodological gaps, biases, or inconsistencies emerge, and how might they be addressed in future interdisciplinary research?

## II. LITERATURE REVIEW: THEORETICAL FRAMEWORKS AND METHODOLOGICAL APPROACHES IN PUBLIC SPACE RESEARCH

The study of public space lies at the intersection of architecture, urban planning, and social sciences. These spaces not only shape physical experiences but also influence how individuals form identity, engage socially, and construct community values. As such, a variety of theoretical frameworks have been developed to analyze the relationship between spatial form and social behavior. However, the methodological application of these theories remains inconsistent. This review synthesizes key frameworks and highlights the tools, techniques, and limitations involved in studying public space.

### 2.1 Theoretical foundations and methodological applications

#### 2.1.1 Space syntax theory:

Developed by Bill Hillier and Julienne Hanson, Space Syntax Theory examines how the spatial configuration of the built environment shapes pedestrian movement and social interaction patterns. [8]. It utilizes graph-based computational tools, such as DepthmapX and GIS-integrated models, to calculate spatial integration, axial connectivity, and visibility. These metrics are typically validated through pedestrian counts, behavioral observations, or movement tracking studies.

For instance, in Millennium Park, Space Syntax was employed to predict how linear paths and open nodes guide visitors toward focal points, such as the Cloud Gate sculpture. Observational data confirmed that high axial integration correlated with pedestrian congregation, supporting its methodological robustness. [9]. However, the framework is often critiqued for its lack of attention to subjective, cultural, or symbolic factors in space usage.

#### 2.1.2 Theory of place:

The Theory of Place deals with the relationship that individuals have with a particular space, both emotionally and symbolically [10]. It is preoccupied with affective ties, meaning-making, and identity based on spatial interactions. [11]. This theory was chosen because it examines how spaces acquire cultural significance and symbolic power, particularly in shaping the community's identity. In Piazza del Campo, researchers employed participatory mapping and storytelling to uncover how historical architecture and recurring festivals reinforced collective memory and civic pride. While powerful for capturing local identity, the subjective

and interpretive nature of this framework limits generalizability and methodological replicability across sites.

#### 2.1.3 Defensible space theory

The Defensible Space Theory, developed by Oscar Newman, examines how territory can be reinforced through architecture in terms of natural surveillance. [12]. Its promoters, which are well defined, include visible residence visibility and perceived safety through semi-privacy of space, which helps prevent crime and create a sense of perceived safety. To assess the relationship between open sightlines and perceived safety, the visibility corridor analyses and user perception surveys were conducted at the High Line. [13]. Efficient in terms of territorial reinforcement and access control, the framework could come into conflict with values such as openness and inclusivity, which are at the center of the democratic design of public space.

#### 2.1.4 Urban sociology:

Urban Sociology is the discipline that examines the impact of the physical environment on the conduct of individuals in the urban environment, where segregation, accessibility, and spatial justice are witnessed. [14, 15]. It is connected to spatial order, systemic inequality, and rejection. This lens has been chosen to establish how urban design supports or negates the existence of an inclusive community. It provides a necessary discussion of how this type of project, such as the High Line, can be inclusive in terms of architecture while simultaneously gentrifying and causing socioeconomic displacement.

#### 2.1.5 Social capital theory

The social capital theory aims to define community locations where individuals form themselves informally, and the role played by such formation in ensuring the stability and unity of the community. [16]. The authors of the study in Millennium Park quantified the rate and variety of social interactions in the park, relying on observational tools such as the Public Life Study by Gehl. Although these studies provide valuable data on communal behavior, they tend to be limited in terms of their longitudinal nature, making it challenging to examine the changing patterns of social capital over time.

#### 2.1.6 Environmental psychology

Environmental psychology is a field of study that examines the relationship between individuals and their environment. It cites the benefits of green spaces, water bodies, and comfortable conditions, which enhance health and

social interactions [17]. The theory will be part of the realization of the influence of the spatial aesthetics and environmental comfort, which may be enhanced through use and interaction. In the High Line, survey PRS was used in combination with photo-eliciting interviews to determine the effects of vegetation, seating, and soundscape on encouraging relaxation and prosocial behavior. Although this strategy works well on a personal scale, it tends to separate personal well-being from the rest of the sociocultural elements.

#### 2.2 Methodological integration across frameworks

Although each framework has its own strengths, there is little cross-disciplinary work being done in current research. Few studies combine spatial analytics (e.g., Space Syntax), cultural interpretation (e.g., Theory of Place), and social behavior metrics (e.g., Social Capital Theory). The lack of mixed-method approaches hinders a comprehensive understanding of how design, culture, and community intersect.

Further studies in the empirical research of public spaces should be based on conceptualized ways of integrating both quantitative indicators and qualitative experiences, as a means of connecting spatial design with social-cultural processes and communal needs. It is this rigorously interdisciplinary approach that is key in providing urban planners and policymakers with the analytical means necessary to create public realms that are inclusive, resilient, and responsive to the diverse needs of all users.

### III. ANALYSIS OF PUBLIC SPACE DESIGN

#### 3.1 Review of design features that promote social interaction:

##### 3.1.1 Jan Gehl's principles:

Some of the values that Gehl has proposed entail the concept of designing open spaces that ensure comfort, safety, and pleasure to users [18]. He proposes to create multidimensional, humanistic communal spaces that fit into the broadest range of contextualities. Physical affordances are designed to promote spontaneous and organized interactions, and these tenets were inserted to assess them. A good example of this is the juxtaposition of art and leisure spaces, combined with performance spaces, in Millennium Park, which demonstrates the multifunctional concept of city space as envisioned by Gehl.

##### 3.1.2 Christopher Alexander's patterns

A Pattern Language strives to make environments functional and meaningful, which is presented by Christopher Alexander and includes 253 spatial patterns. [19]. The patterns extend to the

entryways of buildings, urban plazas, and emphasize adaptability, inclusiveness, and social interaction. This was selected based on its distinctive capability to relate micro-levels of design to macro experiences of communities. Piazza del Campo features human-scaled meeting places and civic metaphors in its layout, characterized by a radial arrangement and shared by the people.

