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Collaborative Spaces in Relation to Residential Well-Being: Evolution, Typologies, and Challenges—The Case of Almaty

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Abstract

Rapid and often chaotic urbanisation in post-Soviet cities such as Almaty challenges the quality, availability, and accessibility of public spaces for residents, given the cities' historical development. Meanwhile, global research is focused on the concepts of Third Places, coworking spaces in the Western context, and urban experience in cities with transitional economies, but the heritage of centrally planned urban development lacks spatial explicit analysis. The purpose of the current study is to analyse the evolution, current situation, and distribution of collaborative spaces (public spaces that combine work and connectedness) in Almaty. The methodology includes four phases of qualitative analysis: (1) a historical–typological analysis of architectural functions since the beginning of the 20th century until the 2025, (2) spatial mapping analysis of the existing typologies such as libraries, museums, coworking spaces, research and development (R&D) institutions and universities, and community centres, (3) longitudinal statistical analysis, and (4) historical graphic analysis. Analysis is conducted through the lens of advanced levels of human needs that concern self-education and self-development. This approach helped to propose a new definition of collaborative space. The results also show examples of sustainable urban structure with collaborative spaces in Almaty's old centre ("Zolotoi Kvadrat"—Golden Square) and a critical deficit of new multifunctional spaces for work and socialisation in recently developed districts. The study reveals that Almaty's evolution occurred through incremental infill development over the old grid, without the integrated development of the public realm and existing structural connections. As a result, the research explores the connection between collaborative spaces and their indirect influence on the general well-being in Almaty.

Keywords: collaborative space; Almaty; well-being; third place; architectural mapping

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1. Introduction

Rapid urbanisation drastically transforms the social and spatial structure of contemporary cities, increasing pressure on urban social infrastructure, public spaces, and the quality of the urban fabric. Recently, the relationship between urban space and human well-being has become increasingly important among architects and urban researchers. Along with reliable transportation systems and sustainable housing, modern cities need to provide spaces for collaboration and social life, and to promote well-being, to make the urban environment more comfortable. Almaty exhibits many of these challenges.

1.1. Urbanisation Trends and Population Growth in Almaty

The city began as a small settlement and grew throughout the 20th century, evolving into a major post-Soviet city in the foothills of the Zailiyskiy Alatau. Almaty has experienced steady growth from 2000 (1.13 million) to 2025 (2.29 million), an increase of almost 100% according to the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan (https://stat.gov.kz/). These trends substantially exceed the demographic projections in the city's General Plan (Master Plan), adopted in 2002, which projected a 2020 population of 1.3 million [1]. Although the capital of Kazakhstan was moved from Almaty to Astana in 1997, Almaty retained its status as the "South Capital", being the largest socio-economic hub in Kazakhstan.

Historically, Almaty developed according to relatively coherent urban planning principles, with a strict rectangular road grid and human-centred street planning. Due to its mild climate and well-organised urban fabric, the city felt comfortable enough to host new residents, especially after Almaty became the capital of the Kazakh Soviet Republic in 1929. Starting in the 1960s, multiple micro-districts emerged around the city, providing essential infrastructure for public spaces.

One of the main urban design principles during Soviet times was architectural "ensembleness", which aimed to integrate residential, social, and cultural infrastructure into a unified urban composition [2,3]. On the other hand, this approach is most efficient under the centralised political and economic systems (planned economy).

However, following the transition from a centrally planned to a market economy in the 1990s, Almaty experienced rapid, often fragmented spatial growth. Extensive infill construction, commercialisation of land, and decentralised urban development may have weakened the coherence of the urban fabric and decreased the number of public and socially oriented spaces around the city. While the city experienced steady population growth and the expansion of commercial activities, many urban areas lacked spaces for collaboration, social activities, and community life. Infill construction and the introduction of new functions within the existing urban fabric may have disrupted the established urban planning logic. Existing facilities were functionally limited, while new development patterns prioritise economic efficiency over urban comfort and social infrastructure. With the growing importance of public space availability, there is a clear gap in research on the planning structure of public spaces in Almaty [4].

Nonetheless, recent studies show that the old city centre remains a hub of social and economic activity, while peripheral districts have low levels of such activity [5]. Furthermore, it is suggested that the city has a strong urban grid in the old centre with multifunctional use, business centres, and balanced residential blocks [6]. These trends bring more public and collaborative spaces to the old city centre. The urban fabric and structure of Almaty's city centre are under overwhelming pressure due to the high number of attractive public spaces, despite its functional planning and historical significance [7].

1.2. Increasing Demand for Social Well-Being

These transformations are particularly significant given the growing importance of social well-being in urban environments. Before the 21st century, health and well-being were understood only in terms of the biological and physical dimensions of human existence [8–10]. The modern understanding of health and well-being states as follows: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" [11]. Previous studies show that social interactions, community participation and interpersonal connections positively influence mental health and well-being [12–15]. These social connections can range from close ties with friends and family to those with coworkers and others we work with on short-term projects. Gallup's

data show that having a best friend at work can influence employees' job satisfaction and other aspects of their experience [16]. Finally, there is a clear need for space for people to interact with one another at many levels, especially when collaborating on projects.

City residents spend most of their time at work, at least 40−50 h a week. However, researchers identified a strong occupational balance as a key factor in achieving high levels of well-being [17,18]. At the same time, we spend a considerable amount of time indoors.

Concepts such as Third Places, introduced by Oldenburg, describe environments that exist between work and home and support informal social interaction and community life [19]. More recently, researchers have been exploring hybrid and multifunctional environments—such as coworking spaces, libraries, educational hubs, and creative workplaces—that provide professional, educational, and social spaces that foster collaboration and social well-being [20,21]. Nonetheless, the concept of Third Places is well represented in sociological studies and is rarely linked to the physical architectural environment in the context of urban development.

Although there is extensive research on public spaces, occupational balance, social well-being and Third Places, limited attention has been given to collaborative spaces as an essential part of the urban environment and social infrastructure. Addressing this gap, the current study explores their role in the contemporary urban environment.

1.3. Lack of Collaborative Spaces in Urban Environments

While Third Places conventionally arise from existing structures and typologies, newly developed districts usually lack such social infrastructure and require a specialised approach to creating spaces that combine workplaces with Third Place qualities. The current paper explores an alternative typology to achieve the best occupational balance, integrate with the work environment, and promote social activities. Such spaces may also arise from existing spaces (cafes, offices, etc.) or stand as a separate typology warranting further research.

Collaborative spaces such as coworking spaces, libraries, universities, etc., are globally investigated in the context of the urban environment and its influence on well-being. Nonetheless, post-Soviet cities, such as Almaty, lack rigorous research in this context. Since the beginning of the 20th century, Almaty has seen an evolution of the typology of public spaces dedicated to leisure, business, and daily use. The transition from the 20th to the 21st century in Almaty necessitated personal space and personal development. Hence, there was an urgent need for spaces dedicated to self-expression and personal development that also provide sustainable social infrastructure. The present study examines the city's development through the lens of new typologies that have emerged over the last hundred years. These spaces have set the origin for collaborative spaces.

Although the Soviet model of residential blocks has provided social infrastructure in Almaty, it did not include the various social and mixed scenarios (work/leisure/home) that are becoming urgent in big cities at present. During the last decade, this problem has become more alarming. The quality of city infrastructure and architectural comfort, safety, aesthetics and functional diversity is considerably low [6]. Civic initiatives often emphasise that new social infrastructure and Third Places are absent within new residential blocks, which may lead to social disunity [7]. Furthermore, most initiatives, for instance, smart city developments, often focus on engineering and transport infrastructure, neglecting social comfort in Almaty [22]. Most research considers the problems of the city through isolated lenses, such as transport load [5]. This may lead to urban discomfort, despite the potentially high standards of living in residential blocks.

It is unclear how the present Almaty development patterns limit the creation of effective collaborative spaces that can provide sustainable social infrastructure and new workplaces in the city.

Despite the growing international interest in collaborative spaces and multifunctional urban environments, the research within the post-Soviet region remains limited. Additionally, recent studies show trends of hybridisation and multifunctional use within urban environments. A combination of work and social spaces is widely discussed in the literature and is often referred to as new workplaces or collaborative spaces [20,21].

On the other hand, limited research has examined how collaborative spaces operate as architectural, social, and urban infrastructure that connect work, socialisation, and residential life, thereby providing greater comfort and enhancing well-being. Almaty, as a rapidly developing post-Soviet city, exhibits such limitations in research at the time.

1.4. Defining Collaborative Spaces in Architectural and Urban Contexts

The definition of collaborative spaces is widely discussed in the business literature and the information technology (IT) field, yet it is rarely used to define the typology of space from an architectural perspective. The current paper considers the concept of collaboration within physical architectural environments that facilitate it. One of the goals of the present study is to define the term "collaborative space" within the context of the architectural and urban environment. This is important because collaborative spaces, as part of social infrastructure, tend to attract social and business activities.

Emerging trends in coworking spaces within urban environments show that the conventional perception of company workflows is shifting towards more adaptive approaches. While the concept of coworking went through several stages of development, initially appearing as people working in cafes, a newly established typology of coworking space was founded by Brad Neuberg and opened in San Francisco in 2005, creating a new opportunity for people from different backgrounds to work and socialise in one environment [23]. Such spaces may have appeared haphazardly across the city, presumably due to the rising number of self-employed specialists and freelancers. While big companies are creating more comfortable, inviting spaces to retain employees longer, these spaces tend to be less corporate and offer a wider range of amenities for all users—lounge spaces, waiting rooms, conference halls, etc., span across offices. On the other hand, new typologies appeared to answer the need for temporary use of space.

