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The Evolution of Business Center Buildings and Prospects for Their Adaptation in the Post-Pandemic Period in Kazakhstan

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Abstract: The buildings of business centers make up a significant part of the development of modern cities. Having different sizes, functional content and architectural and artistic solutions, these complexes are often spatial dominants. The compositional accent formed by them indicates the place of concentration for social activity associated not only with business activity but also often with an entertainment pastime program. The formation of a business center as a specific type of building has a long history from open or semiclosed spaces in ancient times, in which trade operations were carried out, to modern multifunctional, multistory buildings. These buildings are located singly or form complexes occupying one or more blocks. Business centers in Kazakhstan developed in a peculiar way, having a break in their development. The analysis carried out made it possible to identify a number of characteristic features of this development. The post-COVID-19 period has formed a new stage in the evolution of business centers. Demand for this type of building has partially declined. Existing buildings began to partially or completely reorient themselves to other activities. At this stage, the most promising option for multistory complexes is their transformation into hotels or residential buildings.

Keywords: architecture of the business activity space; business center; buildings of various stories; architectural and artistic solution; layout; renovation

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1. Introduction

Since the end of the past century, various buildings for private commercial activities have become an integral part of Kazakhstan's architecture, which is increasingly being included in the world architectural process, interestingly adapting the prevailing trends to regional cultural, historical, socioeconomic and climatic specifics. Numerous shopping, entertainment, wellness, production, warehouse, logistics, exhibition complexes and centers for the provision of financial, legal, intermediary, educational and consulting services are in both differentiated buildings and integrated buildings, forming a set that now consists of repurposed or reconstructed facilities built in the previous period, and a large number of new buildings. They are used not only by large corporations but also by small and medium-size businesses, which are, in fact, a mass consumer, providing a significant part of the demand for both the spaces themselves for functioning and for the entire range of services accompanying their activities. The multispeed and multidirectional dynamics of the development of entrepreneurial activity creates the need for an appropriately organized space adequate to this specificity of the activity. The formation of such spaces determines the need for constant study of the development of the phenomenon from the standpoint of reflecting the current needs of users of architectural interpretation. In addition, naturally, these spaces form an important component of the organization of business activity in

the Republic of Kazakhstan. The above together determine the relevance of the study conducted by the authors.

In studying the future development of business centers in relation to their architectural form and function, the following aspects are important. Business centers are in different parts of settlements and have different sizes, both by area and by number of floors. The buildings themselves are both new buildings originally designed for this function and repurposed or appropriately reconstructed objects for various purposes. They differ in the degree of specialization or versatility and in the ability to adapt to the needs of the tenant. The level and range of services provided to tenants varies. The ability of tenants to conduct various types of commercial activities in the field of organizing the sale of goods in a complex or a separate building typologically distinguishes a business center from structures for production purposes with their administrative and household units and buildings for state and municipal administration.

In many of the works analyzed by the authors, this typological feature turns out to be somewhat blurred, and buildings and complexes in which only offices and auxiliary premises are located are considered as business centers. From the standpoint of this study, such buildings are special cases of business centers. Also included in the category of business centers are the "headquarters" of firms occupying the entire building or complex, although the concept of "business center" in a certain sense implies the presence of several tenants and, indeed, the formation of a single-profile or multidisciplinary "business activity center". This typological phenomenon has gone through a number of evolutionary stages and has become an essential part of the modern urban environment. It is interesting that business centers of the late twentieth century, as a kind of architectural phenomenon, have already begun to be considered as part of a valuable architectural heritage [1]. The placement of office buildings in the structure of the city and a number of planning features of office premises have regional specifics based on the variety of types and volume of business services. Some regional features of the development of business centers are reflected in the works of N. V. Ignatieva (for the Kazakhstan) [2] and M. Weiss-Perrée, R. Appel-Meulenbroek, B. de Vries, and G. Rome (for the Netherlands) [3]. Various features of office buildings are reflected in various studies, including classification characteristics (T. Golden and others [4,5]). The basic principles of office space planning are considered by A. E. Vartapetova [6]. The practical value of this study includes the determination of parameters that stimulate intellectual activity and create comfortable working conditions in the objects of "intellectual production"; increasing the attractiveness of business zones for the population (including during nonworking hours) and the comprehensive use of urban areas, including reconstructed industrial zones (urban planning issues); reducing the negative impact on the environment through the use of energy efficiency technologies in the creation of objects of labor application; and increasing the expressiveness of the architectural environment through the identification of office buildings for various business activities, including through the "disclosure" of the technological process on urban landscapes.