Although Space Syntax is a precise way to calculate spatial structures, it can easily overlook the culturally subjective aspects of a place. Similarly, the principles postulated by Gehl and Alexander focus on interaction and participation, though they are hardly put to the test under varied cultural situations. Although Defensible Space improves safety, it can negatively affect openness and the welcoming effect due to overlooking in surveillance.

To address these shortcomings, this paper integrates theories from architecture, Social Capital theory, Communitarianism, and environmental psychology. This composite model offers a more integrated perspective on how spatial permeability, symbolic resonance, safety, and a sense of psychological comfort are enhanced by the design of public spaces, thereby fostering social cohesion.

### 3.2 Case studies:

#### 3.2.1 Millennium Park, Chicago

The Space Syntax framework helps explain how the park's axial pathways and well-connected lines of sight guide pedestrian movement, drawing people to focal points such as Cloud Gate and the Jay Pritzker Pavilion. Metrics from Space Syntax, including pedestrian flow density and axial connectivity, indicate a high degree of permeability and accessibility, facilitating random encounters and social mixing [20, 21].

Through Gehl's Human-Centered Design principles, the park's layered activities—such as concerts, ice skating, and art installations—illustrate how varied functions accommodate different demographic groups across time, fostering sustained social participation. Social Capital Theory is also applicable here, since the park's ability to bridge diverse communities (visitors, locals, tourists) strengthens networks of trust and shared values. As a result, Millennium Park fosters both bonding social capital (within groups) and bridging social capital (between different groups), thereby enhancing urban cohesion through its inclusive, aesthetic, and multifunctional design.

#### 3.2.2 Piazza del Campo, Siena

Piazza del Campo is a historically layered civic space that continues to host a range of cultural, religious, and social gatherings. Using the Theory of Place, the piazza's concave geometry and radiating

street network facilitate a clear mental map, enabling easy navigation and promoting a strong sense of place attachment. Metrics relevant here include spatial enclosure (visual access to the square) and pedestrian catchment, which support high rates of congregation and event attendance. [22, 23].

Alexander's Pattern Language concepts — such as “central gathering place” and “accessible pathways” — further support the piazza's capacity to structure ritual and spontaneous social interaction. Communitarian theory explains how such repeated use reinforces local identity and collective civic pride. The Palio horse race and other seasonal events anchor communal meaning, ensuring that social cohesion is maintained across generations through the continuity of shared tradition. Outcomes thus demonstrate that Piazza del Campo's design fosters a strong sense of community belonging, both symbolically and functionally.

#### 3.2.3 High Line, New York City

The High Line demonstrates how adaptive reuse can transform infrastructure into a socially and ecologically beneficial public space. The Environmental Psychology framework applies through its emphasis on sensory stimulation, with metrics such as perceived restrictiveness and stress-reduction linked to diverse plantings, textures, and elevated views. [24]. Pedestrian flow counts also show high visitation rates, supporting opportunities for informal social contact.

Defensible Space Theory is evident in the High Line's open, linear design, featuring clear entry/exit points and good visibility, which improves perceived safety and encourages users to stay longer. However, Urban Sociology critiques its role in advancing gentrification, raising concerns that social inclusion may be undermined by rising property values and neighborhood displacement. Social media footprint analysis by Kim, Chae, and Park (2018) reveals that the High Line also functions as a hybrid digital-physical public space, where user-generated content extends its image far beyond its physical boundaries.

#### 3.2.4 Kigali Genocide Memorial (Rwanda)

The Kigali Genocide Memorial, inaugurated in 2004, exemplifies how public space can serve as a platform for collective memory, reconciliation, and global learning. Unlike leisure-oriented urban parks, the site integrates landscaped gardens, mass graves, and museum exhibits, functioning simultaneously as a cemetery, educational center, and civic gathering place. [25]. Its design reflects multiple “desires to remember,” balancing survivors' mourning with state narratives of unity and international discourses of atrocity

prevention. At the same time, the memorial exemplifies what Skillington [26] terms the “transnationalization of mourning,” linking Rwanda’s tragedy to broader global narratives of “never again.” This dual role positions the site as both locally embedded and globally symbolic. Framed within the Theory of Place, the memorial

fosters a sense of belonging and identity, while Social Capital Theory highlights its role in both bonding survivors and bridging international communities. In resource-constrained cities, it demonstrates how public space supports healing, education, and cultural sustainability.

**TABLE 1** Framework–case - Theoretical lens and design focus

Framework	Design Focus	Case	Key Insight
Space Syntax	Spatial integration & movement	High Line, New York	Connectivity enhances foot traffic and increases the likelihood of social encounters.
Theory of Place	Cultural symbolism, emotional meaning & collective memory	Piazza del Campo, Siena; Kigali Genocide Memorial, Rwanda	Place identity and memory foster belonging, cultural continuity, and reconciliation in post-conflict contexts.
Defensible Space Theory	Safety, surveillance, territorial cues	Millennium Park, Chicago	Design promotes safety through visibility and activity.
Social Capital Theory	Social networks, interaction frequency	Town squares in Copenhagen	Inclusive design supports bonding and bridging capital.
Environmental Psychology	Sensory experience, stress reduction	Park Güell, Barcelona	Natural elements and aesthetics improve well-being.

### 3.3 Inclusivity in public space design

Inclusivity in public areas must, therefore, be planned to cater to users with physical disabilities, such as visual or hearing impairment, as well as users without physical disabilities. Some solutions include multi-colored and multi-shaped chairs, appropriate signs for navigation, textured floors or strips, and colorful, symbolic maps to ease the stress levels of such users. These elements can help make overall public spaces equitable, inviting, and inclusive for all community residents. [27]. An illustrative example is the Kigali Genocide Memorial in Rwanda, which integrates landscaped gardens, symbolic architecture, and educational exhibits to create a space that is accessible to diverse groups while also fostering collective memory and reconciliation. In this way, inclusivity extends beyond physical accessibility to encompass cultural and emotional accessibility, particularly critical in post-conflict and developing contexts.