The current paper attempts to define the term "collaborative spaces" in the context of Almaty's post-Soviet urban development, as one of Kazakhstan's largest cities, which has rapidly developed over the last century.

On the other hand, it may appear that the emergence of collaborative spaces is linked to increased residents' leisure time. However, it may be otherwise too. Since the 2019−2020 pandemic, when social interaction declined, the importance of such spaces has sharply increased. Radical changes in ways of living, focused on individualisation, spatial enclosure, and excessive virtuality, influenced the human need to socialise more, to change the work environment, and to switch between activities in an enclosed environment.

Furthermore, as the city's population has grown, its inner organisation has changed as well. Extensive saturation with technical equipment for organising everyday life, health, and the workplace of a student or an adult undoubtedly increases the comfort of the living space and facilitates many processes. However, excessive individualisation of daily processes emphasises the need for social interaction, connectedness and presence of community. Such necessities are often satisfied within collaborative spaces.

2. Materials and Methods

2.1. Methodology Overview

The current study takes a new holistic approach, considering the intersection of the sociological concept of Oldenburg's Third Places, the development of architectural typologies in Almaty, and the concepts of well-being and health. The scoping literature review summarised information on each concept considered, including the historical development of Almaty, drawing on a well-read list of authors working in architecture and architectural history. The review was conducted using the Scopus, Web of Science and Google Scholar databases between January 2025 and March 2026. The search used a combination of terms: "collaborative space", "well-being", "social well-being", "urban well-being", "social infrastructure", "Third Place", "Almaty" and "architectural mapping". Publications included in the scoping review were published between 2000 and 2025. Earlier works were also included to strengthen the theoretical foundation for concepts such as public space, Third Places, well-being, and collaborative environments. Studies were included if they examined connections among collaborative environments, public spaces, social interactions, and urban well-being. Non-peer-reviewed publications were excluded. Additionally, selected policy documents, reports, and media publications were consulted to provide the local context of Almaty's modern urban environment challenges and emerging collaborative spaces. It is important to note that these sources were not used in the scoping literature analysis; they provided supplementary information about the local background. The current study presents an exceptional historical analysis of public space typologies that have evolved in Almaty from the 1910s to the present, showing significant shifts and the emergence of new typologies almost every decade. The process combines visual collaging and the classification of typologies that have appeared across the city over the last century.

This research employs qualitative, holistic research design methods to explore the evolution, distribution, and typological characteristics of collaborative spaces in Almaty, and their connection to the concept of well-being. The qualitative approach selected for the study is well-suited to investigating the in-depth evolution of collaborative spaces, typological changes over time, historical processes, and social behaviour that are difficult to document through quantitative research methods alone [24]. The study focuses on understanding where collaborative spaces are allocated, why they emerged in specific patterns, how they function architecturally within the urban environment, and what lessons they can bring for future developments.

The current study integrates four phases of investigation: (1) historical and typological retrospective presenting the evolution of collaborative spaces typologies in Almaty from the early twentieth century until the 2020s, (2) spatial mapping analysis demonstrating the distribution of collaborative spaces across the city's urban fabric [24], (3) longitudinal statistical analysis of collaborative spaces in Almaty, and (4) historical graphic analysis of collaborative spaces. The methodology overview is illustrated in Figure 1, which shows the combination of theory and architectural analysis.

Figure 2 illustrates the time frames of the current study. The diagram illustrates the shift in human needs, from basic physiological and protective functions towards more complex spatial, social, and self-realisation and self-development needs. Early architectural and urban development in Almaty was primarily focused on fundamental needs, such as protection against external environmental conditions and the provision of essential living functions. Later, the architectural design was developed to satisfy higher levels of human needs, such as socialisation, zoning, and the appearance of auxiliary spaces (Table 1). Further, in the second phase of the investigation, which includes the spatial analysis of developments over the last decade, the authors sought to emphasise the contemporary transition toward an adaptive, human-oriented, and socially friendly architectural

and urban environment. To examine more recent developments in collaborative spaces, a statistical analysis was conducted from 2006 to 2025. The figure positions the research within the broader historical evolution of collaborative spaces whilst clarifying the focus on current challenges, emerging trends, and priorities in collaborative spaces design.

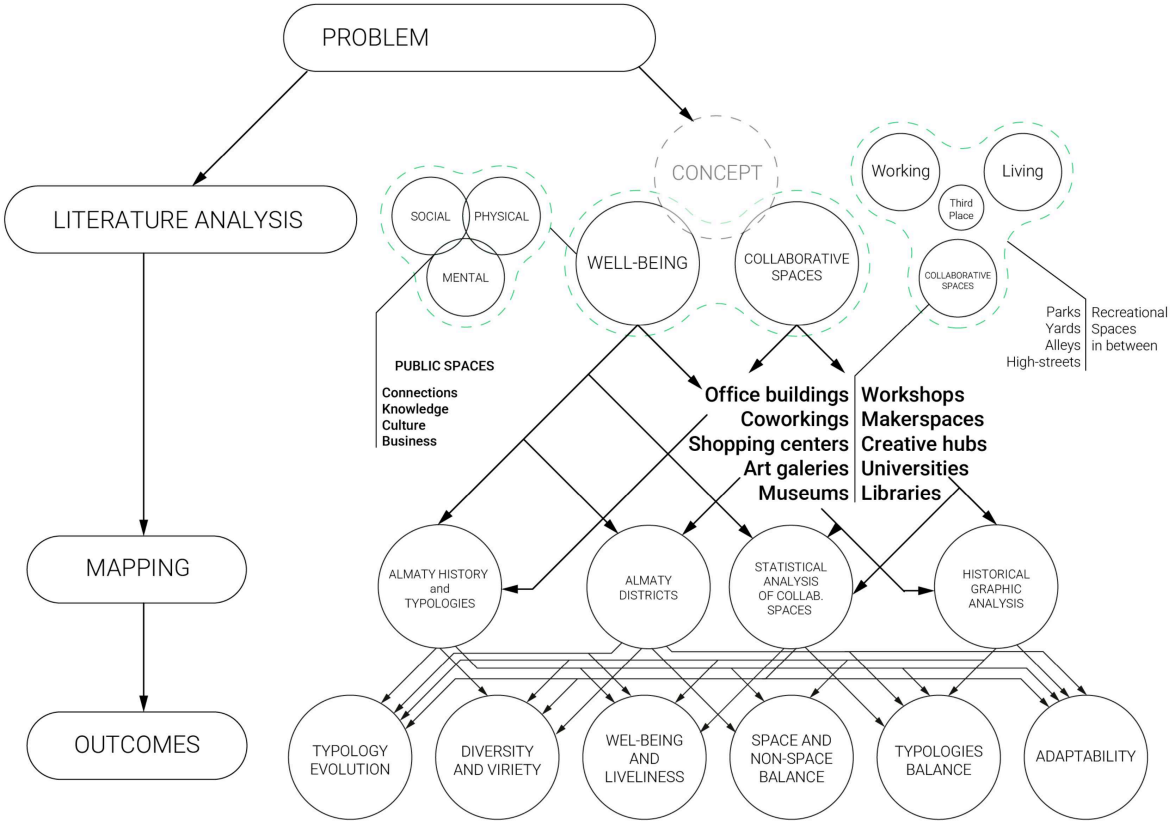

Figure 1. Methodology overview.

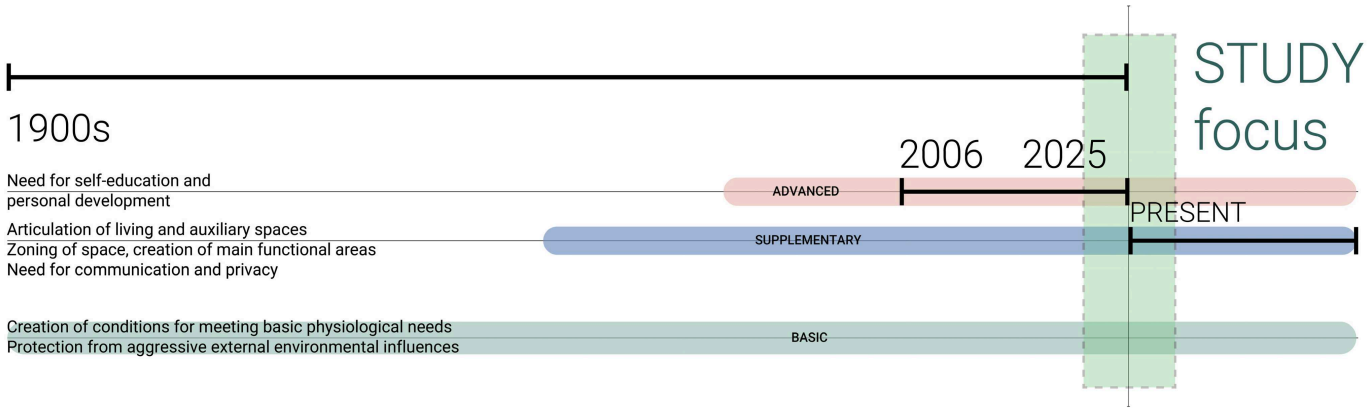

Figure 2. Time frames of the current study.