Interesting are the features of housing placement and layout in multifunctional business complexes, which were analyzed by N. V. Dubynin [7] and V. A. Kolgashkina [8]. In these studies, attention is drawn to the fact that as a result, the shortest connections are established between places of employment and housing. This is manifested both in saving time for their implementation and in the money spent on the road from home to work and back when they are dispersed. The approach to the offices of trade enterprises is designed to increase the social efficiency of the structure. Because some of the firms renting premises in the office building are commercial, the availability of retail space will allow them to have their own store for sale, and most importantly, to advertise their goods in a prestigious place, next to the office, which is convenient for both the company and its customers. Urban commercial enterprises can also be located here, next to commercial ones, which makes this complex a center of attraction not only for business circles but also for all segments of the urban population. Such interaction is beneficial for the city, as another community center appears in its structure, organically complementing it. At the same time, for this complex,

the strengthening of its social significance is a determining factor in the development of business life.

Particular attention is paid to the works of such researchers as O. L. Bantserova, A. Kosta (the modeling of developing business centers in special economic zones) [9], P. Braidford, I. Stone, B. Tesfaye (features of the functioning of women's business centers in terms of addressing gender issues) [10], J. Chen (specifics of commercial real estate in general and business centers in particular) [11], R. M. Ellis (features of the functioning and management of serviced offices) [12], P. L. Knox, P. J. Taylor (the aspect of forming networks of business centers in which architectural bureaus providing various business services are located is emphasized) [13] and M. Kwon (the parameters of the optimal evaluation of office design from the user's perspective are analyzed) [14]. These features are crucial from the point of view of taking them into account when redeveloping office premises and office buildings from the standpoint of the post-COVID-19 specifics of work.

Promising models of the organization of spaces in business centers are highlighted in the works of M. A. Elmahadi, M. M. Tahir, M. Surat, N. M. Tawil, I. M. S. Usman (the strategy of office space stimulating communication in combination with privacy is being studied, which ensures high labor productivity) [15], P. Gaiardelli and L. Songini (emphasis is placed on the importance of integrated business models that ensure a harmonious relationship between the spatial organization of activities and financial business strategy) [16]. They consider architectural and organizational options for stimulating the effective work of office employees. The prospects for the transformation of job sites have shown in their research C. Barber, A. Laing, M. Simeone (the changes are analyzed: in the use of information technologies, in the growth of new work styles associated with remote workplaces, collaboration, work at home; the impact of this on buildings in general and on workplaces in particular is emphasized) [17], R. Harris (changes in the demand of tenants of office premises in terms of quantity and quality of leased space are shown) [18], A. Joy, B. P. Haynes (the difference in attitude to interpersonal communication spaces among employees of different ages and qualifications is emphasized) [19], J. Pitchforth, E. Nelson-White, M. van den Helder, W. Oosting (the analysis shows that zoned offices and group offices work better compared to open-plan offices) [20]. Y. Zhu, W. Huang, L. Hu detailed the specifics of traffic inside commercial buildings, including offices [21]. This study is very important from the point of view of the post-COVID-19 period. It provides a basis for fixing changes related to the desire to maintain a safe social distance. This transforms the intensity and corrects the directions of these flows.

The problems of environmental protection in the context of the organization and operation of business centers were considered: V. T. Do, A. N. Young, B. Sodagar, P. Hyde (the Vietnamese experience of moving toward sustainable architecture for office buildings) [22], V. V. Luchkina (a possible model of a resource-saving business center is analyzed) [23], P. Nahálka (environmental issues in the aspect of the architectural solution of office buildings) [24] and C. Vosloo (the historical aspect of the formation of a sustainable architecture of business centers is analyzed using specific examples) [25]. For example, M. Khalfan, on the basis of a survey of architects working in Bahrain, suggests that buildings operating on the basis of smart technologies and focused on maximum environmental conservation will become the most widespread in the post-COVID-19 period [26]. However, this trend also existed in the pre-COVID-19 period.