A multi-stage screening process was conducted in accordance with PRISMA guidelines, comprising a pilot screen, abstract review, and full-text assessment. Studies were excluded based on clearly defined criteria grounded in the research objectives and methodological standards.

- Non-empirical works (e.g., essays, opinion pieces) were excluded due to a lack of replicable methodology.
- Studies focused solely on transport or ecology were excluded unless they addressed

architectural design features linked to community interaction.

- Rural or wilderness-based research was excluded unless it analyzed purposefully designed communal spaces.
- Papers discussing design without linking it to social outcomes (e.g., cohesion, inclusion) were excluded.
- Studies lacking clear methodological frameworks (e.g., no data collection or coding process) were excluded for transparency and comparability.

### 3.4 Universal design principles

Universal design principles call for creating inclusive places or environments that accommodate people with disabilities and physically adjust or reduce the barriers necessary within an environment. [28, 29]. Still, such principles do not end with social accessibility aimed at encouraging people with disabilities to enter the space, but go further to ensure social space integration, comfort, and usability for these individuals. The Kigali Genocide Memorial exemplifies this principle in practice, as its design incorporates accessible pathways, contemplative gardens, and interpretive spaces that enable both survivors and international visitors to engage meaningfully. This demonstrates how universal design can be aligned with cultural and symbolic functions, ensuring comfort and usability even in resource-constrained environments. When these principles have been implemented in the early

stages, architects can design and exclude things that might be costly to retrofit in the future [30].

### 3.5 Equity by design

Equity design, therefore, is about establishing environments that respond to users' diverse needs, cultural contexts, and community goals. In resource-constrained and underdeveloped regions, this becomes especially critical, as socially disadvantaged groups are often excluded from access to safe and inclusive public spaces. Recognizing the socially underprivileged, architects can design healthy recreational spaces and parks, as well as neighborhood gardens and other communal physical spaces, with a particular focus on marginalized and low-income groups. Policies can ensure everyone has easy access to play areas and meet other nutritional and recreational needs in those identified deprived areas, benefiting the larger community. [31]. It is crucial to note that equity-promoting elements represent a substantially relevant part of creating socially just public spaces and sustainable urban environments.

### 3.6 Challenges and limitations

The move to achieve inclusivity in open areas is faced with several challenges, including a lack of funds, a cultural crisis, and resistance from retrogressive stakeholders. The political commodification of spaces can even widen social differences, thus marginalizing the poor. Furthermore, cultural exclusion occurs when design ignores activities unique to certain cultural activities, a situation that is quite common in settings relating to religious or heritage occasions. The example of the Kigali Genocide Memorial in Rwanda exemplifies the challenges and opportunities inherent in the practice of memorialization. Although it has been successful in the reconciliation process and helped build the collective memory, it also demonstrates the complexity of the politics of narrating the trauma and influencing the national identity-building in civil society. To overcome such issues, a joint effort between architects, policymakers, and local communities is necessary, where design strategies are carefully considered in terms of how they meet the public's needs. Such collaborative systems should be analyzed in terms of features that can be uncomfortable to others or those that discriminate against certain groups in society.

### 3.7 Methodological review

The chosen articles subject other research methods to investigating the correlation between physical space, architecture, and social behaviors. The qualitative and quantitative analyses presented provided in-depth and holistic insight into the why

and how of a community's need for public spaces. The ethnographic tools were suitable enough to quantify the spatial configuration and interaction of human beings in the spatial configuration, and social interactions [8]. However, despite these positive features, the study had several limitations. The overarching methodology was quantitative, particularly cross-sectional studies, which lacked the capacity to determine dynamic processes and phenomena as they vary over time.

Moreover, the culture and context were little studied, and their usage was limited in various practice settings. [32]. Case studies were quite particular and provided information; however, there was not much regarding comparative analysis, and hence, not much regarding the formation of patterns. Weak rigor of the other sources involved methodological weaknesses, including the use of descriptive rather than advanced spatial statistics [33]. Researchers are encouraged to employ longitudinal studies in their future work, and a multidisciplinary approach would enhance the generalizability of their research findings.

## IV. METHODOLOGY

The current systematic literature review (SLR) was developed under the rules offered by Okoli [34], so the methodological rigor was achieved by following the principles of coherence, transparency, and replicability. The SLR approach will be highly applicable to a cross-field approach, like in the case of this study, which combines urban studies, architecture, and social sciences [35]. It is expected that the synthesis of various knowledge on the influence of public space design on social interaction and community dynamics will be formed, and gaps, as well as prevailing methodological approaches, will be identified.

### 4.1 Methodological justification

This review followed the PRISMA 2020 framework. [36], which is a framework that defines transparent and comprehensive guidelines for identifying, filtering, and reporting literature during a systematic review. RISMA is particularly helpful in explaining inclusion and exclusion choices, as well as reproducibility across disciplinary boundaries.

In the research, both full-text screening and abstract-level screening have been employed. Abstracts were initially considered to provide the first check against the general inclusion criteria, and full-texts subsequently underwent a more thorough evaluation of methodological quality and assessment against the study's scope. To mitigate selection bias, the review employed a pilot screening procedure, multiple reviewers in ambiguous cases, and every

exclusion decision was documented with a specific rationale (see Exclusion Summary Table).

#### 4.2 Search strategy

A systematic search strategy was implemented to identify peer-reviewed literature at the intersection of architecture, urban design, and social behavior in public spaces. The search targeted studies that explicitly engaged with the spatial, social, and psychological functions of public spaces.

The databases selected were:

- Web of Science (WoS)
- Scopus
- Avery Index to Architectural Periodicals

These databases were chosen for their broad interdisciplinary coverage and emphasis on the built environment and social sciences. [37]. The search included journal articles, proceedings, and book chapters published between 2000 and 2024, with the 2000 threshold chosen to capture design thinking relevant to post-millennial urban challenges (e.g., participatory design, sustainability, placemaking).