2.2. Collaborative Spaces of Almaty—Historical Retrospective

Historically, the city was compact and small, with 35-metre-wide streets and each quarter around 1.5−2 hectares. Travellers always noted that the city was in a comfortable location; they highlighted how green it was, cooled by aryk ("aryk"—from Kazakh "channels") along the streets [25]. The current study focuses on the period from the city becoming the capital of the Kazakh Soviet Republic in 1929. After Kazakhstan achieved its independence in 1991, Almaty remained the capital until 1997. It continued to grow after a brief period of stable growth at the beginning of the 2000s. Since then, the city has

been evolving rapidly, exhibiting the characteristics of a newborn country. Nowadays, Almaty is the largest city with significant economic and social potential. Figure 3 shows the demographic trends in Almaty, the former capital of Kazakhstan. At the same time, the city has grown by more than 100% since 2002, from 33,898 to 70,348 hectares [26]. According to the new General Plan (master plan) for Almaty, the population is expected to grow gradually from 1.916 million in 2020 to 3 million by 2041, which may underestimate the current trend [27].

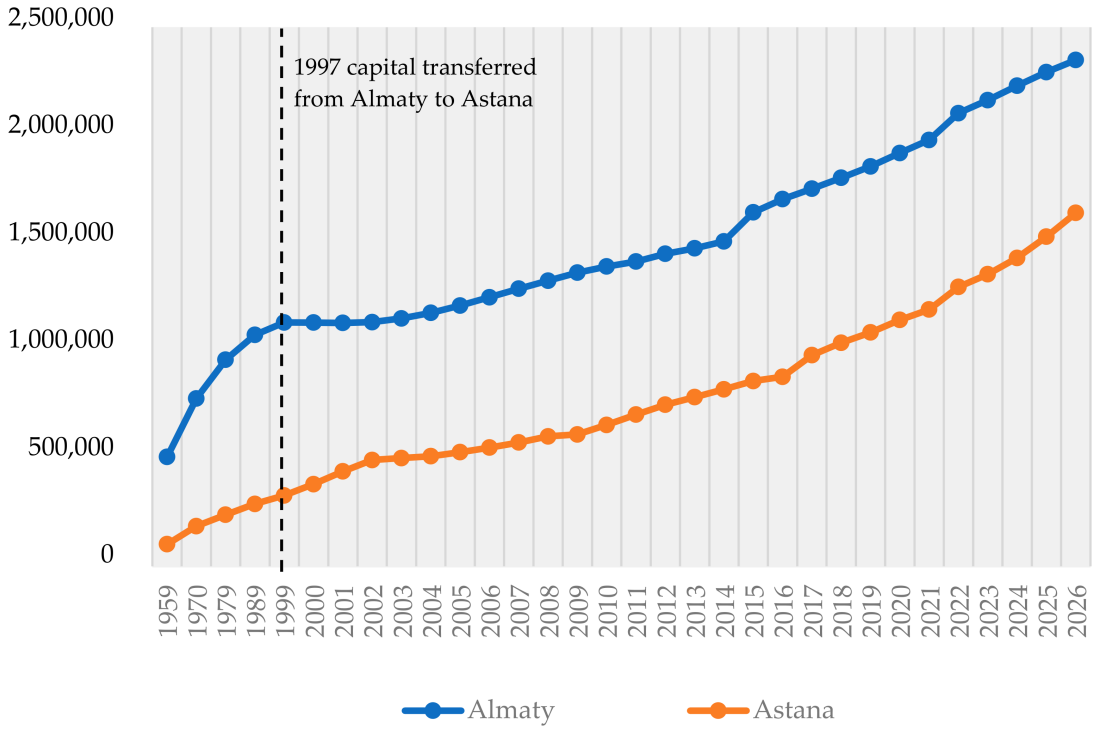

Figure 3. Population of Kazakhstan's big cities.

The current research included an analysis of all public spaces in Almaty. According to some studies, the classification of public spaces includes several main groups: socio-event spaces—for example, public squares; cultural and leisure spaces—theatres, cinemas, and adjacent open spaces (which may also be utilised); green recreational spaces—parks and public gardens; political spaces; everyday spaces [28]. All public spaces may have the potential to become collaborative spaces. As was mentioned earlier, collaborative spaces were identified as physical spaces that facilitate, encourage, and sustain formal and informal interactions, providing infrastructure for work, creativity, and social gatherings.

The current study included such spaces as city squares, canteens, religious temples, bazars, educational spaces, libraries, cinemas, museums, theatres, saunas, higher education institutions, shops and markets, military oriented spaces, hotels, residential blocks, circuses, bus stations, public halls, sport complexes, city airports, political buildings, highstreets, amusements parks, walking trails, visit centres, cafés, coworking spaces, creative hubs, social roofs, and mini parks. The data was accumulated from various sources. Main sources included archival historical city maps and city planning records, architectural guides [29], and works on Almaty's urban development [30–33]. Digital archives such as Archcode.kz and Vernoye-Almaty.kz provided additional documentation. Evolutions of all public and collaborative spaces are presented in Figure 4. The figure illustrates the mapping of public place typologies that emerged during the century under review, with 10-year increments. Additionally, the levels of comfort and human needs in Table 1 were used to examine the relationships between comfort levels and specific typologies over time. The illustration

helps to draw attention to the historical development of typologies in Almaty over the last hundred years.

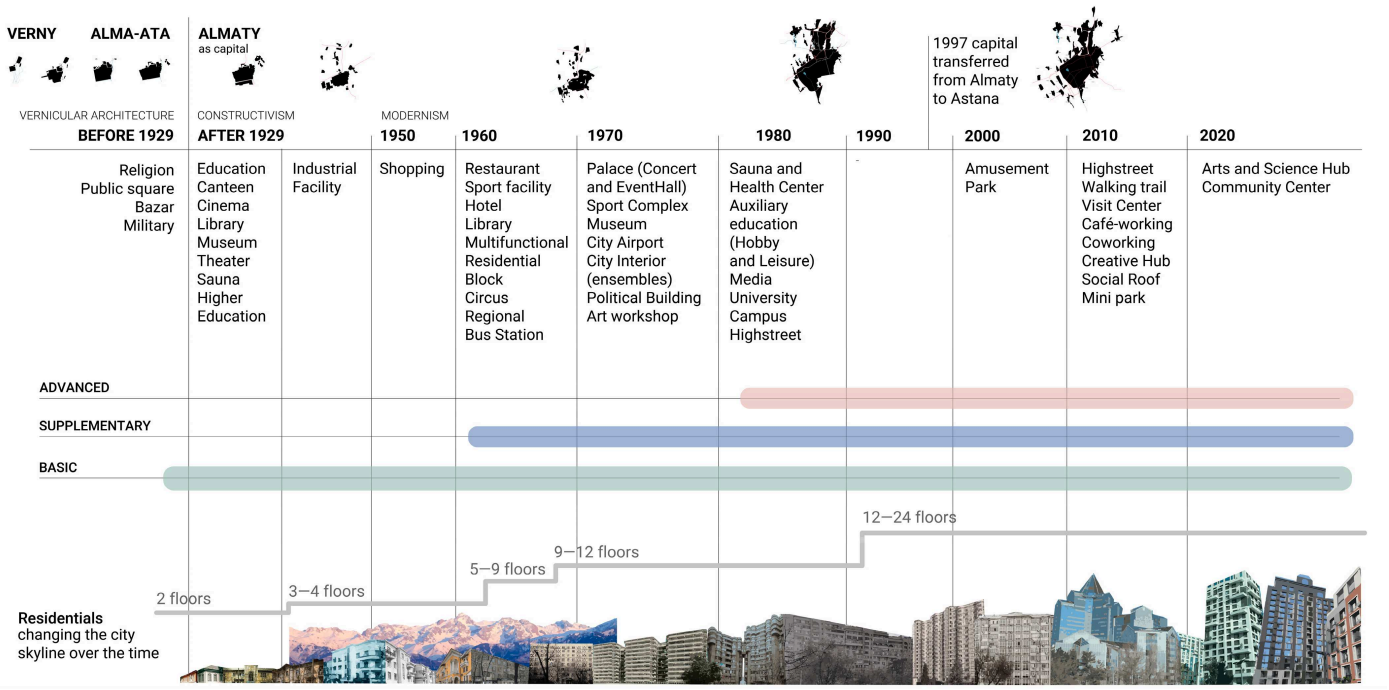

Figure 4. Public and collaborative spaces in historical retrospective. Illustration of the periods when each typology of public spaces and collaborative spaces occurred in Almaty, in relation to the evolution of residential buildings.

On the other hand, the image illustrates the parallel evolution of residential buildings and their heights. The gradual increase in the number of floors in residential buildings is directly influenced by the development of construction technology in the region to withstand seismic activity. Higher buildings increase density in developing districts, while the city centre has relatively low-rise buildings and fewer overall, so overall density is not changing much. At the same time, the city's outskirts are considered densely populated, with fewer public and collaborative spaces.

2.3. Collaborative Spaces Classification Through the Almaty Context

Before proceeding to the next phase of the analysis, it was necessary to classify and identify the collaborative spaces. Since the theoretical framework is rooted in the concept of well-being, not all elements of social infrastructure can be considered to fulfil the research objectives. Moreover, the present social environment of Almaty comprises a variety of educational, recreational, cultural, and commercial facilities that have emerged at different stages of the city's development. Therefore, to distinguish collaborative spaces from broader categories of public spaces, a systematic selection process should be conducted. In particular, attention was given to spaces that go beyond the fulfilment of basic physical and functional needs. At this stage, it is suggested that collaborative spaces should contribute to well-being and higher-order social and developmental needs.