The features of the spatial organization of coworking are reflected in the works of N. Clifton and D. Reuschke (the motives of organizing work using the coworking method, its disadvantages and advantages are considered) [27,28]; J. Y. Huwart, G. Dichter and P. Vanrie (the space for collaboration of entrepreneurs working in the field of small business is being explored) [29]; M. Weijs-Perrée, J. van de Koevering, R. Appel-Meulenbroek and T. Arentze (the study showed that the main motivation of employees to work in coworking is to find a place to work outside the home) [30]; E. Radman, E. Johansson and P. Bosch-Sijtsema (it is indicated that the need to belong to a community at work varies from one person to another, determining the organization of the space) [31]; and E. Yang, C. Bisson and B. E.

Sanborn (various models of the space for coworking with a development perspective are considered) [32].

This question is part of the problem of open-plan offices, which is reflected in the research of A. Kaarlela-Tuomaala, R. Helenius, E. Keskinen and V. Hongisto (it is indicated that the open layout negatively affects the work of highly qualified employees) [33]; R. L. Morrison and R. K. Smollan (the disadvantages of open-plan offices can be partially compensated by aesthetic, technical, technological and organizational means) [34]; W. Y. Perera, B. A. K. S. Perera and N. S. Jayasena (the complexity of high-performance work in open-plan offices is emphasized) [35]; N. Perrin Jegen and P. Chevret (the result of the study showed that noise is considered by employees as the main source of discomfort in open-plan offices) [36]; P. J. Lee, B. K. Lee, J. Y. Jeon, M. Zhang and J. Kang (it is emphasized that noise is the main source of complaints in open-plan offices; the self-esteem of employees decreases and their performance deteriorates) [37]; and D. Węziak-Białowolska, Z. Dong and E. McNeely (the disadvantages of open-plan offices related to noise, lack of visual privacy and the complexity of individual concentration are analyzed) [38]. However, the post-COVID-19 desire to maintain optimal social distance calls into question the organization of work in the form of coworking, especially in an open-plan situation. Employees naturally tend toward isolated workplaces. This problem has not yet received sufficient coverage in scientific papers.

Issues of ensuring workplace satisfaction in offices are considered in the research of R. Appel-Meulenbroek, M. van de Kar, P. van den Berg and T. Arentze (the effectiveness of special services in the workplace and the need to expand the range of such services are questioned) [39]; I.De Been and M. Beijer (it is indicated that in "combined" offices, employees are more satisfied with communication than in traditional individual and shared offices) [40]; H. A. Earle (the importance of a comfortable workplace in the office for maintaining a workable team is indicated) [41]; L. Hartog, M. Weijs-Perrée and R. Appel-Meulenbroek (the influence of personal characteristics on job satisfaction in various types of offices is emphasized) [42]; N. Oseland (the importance of taking into account the psychological characteristics of employees when designing offices is emphasized) [43]; H. Remøy and T. J. M. van der Voordt (traditional factors of office comfort are complemented by new potentials related to sustainable development, which together determine priorities when choosing a place of work) [44]; L. Rolfö, J. Jurgen Eklund and H. Jahncke (issues related to the transition from open-plan offices to activity-oriented offices are being studied) [45]; M. Weiss-Perrée, R. Appel-Meulenbroek and T. Arentze, G. Rome (the importance of organizing places for interpersonal communication in the process of working in the office is emphasized) [46]; and K. Wijk, E. L. Bergsten and D. M. Hallman (it is indicated that when introducing activity-based jobs, it is necessary to ensure an adequate perception of significance in the process of complicated work) [47]. This is important from the point of view of the organization of the employee's workplace and their access to the field of daily services.