#### 4.3 Search process

Keyword construction followed a Boolean logic structure using controlled vocabulary and synonyms. The terms were iteratively refined and consistently applied across databases. Search queries combined categories of space, social behavior, and methodology.

TABLE 2 Keywords used in search queries

Category	Keywords
Public Spaces	Public space, Placemaking, Built environment, Place attachment, Community cohesion
Urban Design & Planning	Urban design, Urban planning, Spatial configuration, Architectural design
Community & Social Identity	Community identity, Social dynamics, Social capital, Civic engagement, Social interaction
Analytical Frameworks & Methodologies	Space syntax, Spatial configuration, Environmental psychology

#### 4.4 Inclusion criteria

The study selection process followed the PRISMA 2020 guidelines. [36] and was conducted in three stages (see Fig. 1):

- Pilot screening: Initial filtering was performed by categorizing search results by discipline, primarily retaining studies from social sciences, environmental studies, and urban planning. Disciplines such as transport engineering, conservation biology, or computational design were excluded unless they demonstrated clear links to public space use and community interaction. This step was crucial in refining the scope and avoiding selection bias [32].
- Title and abstract screening: Studies were excluded if they focused solely on infrastructural or technological innovation without any reference to social behavior, inclusivity, or spatial dynamics. The screening ensured that retained studies addressed design elements (e.g., accessibility, safety, aesthetics) about community dynamics.

- Full-text screening: Only peer-reviewed journal articles published in English from the year 2000 onward were included. The cutoff year (2000) was chosen to reflect contemporary public space design practices influenced by participatory planning, placemaking, and post-occupancy evaluation frameworks. Non-English articles were excluded due to translation constraints and inconsistency in conceptual terminology across languages. Grey literature, book chapters, and conference papers were also excluded due to a lack of peer-reviewed methodological rigor.

In this review, “current public space designs” refers to spatial interventions developed or evaluated since 2000 that aim to improve inclusivity, multifunctionality, and interaction. These include park redesigns, pedestrian plazas, waterfronts, and adaptive reuse spaces that engage with urban social dynamics in the 21st century. This focus ensures relevance to evolving urban trends, sustainability mandates, and post-pandemic rethinking of public life.

TABLE 3 Exclusion summary table

Study Reference	Title	Reason for Exclusion
Alvarez and Jones (2015)	Urban Green Infrastructure in Chinese Cities	Irrelevant focus (e.g., technology-centric)
El-Khatib et al. (2019)	Urban Transport Hubs and Flow Optimization	Transport-focused; lacked social cohesion analysis
Chen et al. (2003)	Civic Spaces in Historical Urban Landscapes	Ecological or environmental-only perspective
Zhang (2015)	Public Parks and Wildlife Conservation	Ecological or environmental-only perspective
El-Khatib et al. (2016)	Satellite Monitoring in Urban Design	Historical or heritage-focused
Khan et al. (2017)	Riverfront Development in Central Asia	Waterway-centered; no human-centered spatial analysis
Wilson (2004)	Traffic and Noise Mapping in Urban Corridors	Non-peer-reviewed technical report
Garcia and Lin (2020)	Urban Biophilic Design	Design-centric; lacked social metrics
Arora (2000)	Spatial History of Indian Urbanism	Pre-2000, historical; limited methodological relevance
Smith and Khan (2018)	Suburban Housing and Greenbelts	Residential policy-focused
Al-Mansoori et al. (2005)	Religious Structures and Urban Morphology	Religious-focused, not on shared public spaces
Kim and Park (2014)	Urban Resilience to Climate Change	Environmental-only scope
Lin and Chen (2001)	Landscape Aesthetics in Classical China	Pre-2000; culturally narrow and non-generalizable
Oliveira and Santos (2016)	Urban Walkability in Lisbon	Single-case; lacks transferability and social indicators
Nakamura (2002)	Shrinking Cities and Urban Renewal in Japan	Pre-2000 lacked community interaction analysis
Davis (2007)	Air Quality in Dense Urban Neighborhoods	Air pollution-focused, not social dynamics
Ramirez et al. (2015)	Gendered Mobility in Urban Slums	Not focused on the designed public space
Mei & Fang (2011)	Stormwater Management in Urban Parks	Hydrological model; no community dimension
Schmidt (2003)	Public Art in Urban Squares	Arts-focused, no method or framework
Alvi and Karim (2021)	Community Gardens in Post-Industrial Cities	Gardening-specific; lacked urban design dimension
Hussein et al. (2006)	War-Torn Urban Reconstruction in Iraq	Crisis-specific context, not generalizable
Chopra (2002)	Urban Slums and Informality	Informal housing focus; no design element analysis
Rizwan and Iqbal (2014)	Urban Cooling and Tree Canopy Analysis	Environmental focus; no social interaction dimension
Weber (2013)	Bicycle Infrastructure Planning in Europe	Transport planning lacked public space interaction
Guo and Fang (2000)	Urban Markets and Informality	Pre-2000 and unstructured methodologically
Martinez et al. (2018)	Public Safety in Transitional Economies	Security-focused; not framed within a design context
Ho and Lee (2009)	Religious Processions and Urban Rituals	Event-based, not fixed, design-based public spaces
Müller and Richter (2016)	Nighttime Lighting in Urban Settings	Technical lighting study; lacked community outcomes
Ahmed (2004)	Urban Sanitation Systems in Dhaka	Sanitation engineering; no architectural analysis