Table 1 describes comfort levels and how the necessities of space are changing as spaces and comfort levels evolve. Advanced levels of comfort include aspects of spaces such as "Need for self-education and personal development", indicating that spaces should support self-education and personal development [30] (The table is adapted from Ref. [30], 2009, Akhmedova A.). On the other hand, these aspects can be fulfilled within the city's urban environment, across districts, and in public spaces. Big cities offer a variety of spaces

that enable residents to communicate, maintain connections, and collaborate. Third Places, coworking spaces, libraries, and many other public spaces encourage residents to utilise them to work together.

Table 1. Levels of comfort and human needs [30].

Levels of Comfort and Human Needs	Interpretation
Advanced	Need for self-education and personal development Aestheticisation of the space
Supplementary	Need for communication and privacy Articulation of living and auxiliary spaces Architectural and planning methods for improving the microclimate Zoning of space, creation of main functional areas
Basic	Creation of conditions for meeting basic physiological needs Protection from aggressive external environmental influences

Based on the current theoretical framework, the classification of public and collaborative spaces is shown in Figure 5. All typologies illustrated in Figure 4 were classified into three levels of human needs: basic—basic physiological needs, supplementary—need for communication and privacy, and advanced—need for self-education and personal development. It should be noted that all typologies cannot be assigned to a single level of comfort and human needs. Modern public spaces are often designed to be multifunctional, satisfying several human needs. Although each typology has a primary purpose, its use sometimes extends beyond its core functions by incorporating additional facilities. For example, the sauna and health centre typology is primarily associated with basic health needs; some may also include facilities such as cafes and spaces for informal gatherings. Similarly, restaurants and cafes are primarily designed to meet dining needs; they also serve as important social spaces that facilitate communication. Libraries, in contrast, are predominantly associated with self-education and self-development, but increasingly serve as venues for seminars, lectures, networking events, and community engagement activities, exhibiting adaptive characteristics. Collaborative spaces should have flexible typological boundaries and be adaptable to varying comfort levels and human needs.

To clarify the term "collaborative space", an appropriate literature review was conducted to identify typologies that may be classified as collaborative spaces (marked in green in Figure 5). The term is ambiguous and used in various contexts, including economics, architecture, innovation studies, and entrepreneurship [34]. The related term "collaborative process" further adds to the concept's complexity and usefulness across many areas. In Computer Science, a "collaborative space" is a physical or virtual environment within libraries or other institutions where users, librarians, and technology can interact to work on projects, conduct research, or engage in discussions. With the development of information and communication technologies, more and more researchers have questioned how these developments can change the way people collaborate and work [35,36]. Although these advancements may be crucial for space design, the present study focuses solely on physical environments and their typologies, omitting digital environments as collaborative spaces. In recent years, COVID-19 has changed our perception of work and communication, only adding to what researchers were exploring in the 1990s and 2000s.

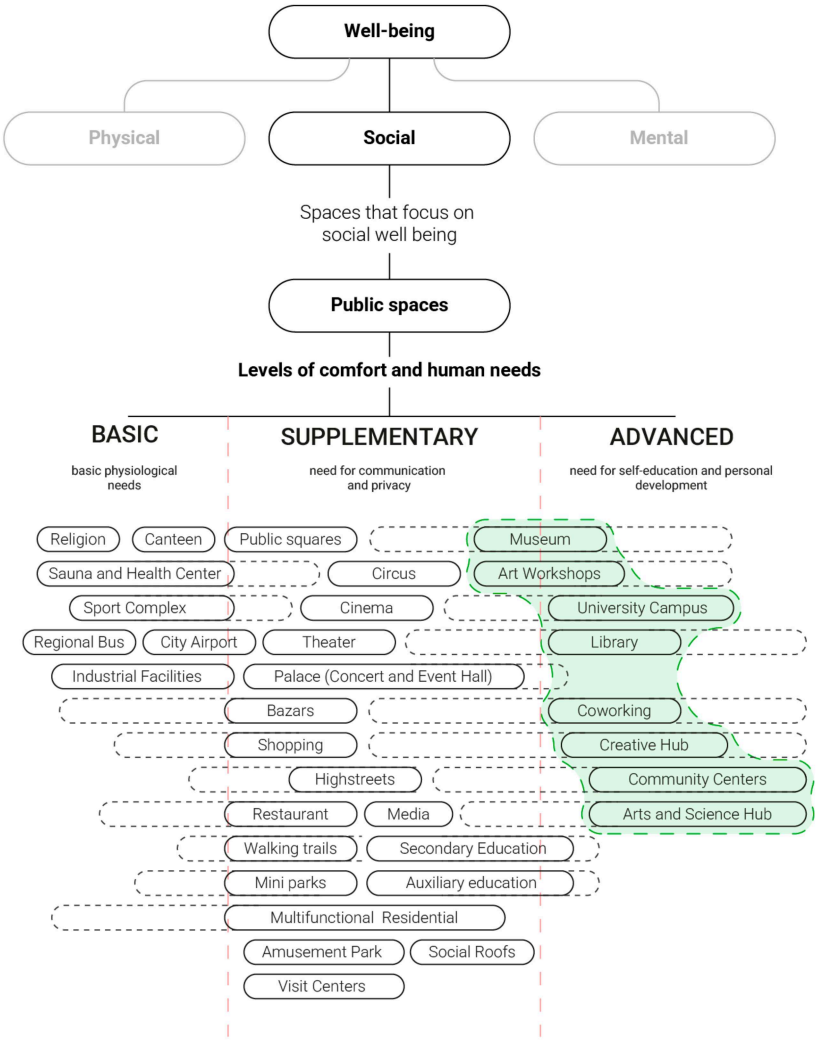

Figure 5. Classification of public spaces and defining collaborative spaces.

De Vaujany [37] defined collaborative space in general as a space in which "facilities, aesthetics, codes, temporalities, enacted values, atmospheres, and spatial configurations are aimed at fostering horizontal collaborations". Although the study was published in 2018, the researchers did not consider coworking spaces and conventional workplaces as collaborative spaces. It is worth noting that such "horizontal collaborations" can occur in many other contexts, such as museums, universities, and coworking spaces, which provide infrastructure for people to work as teams. These spaces tend to have various configurations and a variety of rooms for storage, work, relaxation, etc. Hua [38] stated that collaborative space, as a concept, encompasses both physical spaces that connect individuals and formal and informal collaboration practices. Thoring [39] took a different approach, using so-called creative spaces and their qualities to classify spatial typologies. In the current study, collaborative space is a type of space within the creative space that also provides social infrastructure for people to work and socialise simultaneously, fulfilling needs that fall into the "advanced category" (Table 1).

Museums and art workshops have always served as a platform for cultural exchange, mobilising artworks and creating spaces that collect knowledge across different levels of heritage. Furthermore, cultural heritage provides additional economic opportunities, encouraging employment and improving economic growth [40]. For example, in 1997, James Clifford described the process of curating the museums' collections of art from the United States and Canada as "more than a place of consolation or research: it became a

contact zone" [41]. Moreover, the Bilbao Effect is a prime example of regeneration and economic strategy, with the Guggenheim Museum Bilbao serving as the main driver of local economic growth and a major draw for locals and tourists [42].

Community centres, on the other hand, play a vital role in empowering the local community of activists, providing spaces, sometimes free of charge. According to the Community Spaces Network's 2024 report, community organisations receive many benefits. Among those improvements, there is the ability to achieve goals (90% in 2024), increase in staff morale (84% in 2024), improved staff recruitment (55% in 2024), provide staff retention (49% in 2024), develop programmes' size/scope (63% in 2024), provide stability of costs (79% in 2024), obtain stronger revenues (50% in 2024), and increased quality of services (76% in 2024) [43].

Universities and R&D institutions can be considered collaborative spaces because they provide opportunities for students to work on various projects in a single environment, and for professors and researchers to collaborate on multiple research projects. In addition, these institutions increasingly adopt frameworks that facilitate the exchange of complex knowledge and skills, effectively evolving into hubs for entrepreneurial and social activities [44].

Further, this list of typologies specialised for collaboration can be expanded to include coworking places, FabLabs, Living Labs, makerspaces, and hackerspaces. In general, such collaborative spaces become centres of collective innovation because of the diverse community of people with various backgrounds [45].

There is only one Arts and Science Hub in Almaty dedicated to children, which will open soon [46]. Although the facility has great potential to become a collaborative space within Almaty's urban landscape, it was omitted from further phases of the study for two reasons: the current study focuses on collaborative spaces for adults and young professionals, who are the main actors in the city's daily life. The hub has not yet opened, so its influence on the surrounding environment cannot be evaluated.

2.4. Spatial Mapping and Analysis of Almaty

The second phase utilises spatial analysis and geographic visualisation to map the current distribution of collaborative spaces across Almaty and identify patterns of deficit and concentration [47].

The list of collaborative spaces examined in this phase, which includes coworking spaces, universities and R&D institutions, libraries, museums, and community centres, was derived from the selection process described in the previous section. These typologies represent the greatest potential for collaboration within the urban environment (Figure 6). This list is not final and may include additional typologies, but in the current study, it is considered adequate for evaluating the methodology. These spaces are physical areas that facilitate, encourage, and sustain formal and informal interactions, providing infrastructure for work, creativity, and social gatherings. Although there is a certain typology of places for building and sustaining social connections in architecture, such as cafes, restaurants, and parks, these places tend to be more functional only for dining, leisure and entertainment. While shopping malls are strong examples of social infrastructure, they are less likely to be chosen for work or collaboration. By contrast, business centres with the largest concentration of firms lack social infrastructure.