The problem of adaptation of the urban environment in the post-COVID-19 period is demonstrated in such studies as M. Acuto (urban problems that were emphasized during the pandemic—the emphasis is placed on the natural increase in the density of human flows in the central parts of cities, which is a critically unacceptable factor in the fight against the pandemic; accordingly, the task of improving ventilation systems and hygiene measures is being considered, which partially compensates for this shortcoming) [48]; R. Diab-Bahman and A. Al-Enzi (changes in working conditions post-COVID-19 period—the desire of employees for a hybrid combination of work in the office or at home was found, which hypothetically will increase labor productivity) [49]; N. A. Megahed and E. M. Ghoneim (the impact of the pandemic on various aspects of urban development—the expediency of applying new design and construction strategies to create more-sustainable urban development is indicated, and it is noted that appropriate factual material should be accumulated to determine these strategies) [50]; S. Papu, Sh. Pal and C. Priday (features of post-COVID-19 architecture—the impossibility of returning to the traditional practice of

design and construction is fixed, and the need for transformation of many public institutions and people's self-consciousness is pointed out) [51,52]; A. M. Salama (socio-spatial consequences of the pandemic—it is indicated that the consequences of the pandemic will manifest themselves at all levels, namely agglomerations, cities, towns, building complexes, individual buildings and premises; the consequences will affect the formation of spaces for many years to come) [53]; S. Wahba and J. Vapaavuori (urban environment response to pandemic factors—optimism is expressed about successfully overcoming the consequences of the pandemic without radically changing urban structure and design methods; the city of Helsinki is cited as a good example of a "functional city") [54]; O. Wainwright (architectural innovations in the post-COVID-19 period—doubts are expressed about the expediency of using booths for personal work, the futility of coworking is indicated and the need for large and well-ventilated work areas in offices is emphasized) [55]; and others.

The relevance of research on the processes of the post-COVID-19 adaptation of offices is high, represented by the works of L. Bergefurt, M. Weijs-Perrée, R. Appel-Meulenbroek and C. Maris (transformation of employees' attitudes toward work after switching to remote mode—the main indicator is stress due to distractions, which can be reduced by increasing personal space in the workplace) [56]; K. Jens and J. S. Gregg (specifics of behavior from the position of maintaining optimal social distance—the result of the analysis was an understanding of the differences between different age groups of employees in relation to the specifics of work in the office, including professional contacts) [57]; R. Kaysen (the problem of greater flexibility in the office work area—there are ways to change the work schedule by using a flexible method, as well as the formation of large-area spaces for business communication, as well as more-convenient and large-area workplaces) [58]; R. Molla (prospects for the organization of office space in the post-COVID-19 period—indicates the need for more personal spaces and a larger size of these spaces in the office, as well as the complication of air purification systems and greater thoroughness when cleaning offices) [59]; and A. Regodón, E. Garcia-Navalón, J. Santiago-Hernandez, E. Delgado-Rodriguez and A. Garcia-Santos (analysis of office activity in the pre-COVID-19 period from the perspective of further development—the perspective of the possibility of an employee's independent choice of a place to work in the office structure is emphasized, and the expediency of increasing the comfort of the jobs provided is emphasized) [60]. The emerging empty premises of business centers are proposed to be used for the organization of coworking (S. Manika [61]). At the same time, significant prospects are opening up for various technological innovations related to the intellectual and technological saturation of spaces for life and work (M. Umair, M. A. Cheema, O. Cheema and H. Li, H. Lu [62]).

All these works imply the preservation of business activity in the existing buildings of business centers and consider the possibilities of adapting office spaces to working conditions while maintaining optimal social distance and limiting interpersonal contacts. However, the problem lies in the fact that maintaining an optimal social distance leads to the need to increase the area occupied by the enterprise. In addition, this may not be economically feasible. It becomes necessary to transform the organizational structure of the enterprise. Accordingly, the need for working areas is reduced. The supply of rental office space begins to critically exceed the demand. The question arises of finding another way to use empty premises. The study of this problem is in the initial stage. From the point of view of working remotely, interesting observations were made on the assessment of the level of comfort and adaptation tools of residents in apartments and houses during quarantine (M.-A. El-Husseiny [63]). Potential problems arising in the transformation of business centers as a separate building or as part of an urban environment complex have been demonstrated in various studies and development programs [64–66]. As one of the aspects, the possible deterioration of the quality of housing in redeveloped buildings is considered in connection with the problem of state control weakening (see *Planning Deregulation, Material Impacts, and Everyday Practices: The Case of Permitted Development in England*, by Ben Clifford [67]). However, this problem is not relevant for all countries. For example, in Kazakhstan, there is a multistage state control over the quality of any commissioned housing at all stages—from

design to construction. This also applies to social apartments provided free of charge by the state and highly comfortable apartments for sale.