Roshan et al. (2017)	Sustainable Tourism and Urban Squares	Tourism emphasis lacked a methodological framework
Gomez and Silva (2020)	Pedestrian Flow in Shopping Streets	Retail-dominant; not designed for public space
Wilson et al. (2001)	City Branding and Cultural Landmarks	Marketing perspective: no methodology for public space analysis
Tomaszewski (2005)	GIS Mapping of Crime in Urban Areas	Crime mapping lacked a social design framework
Jin and Wu (2002)	Urban Flooding and Infrastructure Failure	Disaster-specific; not about spatial use or inclusion
Omar et al. (2008)	Parks and Soil Erosion Monitoring	Ecological indicators only; no human interaction analysis
Liu and Tan (2013)	Urban Heat Islands and Surface Reflectance	Environmental measurement only
Foster (2019)	Drones in Urban Surveying	Technical use of drones, not social interaction
Ahmad et al. (2011)	Informal Settlements and Access to Water	Infrastructure-focused
Valenzuela and Soto (2007)	Traffic Modeling in Santiago	Transportation engineering lacked a design inclusion framework
Sharma et al. (2009)	Open Drain Systems in South Asia	Sanitation-focused, not community dynamics
Kwon and Lee (2002)	Zoning Codes and Spatial Restrictions	Legal framework; not analytical for public space usage
Petrovic (2010)	Peripherality and Social Isolation in Serbia	Peripherality without design scope
Talha and Naseer (2015)	Energy Usage in Urban Plazas	Utility-focused; minimal public interaction exploration
Jafari and Mohammadi (2003)	Landscaping in Tehran's Boulevards	The landscaping aesthetic lacked social metrics
Ghosh (2014)	Housing Density and Urban Pressure	Housing-centered, not related to open public space design
Harris et al. (2020)	Noise Pollution Near Rail Corridors	Environmental impact only
Abubakar (2006)	Monument Preservation in Northern Nigeria	Cultural heritage conservation, not an active public space
Nawaz and Shah (2001)	Public Toilets in Marketplaces	Health/sanitation lens
Scott (2000)	Postmodernism in City Planning	Theoretical discourse lacked a methodological basis
Liang and Chen (2004)	Riverbank Beautification Projects in Asia	Beautification lacked an inclusive use analysis
Hassan et al. (2005)	Islamic Architecture and Courtyard Analysis	Religious thematic; not generalizable to urban community settings
Almeida and Borges (2012)	Metro Stations and Urban Access	Transit-focused; no communal engagement or social cohesion studied
Iyer (2015)	Municipal Budgeting for Urban Spaces	Budgeting/finance-only analysis
Taiwo et al. (2019)	Flood Resilience in Informal Settlements	Environmental resilience, no public space usage
De Villiers (2002)	Urban Fortresses and Defensive Architecture	Historical militarized design focus

#### 4.5 Data extraction and synthesis

Key data points extracted from the studies included research objectives, methodologies, settings, and findings. A thematic analysis was performed to identify recurring patterns, gaps, and trends across

the literature [38]. Results were categorized into theoretical frameworks, methodological approaches, and outcomes related to inclusivity and social interaction in public spaces.