The main strategy is to connect the concepts of well-being and the Third Space to the architectural environment and specific typologies of collaborative spaces around Almaty. Furthermore, the study emphasises the connection between outdoor public spaces and indoor collaborative spaces.

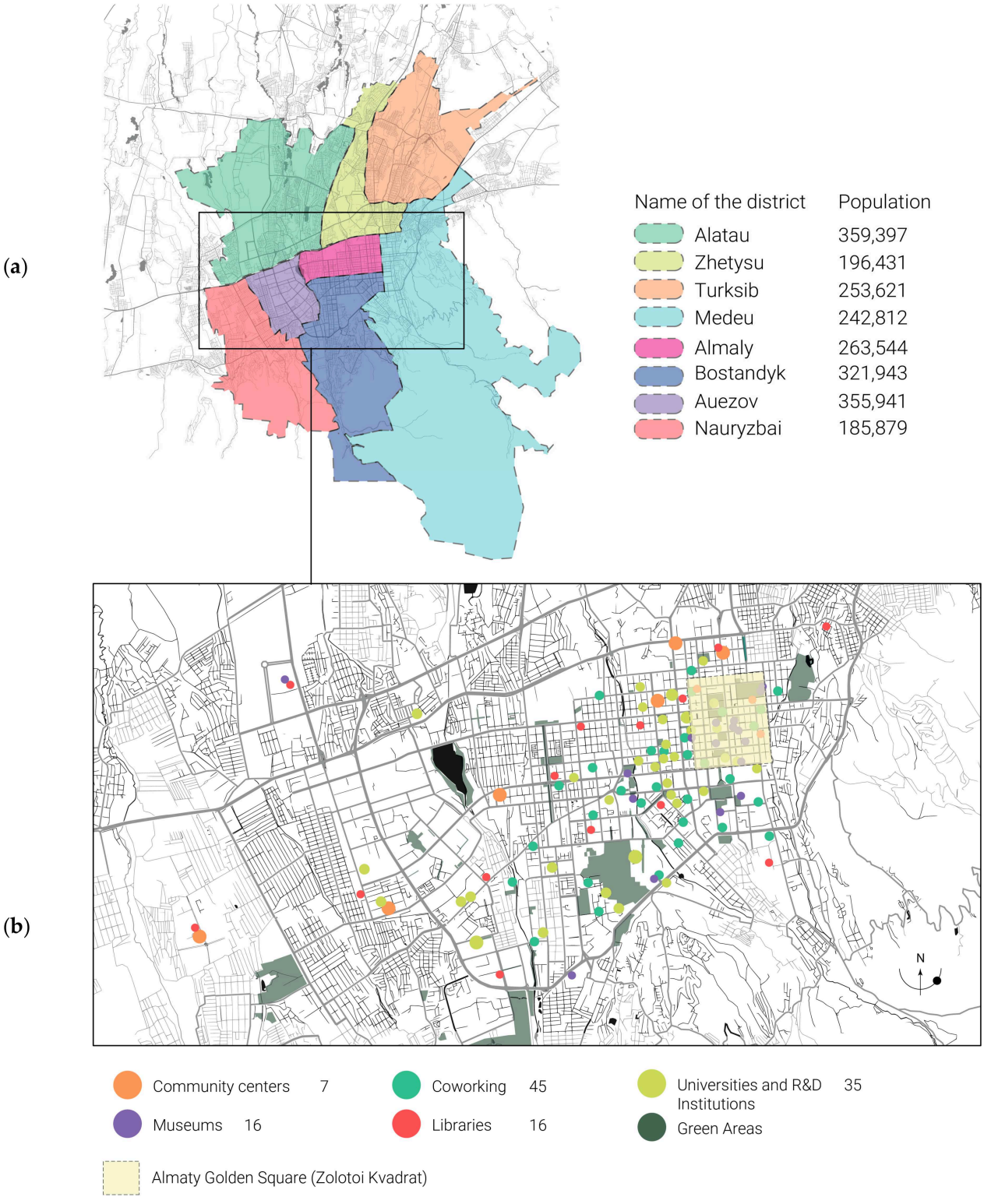

Figure 6. Mapping the collaborative spaces. (**a**) The Almaty map shows districts' administrative boundaries and their populations. (**b**) Spatial mapping of collaborative spaces around Almaty.

The data used for the current study includes a map of Almaty and schemes that combine spatial data into a visual collage. The data for the current study were obtained from open sources and platforms, including 2GIS (https://2gis.kz/almaty (accessed on 15 September 2025)), Google Maps (https://www.google.com/maps/ (accessed on 15 September 2025)), Yandex Maps (https://yandex.com/maps/ (accessed on 15 September 2025)), and the GIS map of Almaty (https://alag.kz/ (accessed on 15 Septem-

ber 2025)) during 2025 (Table 2). Placement accuracy was ensured through verification from the mentioned online sources. The mapped locations, therefore, represent physical locations in the city and do not meet cadastral precision. The spatial location of mapped collaborative spaces reflects the approximate block-level placement, based on the nearest street intersections rather than precise geographic coordinates.

Table 2. Data organisation and sources.

#	Type of Data	Source Name	Source Link	Access Date
1	Administrative boundaries	GIS map of Almaty	https://alag.kz/	15 September 2025
2	University and R&D institutions locations	Egov.kz	https://egov.kz/cms/ru/articles/2Fvusi_rk	15 September 2025
		2GIS	https://2gis.kz/almaty	15 September 2025
3	Coworking	2GIS	https://2gis.kz/almaty	15 September 2025
4	Community centres	2GIS	https://2gis.kz/almaty	15 September 2025
5	Museums, galleries and art workshops	2GIS	https://2gis.kz/almaty	15 September 2025
6	Public libraries	2GIS	https://2gis.kz/almaty	15 September 2025

Most of the data extracted from open sources was geolocated and visualised in Adobe Illustrator (v2025) for refinement and integration into further research. This combination of quantitative spatial analysis and qualitative visual documentation follows the integrated approach to the study of public life advocated by Gehl and Svarre [48], who emphasise the importance of understanding both patterns and experiences.

Furthermore, all mapped collaborative spaces were grouped into clusters to evaluate the walking-distance accessibility of each cluster (Figure 7). The clusters connected nearby institutions within a 15–20 min walk (up to 1.5 km), so dots placed farther than that became disconnected. This follows the logic that each cluster of collaborative spaces creates a field (coloured accordingly) of alternatives for nearby residents to choose from among coworking spaces, universities and R&D institutions, libraries, museums, or community centres.

Cluster analysis identified areas of high concentration (primarily the historic centre) and areas of deficit (newly developing peripheral districts). The mapped data exhibited clusters of various typologies around several districts in Almaty. Mostly, they were situated around the so-called Golden Square region in the city, along Zheltoksan, Kabanbai Batyr, and Kunayev streets, up to Abai Avenue (Figure 7). Since the 1920s, Golden Square has been gradually evolving, combining high-end real estate and housing for Almaty's incoming population [49]. Even today, the area has high real estate prices and is considered a place to live near the city centre.

To understand changes in the number of collaborative spaces in Almaty, data were collected from the Bureau of National Statistics. They were calculated and visualised as part of Phase 3 of the current methodology. The dataset was retrieved from the Bureau of National Statistics' web depository and included annual counts of libraries, universities, and R&D institutions, parks, and museums, which changed over time between 2006 and 2025 (Figure 8).

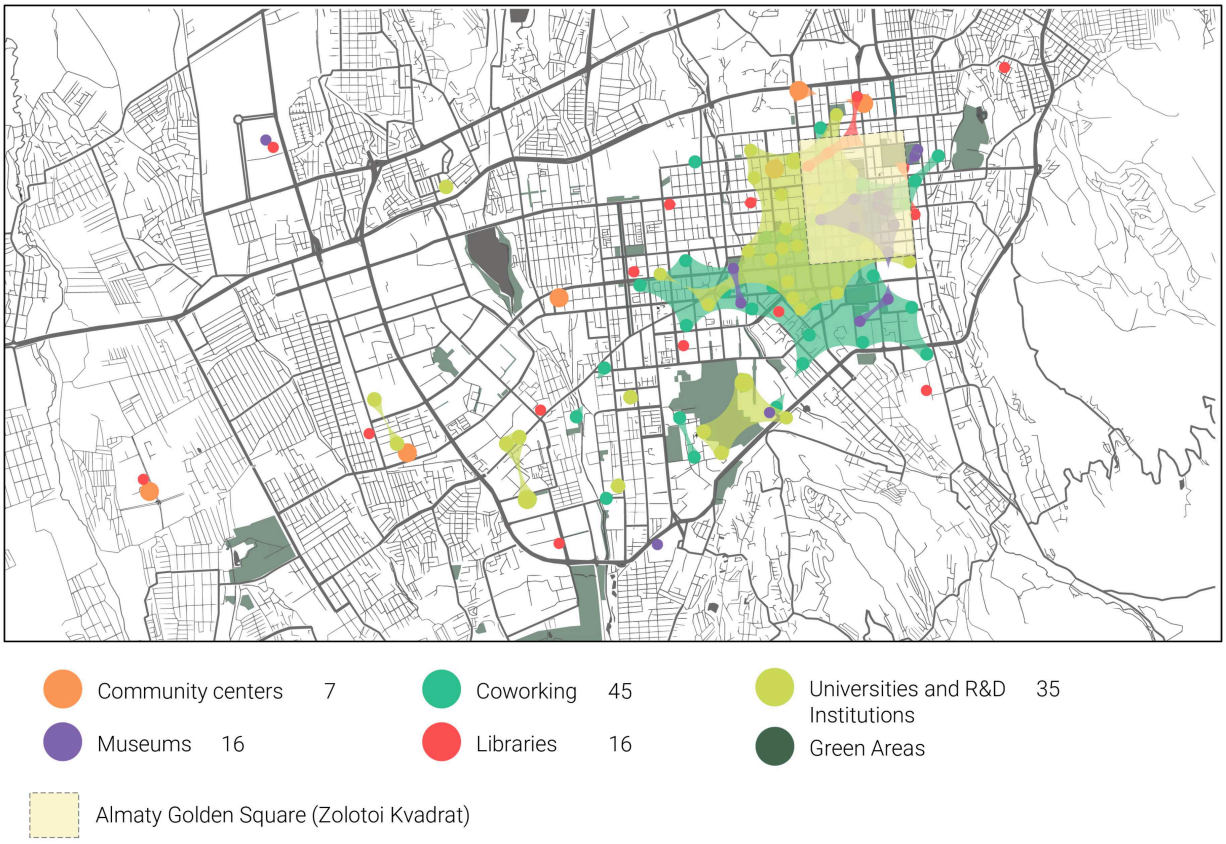

Figure 7. Cluster analysis. Identifying clusters of collaborative spaces. The numbers in front of the typologies indicate the number of typologies provided in open sources.