These materials show the degree of study achieved at the moment of the problem of the development of the architecture of business activity centers. However, the actual business centers as buildings or complexes of multifunctional business activity for several companies have not yet been the subject of independent research. Combinations of various components of business activity that determine the functional fullness of business centers of various sizes and specializations are not emphasized. In addition, some architectural features of Kazakhstan's business centers were emphasized at the dissertation level more than 10 years ago (N.V.Ignatieva, 2010). During this time, a large amount of new material has appeared, which has not yet been introduced into scientific use.

These features of the existing degree of study determined the expediency of increasing knowledge on a number of general and particular issues of the achieved level of development of the architecture of Kazakhstan's business centers. Accordingly, the scientific novelty of the conducted research lies in the analysis for the first time of the specifics of the modern practice of the development of architecture of business centers in Kazakhstan in the context of the world architectural process from the standpoint of the specifics of their formation, urban planning position, spatial planning solutions and features of functioning.

The conducted research has achieved results, having the following scientific, theoretical and practical significance: the research carried out by the authors allowed us to develop theoretical provisions that together solve a socially and culturally important scientific problem that determines the possibility of predicting the further development of the typology of business centers on the basis of the results achieved; for the first time, business centers are considered as a typologically independent object, including in various combinations various types of activities for the organization of product sales, and not only office and related auxiliary premises; for the first time, more than 400 Kazakhstan's objects are being introduced into scientific use, which had not been involved for multiaspect analysis before; for the first time, a number of objects in Kazakhstan are considered from the perspective of the specifics of the development of the architecture of business centers; and the scope is expanding and the degree of study of the architecture of Kazakhstan is deepening. Another aspect of the novelty of the study is the consideration of the possibilities of adapting existing business centers to the changed nature of work. One of the possible directions, namely redevelopment in order to turn into residential buildings or hotels, is detailed. All this makes it possible to apply the results of the research in further scientific, educational, methodological and applied works. The object of the study is buildings and complexes designed for business activity on the organization of sales of products by various users, which are defined in the work by the name of the business center. The subject of the study is the regional peculiarities of the location of business centers in a locality and their spatial planning solutions from the standpoint of the degree of its adaptability to the requests of various tenants. In general, 703 objects were considered during the analysis, including 472 business centers on the territory of the Republic of Kazakhstan.

In the final part of the work, the topical issue of the possible adaptation of business centers to working conditions in the post-COVID-19 period is considered. The generalized results of the conducted research are presented in this article.

2. Materials and Methods

The specifics of the object and subject of research, the general scientific dialectical method of sequential collection of materials, their study and an analysis for the formulation of appropriate conclusions are taken into account and adopted as the basic research method.

In accordance with this, the first business centers that appeared on the territory of Kazakhstan are briefly described. The most typical examples of modern business centers are also shown. Special attention is paid to the peculiarities of the placement of business centers in the structure of modern cities of Kazakhstan. Cities with a population of more than a hundred thousand people were used as examples. Further attention is paid to the

functional, spatial planning, architectural and artistic features of business centers. These characteristics are presented in the corresponding tables. The post-pandemic trend of a sharp decrease in the need for office space (especially in multistory buildings) are taken into account, and the possibilities of adapting these areas are considered. Business spaces have several characteristics that have been interpreted in different ways over the course of evolution, demonstrating a variety of combinations. These are such characteristics as open and closed; fixed and nonfixed, temporary and permanent; transformable and nontransformable; and individual and mass. Within these characteristics, there was also a wide variety of intermediate forms with varying degrees of proximity to the polar criteria: semiopen, moving, short term and long term, partially transformable and group. Most of the business centers are in medium and large cities of modern Kazakhstan. The location of these cities is shown in Figure 1.