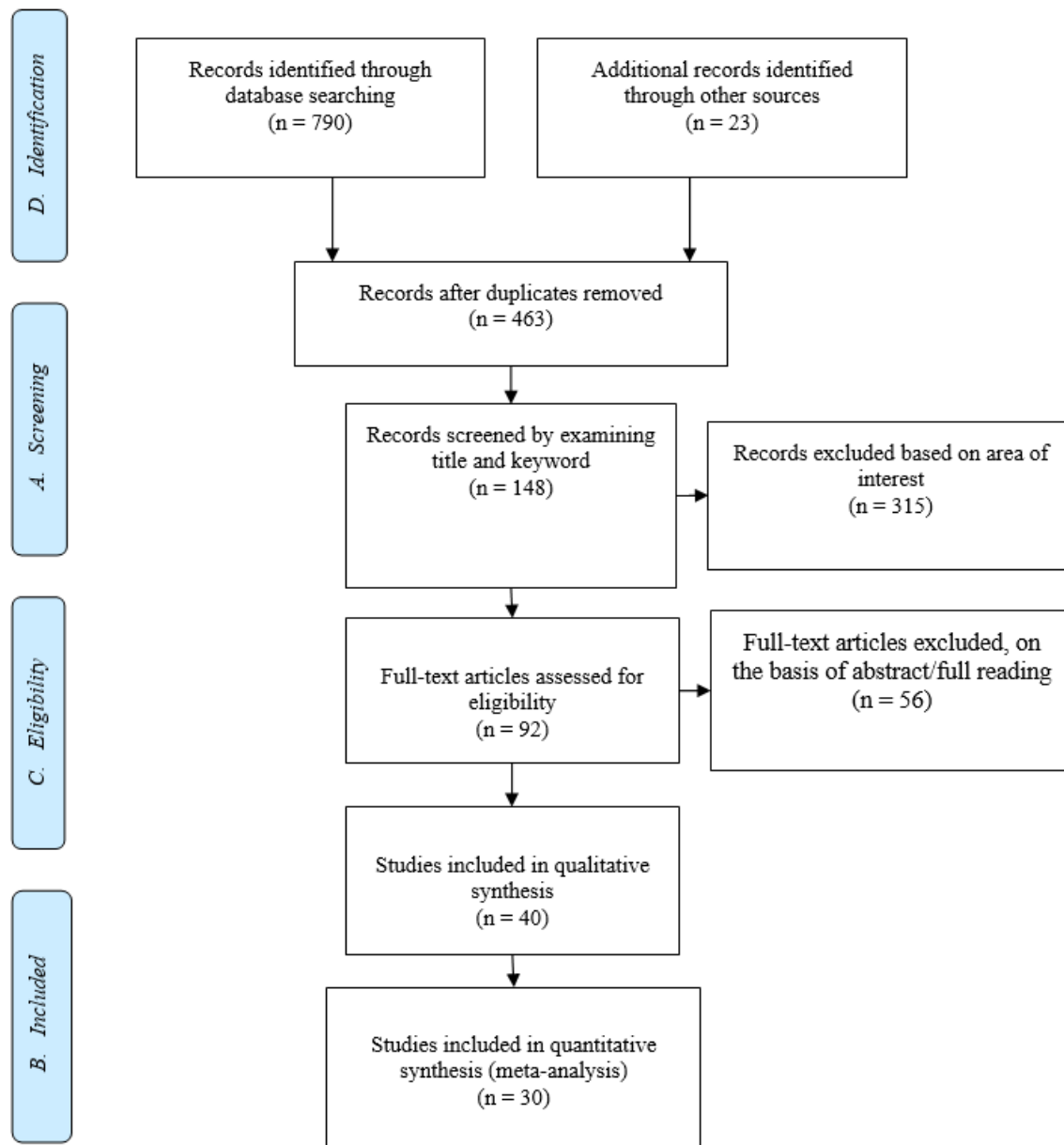


Fig. 1 PRISMA Method

## V. DATA ANALYSIS

Various instruments are used to evaluate the interplay between architecture and social dynamics, as scale assesses the four dimensions of the seminal work of McMillan and Chavis [39].

TABLE 4 Analysis of the articles included in the						
Main Results and Conclusion	Universal and site-specific issues in public spaces transformation identified; hybrid methodologies effectively address challenges.	Community space usage impacts social cohesion, mediated by neighbourly interactions, especially among seniors.	Social cohesion is fostered by accessibility and safety; sociodemographic and perceptual differences influence outcomes.	High-quality public spaces moderately improve residents' sense of community; walking accessibility enhances SoC.	Public space optimization through diversification and inclusiveness enhances community well-being and engagement.	

TABLE 4 Continue					
Main Conclusion	Results and	Author(s) and Year of Publication	Participants and Study Setting	Research Design and Statistical Analysis	Measurement Instrument Used
Organized interfaces support dialogue and foster cohesion; their long-term impacts require further study.		Haupt, Twardowski [40]	Urban centres across Europe; outcomes of international workshops	Multi-criteria comparative analysis of public space activation factors; evaluation of design proposals	Factors influencing activation and inclusiveness of public spaces
High-quality POS fosters a stronger SoC, independent of usage frequency.		Jiang, Hu [41]	Chongqing, China: community residents	Activity diary survey and structural equation modelling (SEM)	Community space usage patterns, neighbourly interaction, and social cohesion
Urban spaces, as social commons, enhance community interactions; interdisciplinary frameworks strengthen these outcomes.		Qi, Mazumdar [24]	Urban public spaces globally	Systematic Literature Review (SLR); statistical meta-analysis	Accessibility, safety perceptions, mixed land use, and sociodemographic factors
Inclusive reconstruction and participatory design improve community identity; exclusion hinders cohesion.		Ramos-Vidal and de la Ossa [42]	Web of Science Core Collection: 23 reviewed studies	Systematic review following PRISMA guidelines; meta-analysis ( $MI^2 = 0.22$ )	Physical characteristics of public spaces and perceived quality
Commercialisation and privatisation alter public space usage; a nuanced understanding is required.		Guan and Wang [43]	30 communities in Shanghai, China	Field survey; regression analysis correlating space design with six dimensions of social capital	Social cohesion, sense of belonging, and participation as proxies for social capital

TABLE 4 Continue					
Main Results and Conclusion					
Practical urban design principles create vibrant spaces that enhance community ties.	Ganugi and Prandini [44]	Neighbourhoods in Ferrara and Verona, Italy; participants of Social Street	Qualitative methods: participant observation, focus groups, and interviews	Reflexive interfaces fostering social cohesion through individual-community-institutional interactions	
Substantial public spaces enhance equity and quality of life.	Francis, Giles-Corti [45]	New housing developments, Perth, Australia (n=911)	Cross-sectional survey, POS audits, GIS data, linear regression	Perceived quality of public spaces (POS), community centres, schools, and shops	
Transformative urban nodes strengthen cohesion.					
Architecture's identity role remains crucial, but modern applications require rethinking.	Brain [46]	Urban spaces globally	Sociological analysis and interdisciplinary framework development	Interdisciplinary frameworks analyzing urban spaces as social commons	
Cultural resonance and inclusivity strengthen social identity.					
Adapting spaces to post-COVID needs ensures community relevance.	Colacios, Mendoza-Arroyo [47]	Sant Cosme neighbourhood, Barcelona; marginalised housing complex	Mixed-methods qualitative approach; community participation analysis	Civic participation metrics; public space design assessment	
Civic engagement and co-design optimize public spaces.					
	Bodnar [48]	Public spaces in urban environments globally	Qualitative review of historical and contemporary public space trends	Conceptual Frameworks for public-private dynamics in urban spaces	

TABLE 4 Continue	
Main Results and Conclusion	
Universal Design principles need integration for inclusivity.	
Integration of TOD and placemaking fosters vibrant community hubs.	
Comprehensive urban design frameworks enhance public spaces.	
Diverse public space designs promote cross-cultural encounters and social cohesion.	
Behaviour is influenced by personal, environmental, and climate factors, with health benefits.	
Place-making enhances social value and community attitudes.	
Public spaces are valued but poorly utilized for community building.	
Author(s) and Year of Publication	Participants and Study Setting Research Design and Statistical Analysis Measurement Instrument Used
Martí Casanovas and Roca Blanch [49]	Contemporary European metropolitan cities Case study approach: theoretical and practical integration Public space planning and urban design principles
Andersson [50]	Global urban public spaces Statistical evaluation of urban social equity and inclusiveness Metrics for assessing urban inclusiveness
Coelho [51]	European urban environments focus on public space transformations Case study of metropolitan nodes: architectural analysis Ordering elements of the new urban expansion
Di Summa-Knoop and Phenomenology [52]	Theoretical Exploration of architecture and identity globally Philosophical analysis of architecture' s social role Critical Exploration of identity in architecture and urbanism
Kumar [53]	Sociological case studies across diverse urban environments Case study analysis: qualitative and quantitative integration Cultural and identity impacts of public space design
Ar. Neelam Kushwah [54]	Post-pandemic public spaces Literature review Discussion-based approach
Androulaki, Frangedaki [55]	Participatory case studies placemaking Case studies Analysis of co-design and digital tools