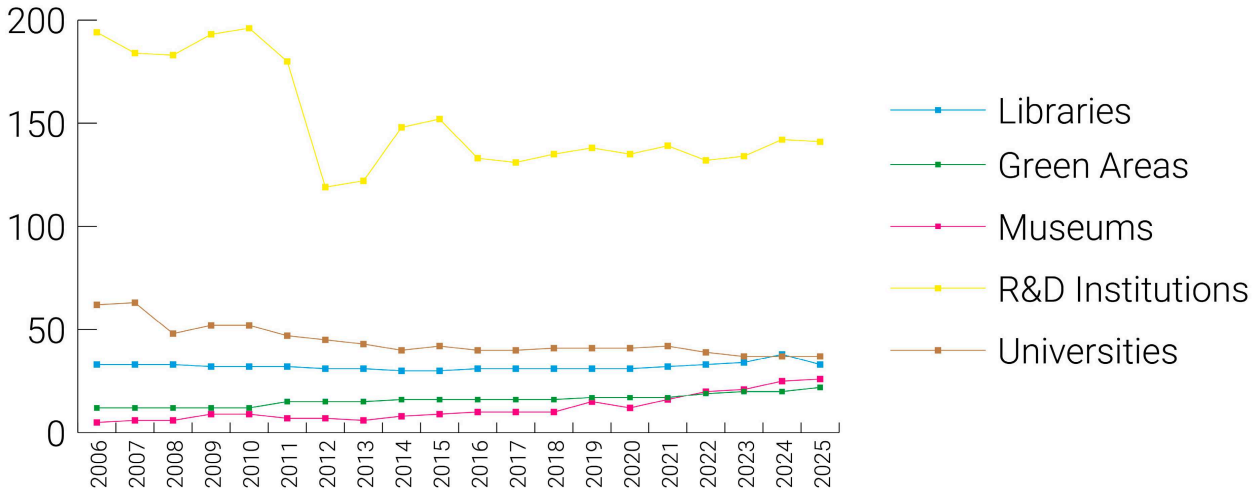

Figure 8. Longitudinal overview of collaborative spaces in Almaty from 2006 to 2025.

It is important to note that official statistical categories provided by the Bureau of National Statistics may not be conceptually identical to the definition of collaborative spaces presented in the study. Now, "collaborative spaces" is not used as a term to describe a separate typology. On the other hand, the statistical categories presented serve as indicators of socially interactive urban environments. The selection of libraries, universities and R&D institutions, green areas, and museums was based on their shared spatial and functional characteristics, including collective use, knowledge exchange, and, most importantly, opportunities for social interaction and engagement within the urban fabric. Although coworking spaces and community centres are a great example of collaborative spaces, the

Bureau of National Statistics does not provide a separate longitudinal statistical dataset for this typology. This limitation is partially explained by the recent emergence of the coworking, creative hub and community centre typologies in Almaty, particularly since 2010 and the 2020s, respectively (Figure 4). On the other hand, the separate dataset for R&D institutions is presented by the Bureau of National Statistics, so it was separated from the typologies presented in the spatial mapping of Figures 6 and 7. Furthermore, the Arts and Science Hub typology was excluded as an outlier, being the only one in the city and not yet constructed. Finally, the authors acknowledge that the presented categories are mostly administrative and can be interpreted as an approximation to broader collaborative space dynamics within local urban environments.

To analyse the trajectory of each category of collaborative spaces over 19 years, annual counts were converted to percentages relative to the base year, 2006. This approach is a standard statistical technique for measuring change over time, as it clearly illustrates the relative growth or decline from a common reference point [50].

Figure 8 below shows a longitudinal overview of collaborative spaces in Almaty from 2006 to 2025. The numbers were retrieved from the Bureau of National Statistics, revealing various trajectories in the socio-economic urban environment.

The year 2006 was selected as the baseline (or reference point) against which all subsequent changes were measured. This follows the methodological principle of baseline normalisation, in which an initial state is established to enable consistent evaluation of all future deviations. This concept is widely applied in fields such as environmental geology and urban studies to assess changes in complex systems over time. The transformation was performed using the following calculation for each category of space for each year t from 2006 to 2024:

$$Index\ Value_t = \left(\frac{Number\ of\ Spaces\ in\ Year_t}{Number\ of\ Spaces\ in\ 2006}\right) \times 100 \quad (1)$$

In this formulation, the base-year value (2006) is set to 100. A resulting index value greater than 100 for a subsequent year indicates a net increase in the number of that type of space relative to 2006, while a value below 100 indicates a net decrease. This method is particularly effective for presenting a clear and intuitive visualisation of the "exposure" or changes in the amount of these spaces, allowing for direct comparison of trends across categories that may have had vastly different absolute numbers in the base year. The final visualisation is presented in Figure 9.

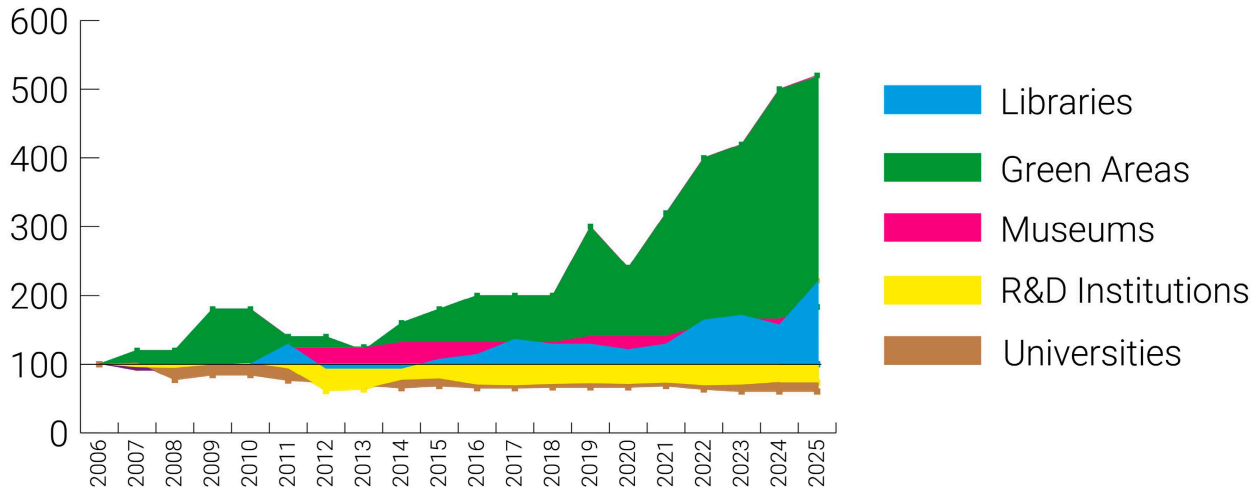

Figure 9. Relative change in collaborative spaces and urban infrastructure (2006–2025).

This statistical analysis illustrates the distribution and temporal evolution of five types of collaborative spaces in Almaty—libraries, green areas, museums, universities and R&D institutions—through the period from 2006 to 2025. The most substantial growth is seen in green areas, which are almost five times as many in 2024 as in 2006. This may be justified by changes implemented in 2012, including alterations to districts' boundaries by the city's mayorship (Akimat of the City of Almaty and Maslikhat of the City of Almaty, 2013. Ob ustanovlenii granits rayonov goroda Almaty [On establishing the boundaries of the districts of the city of Almaty]. Joint Resolution No. 4/1035 and Decision No. 80. Department of Justice of the City of Almaty (Published 2012)) [51]. This was followed by changes from the Mayorship of the City of Almaty and the Maslikhat of the City of Almaty; the districts' boundaries were updated in 2014 (Akimat of the City of Almaty and Maslikhat of the City of Almaty. (2014). Ob obrazovanii Nauryzbayskogo rayona i ustanovlenii granits rayonov goroda Almaty [On the formation of the Nauryzbai district and the establishment of the boundaries of the districts of the city of Almaty]. Joint Resolution No. 3/522 and Decision No. 240. Department of Justice of the City of Almaty) [52]. These changes involved the inclusion of vast territories within the national park into the boundary of the Medeu District. Hence, since 2016, the number of Green Areas has increased drastically. Regardless of the reasons behind the increase in green spaces in Almaty, this change presents unrecognised potential to create more collaborative spaces.