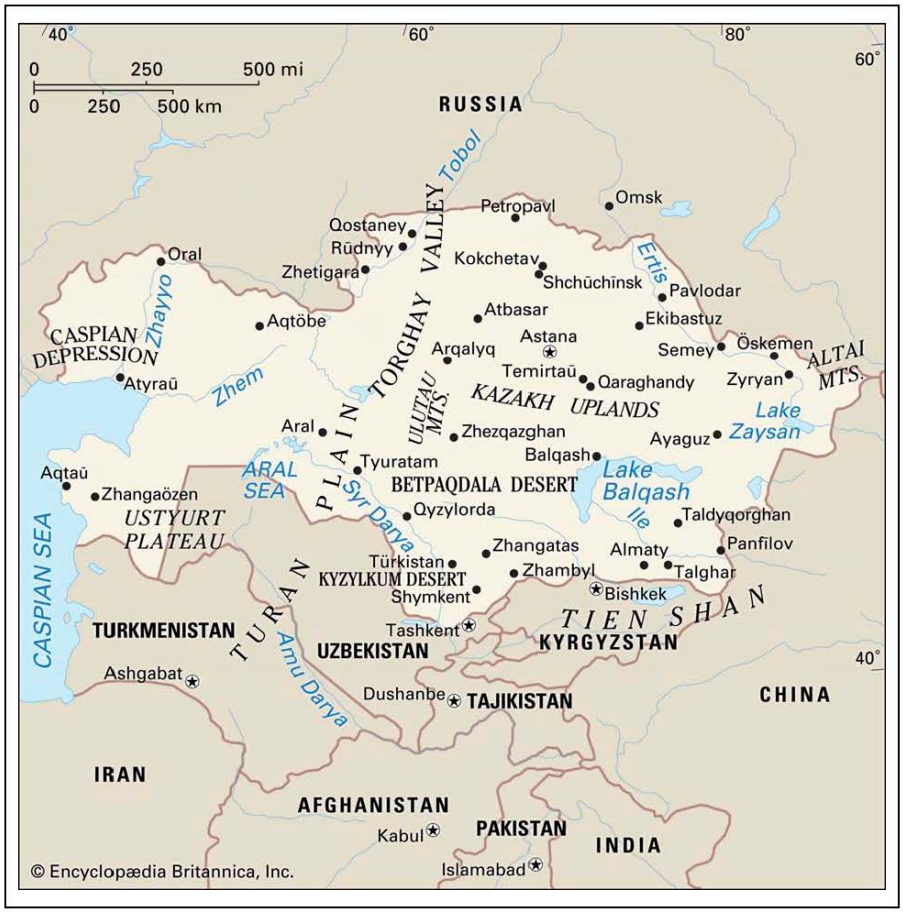


Figure 1. The locations of the major cities of Kazakhstan (map) [68].

In the territory of modern Kazakhstan in the late 19th to the early 20th century, business centers appeared in cities, reflecting mainly the need to provide business space for entrepreneurs' own business activity, although there were also examples of the purposeful construction of buildings for rent. For example, the two-story VANYUSHINS's HOUSE in Uralsk (1870) was rented by a merchants' club, using it as a meeting place, holding negotiations and organizing entertainment. For some time, part of the building was occupied by hotel rooms and a complex of officers' meeting rooms. The two-story ARKEL's HOUSE in Petropavlovsk (1891) housed shops, offices and a hotel. The one-story OKHAPKIN's HOUSE in Pavlodar (1908) was originally intended by the owners for rental, and insurance and transport organizations worked in it. The three-story KARAEVS's HOUSE in Uralsk (1900) was used as a hotel, a club of entrepreneurs, shops, a restaurant and office premises. A one-story building with a tower superstructure and an observation deck on a hipped

roof, DEROV's HOUSE in Pavlodar (1896, arch. P.P.Batov), housed a complex of shops and an office. These examples are shown in Figure 2. Now museums, libraries and educational institutions are in these buildings.