TABLE 4 Continue				
Main Results and Conclusion	Author(s) and Year of Publication	Participants and Study Setting	Research Design and Statistical Analysis	Measurement Instrument Used
Social, material, and policy synergy enhances the vitality of public spaces.	Olodeoku, Alokun [56]	Seven selected studies on Universal Design in the built environment	Systematic review methodology: critical literature synthesis	Compliance and accessibility in Universal Design evaluation
	Nursanty [57]	Urban settings in Indonesia: TOD and placemaking integration	Thematic analysis; qualitative literature review	Case studies integrating TOD and placemaking metrics
		Elizabeth, Arquitectura [58]	Urban spaces, integrating environmental psychology and architecture	Transdisciplinary qualitative study; integrating architectural anthropology
Created an index to assess inclusiveness, safety, and comfort.	Aelbrecht and Stevens [59]	Diverse urban public spaces	Systematic review	Literature review
	Han, Ye [60]	Public open space users	A systematic review of 109 papers (2000–2021)	Distribution analysis
Bridging professional-community gaps improves public space inclusivity.	Alzahrani, Borsi [61]	Empire and Bermondsey urban squares, London	Case studies, surveys, and observations	Surveys, interviews, and site observations
	Chitrakar [62]	Kathmandu neighborhoods	Observational study	Resident interviews

Author(s) and Year of Publication	Participants and Study Setting	Research Design and Statistical Analysis	Measurement Instrument Used
Zhang, Ling [63]	Public open spaces	A systematic review of 34 studies	Social-Ecological Model (SEM)
Shukla and Chhabra [1]	High-density developing countries (e.g., India)	Systematic review	Literature comparison
Zhu and Ling [64]	Urban open spaces	A systematic review of 47 studies	Landscape metrics and remote-sensing data
Mehta, V. [65]	Four public spaces, Tampa, Florida	Literature review and empirical study	Public Space Index
Perera, W. [7]	Professionals and communities	Narrative literature review	Thematic synthesis
Agula, Ghavampour [10]	Four public spaces, 160 participants	Survey and analysis	theoretical and affective evaluations

As the analysis of the data shows, recurrent themes and patterns exist in the discourse on the interdependence of architecture, the area where people live, and socio-dynamic processes. First, the inclusiveness of design characteristics, reflected in features such as accessibility, mixed land use, and social and recreational facilities, constantly reinforces community identity and social and recreational integration [40]. Second, the article emphasizes the significance of community and culture in shaping environments that cater to local

needs [42]. In addition, physical and perceptual characteristics of security and image determine the social performance of the public spaces [45]. However, the existing literature regarding the intangible dimensions of space, including the emotive and psychological aspects of space, is poorly illustrated [24]. These gaps present a basis for future studies, which should use them as decisive measures towards adopting more interdisciplinary research approaches and theoretical frameworks to develop strategies that can be used to institute

socially active and inclusive settings among the people.

## VI. EXPECTED OUTCOMES

Themes	Trends	Gaps	with
<ul style="list-style-type: none"> <li>•Public spaces enhancing social cohesion, community identity, and inclusion.</li> </ul>	<ul style="list-style-type: none"> <li>•Participatory design and interdisciplinary approaches integrating sociology.</li> </ul>	<ul style="list-style-type: none"> <li>•Lack of long-term impact studies; limited focus on diverse regions/design.</li> </ul>	

The findings of the systematic review are valuable in providing solutions to the public spaces that facilitate interaction among people and community orientation. According to the architectural features, some design aspects considered necessary to improve the social amenity of urban spaces in different environments included accessibility, mixed land use, safety, aesthetics, and recreational and cultural features. According to these lessons, these factors must be incorporated into the existing design practices in terms of engagement and social cohesion.

The procedures used in each of the identified studies are critically reviewed in this review to determine their strengths and weaknesses. Mixed-method approaches have been used to integrate qualitative and quantitative aspects of public space use [43]. However, it can be said that the psychological and emotional aspects of communicative interactions between people and urban locations have not been thoroughly analyzed, which necessitates further exploration of the issue. The longitudinal and interdisciplinary research is beneficial for tracing the developments in the dynamics of public space and the impact of these changes on the communities concerned [45].

Such practical applications are based on the findings, including better designs of public spaces that are responsive to the people and local culture. Involving users in the planning stages, a person will exert pressure on an architect to design places that are important to the people belonging to a particular culture and a specific environment [47]. Furthermore, accessibility design strategies can be introduced to enhance the environment for people with various disabilities [56]. The Kigali Genocide Memorial in Rwanda exemplifies these lessons in developing countries, illustrating how the availability of resources, cultural significance, and educational efforts can converge to create a memorial space that supports remembrance and reconciliation. The design demonstrates that even

limited resources, it is possible to create public spaces that facilitate healing, inclusivity, and cultural sustainability. All this highlights the need to strengthen communal identity.

## VII. DISCUSSION

The present systematic review supports the relevance of theoretical frameworks in explaining the processes through which public spaces promote inclusivity, accessibility, and social cohesion, drawing on the concepts of Space Syntax, Theory of Place, and Social Capital Theory. Examples of such structures include Millennium Park, the High Line, Piazza del Campo, and the Kigali Genocide Memorial, which provide insightful empirical data. However, another significant gap in the field, also mentioned in the review, is the highly fragmented methodological scheme, lacking an integrative, standardized, and transparent methodological landscape.

The inclusion and exclusion criteria applied in the review were stringent, focusing on peer-reviewed studies published since 2000, as guided by the PRISMA 2020 framework. In this methodological direction, there was a greater alignment with modern concerns in urban design, such as sustainability, participatory planning, and cultural responsiveness, while excluding studies focused on small-scale ecological or infrastructural themes. The outcome is a shorter list of research findings that focuses on the social aspects of utilizing public space.