On the other hand, we can see a negative trend in the distribution of universities and R&D institutions from 2006 to 2025. Since the 2000s, the number has been declining due to rising trends in privatisation and redevelopment of the territories for residential use [53].

Further, all territories were visualised through several layers of historical maps of Almaty (Figure 10) as part of Phase 4 of the current methodology. Three main layers were selected to show greater progress in the urban development of Almaty: 1937, as the earliest depiction of the city; the 1940s, the period of urbanisation during the mid-20th century; and 1989, when the city acquired territory near the present overview.

Figure 11 was created to illustrate the difference between the urban environment in Almaty in the early 20th century and the current status quo. Figure 11a portrays Almaty in the early 20th century, the period when it became the capital—a small town with wide streets and many green areas, surrounded by a mountainous landscape. The urban skyline is not competing with the mountain skyline, and the streets have ample space between them (marked in orange). The space and non-space are well balanced and offer many opportunities for shops, cafes, stables, carriage movement, and public spaces for people, creating more opportunities for collaborative spaces. On the contrary, Figure 11b portrays Almay as it is today, when buildings occupy more space. The distribution between space and non-space is imbalanced. Although Figure 11b exhibits a variety of buildings of different heights pointing to the construction from different timelines, the space is saturated with space in between (coloured as orange), providing even fewer opportunities for the creation of public and collaborative space. The majority of open spaces are taken up by car parks that distort the urban fabric, making it less liveable and comfortable.

This study has several limitations that should be acknowledged. First, the mapping analysis is necessarily constrained by the availability and accuracy of open-source data; some collaborative spaces (e.g., informal creative hubs, temporary uses) may not be captured. Furthermore, the study design did not appear to directly assess the well-being of space. Rather, it tests the architectural and urban environment that may promote and enhance social well-being through collaborative spaces.

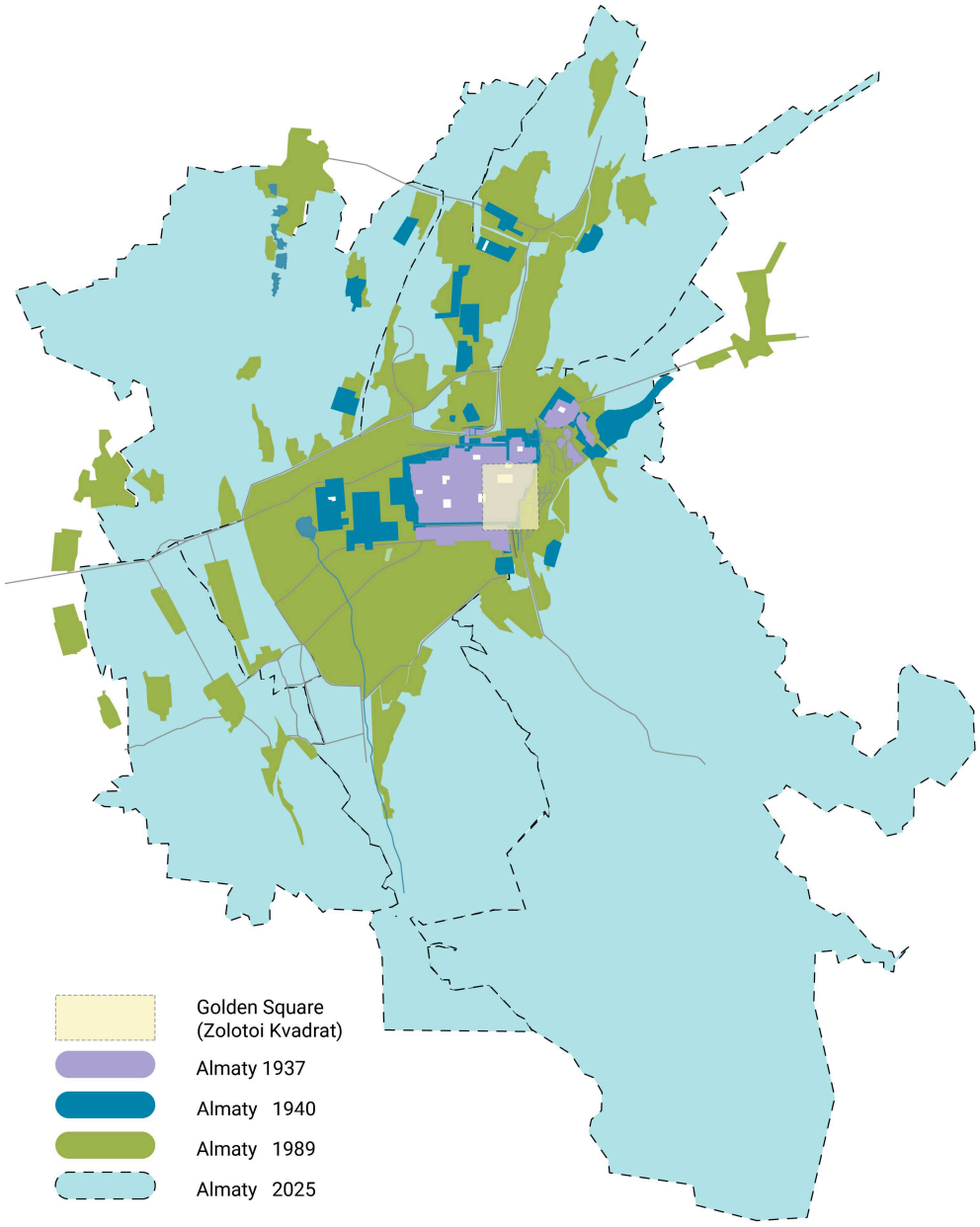

Figure 10. Time-scheme of districts development of Almaty.

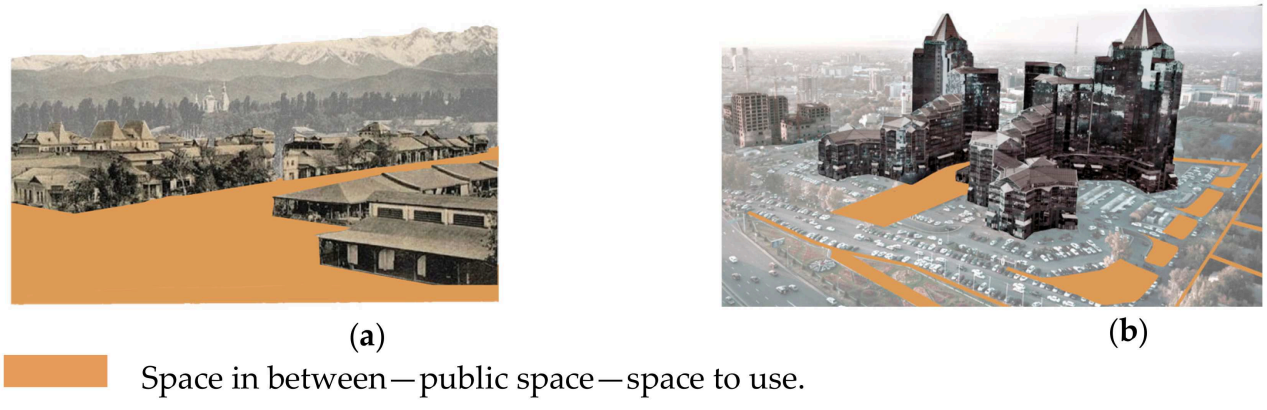

Figure 11. Spatial image comparison. (**a**) Urban spatial image—Almaty 1920s, (**b**) Urban spatial image Almaty—nowadays.

3. Results

The current study investigated the evolution, distribution, and spatial characteristics of collaborative spaces in Almaty's urban environment in relation to urban well-being. Through rigorous study, historical analysis, spatial mapping, longitudinal statistical analysis, and historical graphic analysis, the current research explored several objectives: defining collaborative spaces in an architectural context, exploring the influence of collaborative spaces on well-being, and providing recommendations for further study and for architectural and urban design.

The historical analysis presented in Section 2.2 shows that the urban fabric of Almaty was well developed and provided a variety of collaborative spaces during Soviet times. The Soviet era created complexes of buildings with dedicated social infrastructure within a political and manufacturing context, including cultural palaces, restaurants, and public halls. In 2017, coworking spaces emerged as collaborative spaces in the modern context. Although the city's social infrastructure was expanding during the second half of the twentieth century, there is a critical discontinuity in centralised city planning for social infrastructure after the Soviet period in the 1990s. Urban spaces were systematically organised through ensembleness and micro-district planning strategies, providing residential spaces, childcare institutions, cultural hubs and health and leisure spaces. On the other hand, the post-Soviet period exhibits an often chaotic integration of social infrastructure into new residential districts. Nonetheless, Almaty has expanded almost two-fold from the 1930s to the present; the historical core has remained spatially organised and continues to function as an important urban centre (Figure 10).

Architectural typologies often followed a political agenda during Soviet times. Nonetheless, the social infrastructure was widely provided through indoor collaborative spaces and outdoor green public areas. At the same time, differences in market development dictate the forms of architectural and urban development. While Soviet republics operated under a planned economy for decades, the market economy in the 1990s challenged the government and developers to reconsider their development strategies. Yet, it was only partially able to address the needs of modern social infrastructure.