Figure 2. Business centers of Kazakhstan in the second half of the 19th to the early 20th century: (**1**) The DEROV'S HOUSE, Pavlodar, 1896 [69]; (**2**) The OKHAPKIN'S HOUSE, Pavlodar, 1908 [70]; (**3**) The VANYUSHIN'S HOUSE, Uralsk, 1870 [71]; (**4**) The ARKEL'S HOUSE, Petropavlovsk, 1891 [72]; and (**5**) KARAEV'S HOUSE, Ural'sk, 1900 [73].

Because of the change in socioeconomic relations at the end of the 1910s, business centers in Kazakhstan, as a specific type of enterprise, disappeared. The buildings were occupied by various government agencies and public organizations.

In Kazakhstan, the active development of business centers resumed after an 80-year break in the early 1990s. The features of business centers in the cities of Kazakhstan are as follows. The location of business centers in the cities of Kazakhstan is naturally determined by the population density in one or another part of the city if the tenants are in offices with a turnover corresponding to the definitions of a "small" and a "medium" business or administrative and business activity if the tenants are in offices that fall under the definitions of a "large" business. From the point of view of the city structure, business centers are located as follows: concentrated, linear, peripheral and dispersed. These schemes are shown in Figure 3.

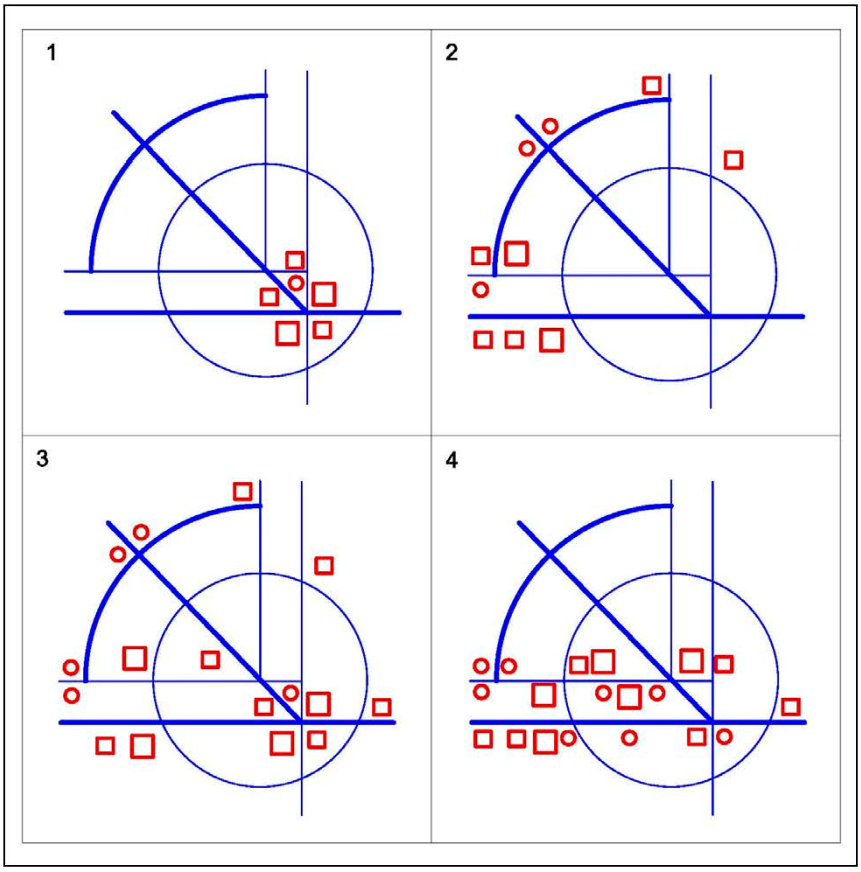


Figure 3. The location of business centers in the structure of the city: (**1**) concentrated; (**2**) peripheral; (**3**) dispersed; and (**4**) linear.

The placement of business centers in the planning, functional and transport structure of the cities of Kazakhstan is peculiar [74].