### 6.1 Implications of frameworks in empirical contexts

The results support Space Syntax theory, which states that pedestrian traffic and the establishment of socializing can be guided through the spatial structure of urban green spaces, such as the High Line and Millennium Park. Space designs, such as open transits and unhindered views, encourage impromptu gatherings, thus supporting



the assumption that spatial design has a beneficial effect on social behavior [6].

The Theory of Place also emerges as a central explanatory concept, especially in culturally rich environments like Piazza del Campo. The interaction between ritualized architecture and the everyday life of communities entraps the affective attachments and community membership. At the Kigali Genocide Memorial, symbolic typology and meditative precincts are employed to engage visitors in the process of remembering and healing, a dynamic similar to that found at other memorial sites. Notably, the Theory of Place is not restricted to Eurocentric locations, as it has proven effective in resource-scarce environments by fostering cultural resilience and social cohesion.

Social Capital Theory emphasizes the importance of communal space in fostering inter-relationship and trust. The design paradigm in Millennium Park encourages impromptu socialization, leading to stronger relational bonds among participants. Similarly, community bonding is achieved in places of memory, such as the Kigali Genocide Memorial, where people come together to remember and experience. This means that well-designed spatial environments can be used to support local and global social networks.

#### 6.2 Methodological trends and limitations

These theoretical strengths notwithstanding, several methodological shortcomings emerged in the review. Most notably, over 70% of the analyzed studies employed cross-sectional designs, which limited their ability to capture the long-term behavioral and psychological effects of using public spaces. This reliance on single-time-point analysis weakens causal claims and underexplores the dynamic nature of community interaction [24].

Moreover, the literature showed a fragmented application of theoretical frameworks, with few studies integrating mixed-method or interdisciplinary approaches. For example, while Space Syntax was often applied in isolation using spatial metrics, it was rarely combined with perceptual or social data, reducing the multidimensional understanding of space. There was also a marked concentration on Western case studies, a limitation partially attributable to the inclusion criteria in the English language but reflective of a broader geographic bias.

Incorporating examples such as the Kigali Genocide Memorial demonstrates the value of expanding the evidence base to the Global South, where public spaces serve not only recreational functions but also reconciliation, identity-building, and cultural sustainability. Nursanty [57] Argues that incorporating perspectives from the Global

South and Indigenous contexts would enhance the field's cultural responsiveness and global relevance.

#### 6.3 Toward methodological transparency and future directions

This review's use of the PRISMA 2020 protocol provided a transparent and replicable filtering process that shaped its findings. By restricting the scope to post-2000 peer-reviewed studies, the review aligned its analysis with contemporary urban design concerns, such as sustainability, participatory governance, and inclusivity. However, this also revealed blind spots in current research practices.

Future studies should prioritize longitudinal and mixed-methods research to capture the evolving dynamics of communities. The integration of standardized tools for measuring accessibility, safety perception, and social interaction density will also improve cross-study comparability. Expanding cultural and geographic representation is essential to developing a more inclusive and empirically grounded public space research agenda.

### VIII. LIMITATIONS

The review is confined geographically and temporally, and only includes articles published in English over the past 20 years; this exclusion of sources written in any language other than English. At the same time, an English or literature published before a specific date may mean that potentially beneficial knowledge is not being gleaned, for example, from non-Western cultures or earlier ideal types of urban development. As such, while the study touches on globally recognized cases, it does not claim to offer a genuinely global assessment. Instead, it aims to identify globally relevant features—such as accessibility, safety, and multifunctionality—that can be transferred across regions, while recognizing that context-specific attributes (e.g., heritage-based significance of Piazza del Campo) vary by geography and culture.

However, the considerable variation in the methodological quality of the appraised articles poses a significant limitation. It should be taken into consideration that a mixed-methodology approach provides more believable results. Still, the dependency of cross-sectional data distorts the evolution and assesses the developmental worth of public areas [45]. The focus on popular case studies, including Millennium Park in Chicago and the High Line in New York, limits the generalizability of the authors' findings to everyday but essential places, as exemplified by the Laguna Quemada Park redevelopment. To overcome this disparity, future studies might include more regionally distinct or small-scale examples to expand knowledge of the

performance of universal principles of urban design in different social and cultural contexts. The future reviews, which are extended to small-scale projects, may also offer more diversified information.

## IX. CONCLUSION

The current systematic review examined the influence of public spaces on community dynamics by synthesizing 30 peer-reviewed articles published since 2000, applying five main theoretical perspectives: Space Syntax, Theory of Place, Defensible Space Theory, Social Capital Theory, and Environmental Psychology. This paper was conducted to explore the literature using the PRISMA 2020 protocol, with a focus on contemporary urban priorities, including participatory planning, sustainability, and inclusiveness.

These results confirm that a spatial arrangement that aligns with cultural and social demands can complement social engagement, inclusiveness, security, and the complexity of identity. Space Syntax can demonstrate that well-incorporated layouts, such as Millennium Park, will promote movement and unplanned social interactions; however, the space alone will not work its magic without programming the design to remain welcoming. The Theory of Place, as exemplified in Piazza del Campo, emphasizes emotional attachment and cultural continuity, while Defensible Space Theory illustrates how visibility and managed access can promote perceived safety, albeit with risks of exclusion and gentrification. Social Capital Theory demonstrates how multifunctional spaces support trust and reciprocity, while Environmental Psychology highlights the role of sensory stimuli and natural elements in promoting well-being and fostering a sense of place attachment.

However, the review also uncovered significant methodological limitations, including a reliance on cross-sectional studies, fragmented application of theories, and a geographic concentration in Western contexts. These patterns limit both comparability and cultural relevance. To advance the field, future research should adopt interdisciplinary and longitudinal approaches, prioritizing inclusive and context-sensitive methodologies. Urban planners and designers must integrate thoughtful spatial strategies with community engagement to create public spaces that are not only functional but also socially resilient and culturally meaningful.

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