The longitudinal analysis of collaborative spaces from 2006 to 2025 (Figure 3) shows markedly different developmental trajectories. Although the number of parks is reported to have increased several times, this is due to the expansion of the administrative boundaries of the Medeu district, which now includes the national park. It is critically important that the number of essential collaborative spaces, such as universities and cultural spaces, decreases over the study period. This decline corresponds with the privatisation process and the redevelopment of the building and territories. It is suggested that the government and developers should take these trends into account as they work toward a sustainable future and promote social well-being for city residents.

Indoor and outdoor integration: Although researchers, designers, and architects explore the potential of well-designed workplaces and office spaces, there is a lack of research examining the connection between collaborative spaces and public places. While people spend the majority of their time indoors, there is a clear need to explore the connection between the outdoors and the indoors to create a smooth transition that enhances well-being.

Green spaces could provide substantial social infrastructure and connections to nature, promoting overall well-being, especially in Almaty, following the reorganisation of administrative districts and the expansion of green areas. Still, they should be integrated with an indoor collaborative space and mixed uses at the ground level. Considering indoor and outdoor spaces as two parts of the built environment, indoor spaces provide a close environment that satisfies people's needs with mixed or specific functions. In contrast, outdoor spaces serve as a connection between these functions.

Definition of collaborative space: The current study proposes defining collaborative spaces as adaptive public spaces that facilitate formal and informal social connections. They enable the exchange of knowledge and experience, support interdisciplinary interactions that generate innovation and creative ideas, and foster the development of intellectual capital among specialists across various fields. Collaborative spaces serve as a significant social platform for self-realisation, collaboration, and the fulfilment of advanced levels of human needs within the context of individualisation of modern society. Collaborative spaces nowadays may have particular significance, providing the best environments for socialisation, collaborative creative activities, and knowledge exchange, all of which may increase well-being, quality of life, and social capital. This definition emphasises physical and spatial architectural dimensions and the critical relationship between indoor and outdoor spaces.

Influence on well-being: The research suggests that collaborative spaces may contribute to urban well-being through multiple mechanisms. They provide an occupational balance between work and social life, connecting both in a single indoor–outdoor space [17,18]. They provide additional social infrastructure, creating more opportunities for formal and informal connectedness and hence facilitating social and mental health [15,16]. Collaborative spaces create more prospects to prevent social isolation, which often occurs in big cities [12].

Furthermore, the study contributes to the theoretical understanding of Oldenburg's concept of Third Places, which has previously been applied mostly to commercial spaces such as cafes, restaurants, and bookshops. It is suggested that Third Places can be considered more broadly, including settings such as universities, community centres, coworking centres, museums, and theatres. These spaces serve as platforms for sustaining social connections. Moreover, as mentioned earlier, Third Places should form an ecosystem of spaces connected through the outdoor public realm and recreational spaces within the urban fabric.

Building on the works of Hua [38], Thoring [39], and Capdevila [45], this study also proposes a new typological framework for collaborative spaces, rooted primarily in adaptability rather than function alone.

Finally, this research shows that new typologies are not mutually exclusive but coexist and intermingle, creating new forms. For example, contemporary libraries are not just reading rooms but also a mix of coworking spaces, literature databases, and sometimes venues for public talks and lectures. Libraries are becoming modern, adaptive spaces where residents can study, work and socialise. Tselinny Centre of Contemporary Culture in Almaty, opened in 2025, is a great example of a new type of museum that combines a research centre, an event space, a shopping area and an architectural monument dedicated to exploring the story of its redesign and reconstruction. The former Soviet-era cinema centre, now redeveloped, goes beyond the simple typology of an art gallery or museum and offers educational programmes, its own publishing, research, and art projects (https://www.tselinny.org/ru/depth/scholar-in-residence (accessed on 10 April 2026)). SmArt.Point positions itself as the first coworking space in Almaty, emerging in the 2020s. The space combines a variety of functions under one roof. Although created as a coworking space, it now serves as an educational platform, an event venue, and a business networking hub. SmArt.Point goes beyond a conventional coworking space, serving as a platform for knowledge exchange, community building, and entrepreneurship (https://smartpoint.me/ (accessed on 10 April 2026)). DOM36 emerged on the Almaty urban scene in 2020, located in the building of the former Uzbekistan ambassy. It represents one of the first creative hubs in Almaty, hosting many cultural and educational events and exhibitions. The historically significant building served as a great hub for creative companies and a community of peo-

ple from a variety of fields, all in one place. Similar to the Tselinny Centre of Contemporary Culture, the Almaty Museum of Arts, established in 2025, represents a contemporary example of a museum that extends beyond the conventional functions of exhibiting artefacts. The museum operates as an educational, scientific, and cultural hub that attracts locals and tourists daily (https://www.almaty.art/ (accessed on 10 April 2026)). Most successful urban environments feature a mixture of functions and typologies within a building, with a well-integrated outdoor space that creates seamless collaborative spaces.

4. Discussion

The present study proposes recommendations for policymakers, architects, and urban planners to enhance existing collaborative spaces and create new ones throughout the city, thereby increasing residents' well-being.

- "Collaborative space" as a term: Standards of urban development may include the term "collaborative space" or "collaborative infrastructure", falling into the category of public spaces. New standards should include a qualitative requirement of the presence of collaborative spaces around the residential blocks. Such spaces include mixed-use and adaptive-use spaces. Furthermore, collaborative spaces should not be limited to indoor settings but should be integrated with outdoor green and recreational spaces to enhance well-being.
- Design for adaptability: Collaborative spaces should accommodate room for future evolution. Engineering systems and special building configurations should support multiple use scenarios, from individual use to group community meetings.
- Prioritise integration of indoor and outdoor spaces: The most successful collaborative spaces and environments exhibit a clear connection between the interiors and the exterior. Indoor spaces should have clear access to terraces, gardens, parks, alleys, and streets from the first level.
- Learning from historical precedents: The Soviet-era approach to urban development "ensembles" remains highly relevant today and should be considered and adopted by developers, urban planners, and architects. Such a design approach integrates both outdoor and indoor spaces into a single urban system that, together, creates a well-designed environment in cities. On the other hand, the old centre of Almaty, despite its rigid urban structure, adapts very well to new trends and urban development.

While Akhmedova [30] considers the levels of comfort and the human needs framework to address the comfort levels of residential buildings, the current study attempts to utilise a similar framework for urban environments. This approach revealed adaptability as a characteristic of public spaces that may provide greater comfort and enhance well-being.

Future research should investigate the relationships between collaborative spaces and well-being using quantitative methods, including surveys, behavioural observations, and morphological analyses on a smaller scale. Comparative studies between other cities may significantly improve understanding of the contextual factors that influence the emergence and performance of collaborative spaces.

During the mapping analysis of collaborative spaces in the current study, some typologies were omitted because the study focused on collaborative spaces for adults and young specialists. A typology such as the Arts and Science Hub in Almaty, which is offered to children, warrants further research into its potential as a collaborative space for younger generations. This implies that collaborative spaces may require further investigation, though additional literature analysis may be needed. The study may take a direction of exploring normative principles of child-friendly communities for Third Places.

5. Conclusions

The current research examines how collaborative spaces in Almaty have evolved, spread, and undergone architectural change since Soviet times. It explores their contribution to urban well-being in today's fast-changing city environment. Using historical–typological analysis and spatial mapping, the study explains how these spaces developed and function, emphasising their indirect impact on well-being.

One key finding is that the distribution of collaborative spaces is much higher in the old part of the city, the Golden Square, and that there is a significant shortage on the outskirts. The patterns of social infrastructure emerging across the city indicate that the new residential districts lack space for social interaction. As a result, some parts of the city lack the proper social infrastructure necessary for people to collaborate, interact and sustain social connections.

The study also shows that collaborative spaces are hybrid spaces dedicated to work, social interaction, and creativity, and that they play a significant role in the city's urban environment. The impact of such spaces may contribute in various ways to daily life, enhancing social and mental well-being and providing an opportunity for occupational balance. In particular, the study emphasises the importance of connectivity between such places and the indoor and outdoor environments across the city. Finally, the authors suggest that the presence of collaborative spaces in the neighbourhoods may improve comfort and boost general well-being. Such clusters of indoor and outdoor connections within collaborative spaces in the urban environment can be a systematic improvement. Still, they raise more questions about the existence of this new typology.

At the same time, the study extends understanding of the collaborative space typology by considering museums, universities, libraries, and community centres as vital parts of urban and residential infrastructure. The study showed that collaborative spaces, as a typology within the architectural environment, are complex and warrant further research. The current study sought to define a concept characterised by a higher order of human needs (self-development and self-education), adaptability, and an essential role within the social infrastructure of the urban environment.

The results also suggest the need to develop Almaty into a polycentric city with a balanced distribution of collaborative spaces across residential districts. Planning strategies should prioritise the provision of multifunctional spaces, supported by green areas and open public spaces, within walking distance of residential buildings. This establishes a new paradigm for understanding comfort and well-being through the lens of the urban environment. In conclusion, collaborative spaces should be integrated into urban and living environments and recognised as a crucial element that indirectly influences quality of life.

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Data Availability Statement: The original data presented in the study are openly available in 2GIS (https://2gis.kz/almaty (accessed on 15 September 2025)), Google Maps (https://www.google.com/maps/ (accessed on 15 September 2025)), Yandex Maps (https://yandex.com/maps/ (accessed on 15 September 2025)), the GIS map of Almaty (https://alag.kz/), Egov.kz (https://egov.kz/cms/

ru/articles/2Fvusi_rk (accessed on 15 September 2025)) and the digital repository of the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan (https://stat.gov.kz).

Conflicts of Interest: The authors declare no conflict of interest.

Abbreviation

The following abbreviation is used in this manuscript:

R&D Research and development

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