In Astana, they are fairly evenly distributed throughout the territory. The exception is the Saryarka district, where there are practically none among the estate residential and industrial developments in the central and western parts, and the bulk is concentrated in the eastern part, closer to Republic Ave and the area of the railway station and bus station. The business centers in the Yesil district are along the northern and eastern borders, along the Korgalzhin highway and between Kobanbai Batyr Ave and the Yesil River, where the largest of them are. The location of business centers is evenly distributed across the territory of the Almaty district. The most remote from the city center from the east is the six-story business center K; from the south—the fifteen-story BAITEREK and the business center on the territory of EXPO–2017; from the west—the five-story MakTAU; from the north—in the two-story annex Alliance.

In Almaty, business centers are evenly distributed in the central part of the city between Ryskulov Ave, Sain Street, Al-Farabi Ave and the Malaya Almatinka River, as well as in the area of the Almaty-1 railway station. The most remote are the built-in WORLD TRADE CENTER—from the north; the six-story CAR CITY—in the west; the two-story building GRANITE REALTY INVESTMENT—from the south; the four-story building FORTE—in the west. In Shymkent, business centers are dispersed throughout the central part. They are not among the estate and industrial development of the eastern part of the city, the airport area in the west, the Turan microdistrict from the north or the Badam microdistrict in the south. In the west, the most remote is the AZAD integrated business center occupying the first floor of the building; in the south, the TOMIRIS integrated business center occupying the first two floors; in the east, the ZANGAR business center occupying all seven floors; and in the north, the KAYNAR business center in a detached six-story building.

In Aktobe, with the exception of the Astana district in the south and southeast, business centers are evenly dispersed throughout the territory: the most remote in the south is the KENDALA business center in a detached building; in the west—the SHANGHAI business center occupying a two-story building; on the north side of the city—the KADAM PLUS built-in business center; in the east there is a built-in business center, NUR-KAN. In Karaganda, business centers are mainly concentrated along Bukhar Zhyrau Ave. They are not in the Mikhailovka microdistrict on the western side and among the mixed developments of the Kazybek bidistrict in the east. On the south side of the city, the business center OFFICE 33, occupying a seven-story building, is the most remote from its center; in the east, it is the business center VZLETKA, occupying a two-story building; from the north, it is a three-story business center on Mustafina Street; from the south, it is the business center BUSINESS HOUSE, occupying a five-story building. In Taraz, business centers are mainly only in the central part and are almost completely absent in peripheral areas. The most remote from the west side is the DAVMIR business center, occupying a two-level pavilion; in the southwest is the two-story ARAI CITY Co TARAZ KALASY business center; in the east is the ALAMAN TRADING HOUSE business center in a two-level pavilion; on the north side is a business center consisting of several pavilions SAUSAGE PRODUCTS SHAH.

In Pavlodar, large business centers are concentrated in the area of the intersection of Satpayev and Estay streets. In the residential district Lesozavod, business centers are in the south on the street. Toraighyrova, in the residential district Vostochny business centers are only in the west on the street. Yes, there are no business centers in the Usolsky microdistrict. The northernmost in relation to the central part of the city is the MOTIF business center, located in a two-story annex; on the west side is the built-in SCORPION business center; on the south side is a two-story business center on Zhusupa Street; on the east side is an eight-story business center, SMART. In Ust-Kamenogorsk, business centers are concentrated in the old part of the city on the sides of Kazakhstan Street and Pobedy Ave. On the south side, the most remote from the center is the attached four-story business center ANTARES; on the east side is the six-story detached business center KAZAKHSTAN; and on the northwest side is the built-in business center MEGAPOLIS.

In Kyzylorda, business centers are concentrated along the central streets running along the Syr-Darya riverbed. On the west side is a built-in business center, SYRDARIA; on the south side is a two-level pavilion of the business center ALUR AVTO KYZYLORDA; on the east side is a two-story business center on Muratbayev Street; and on the north side is a one-story business center, WINTER AND SUMMER SERVICE CENTER. In Atyrau, most business centers are in the central part. The most remote from the center from the southwest side is the attached three-story business center BALYKSHY; from the south side is the three-story business center LUX; and from the east side is the built-in business center DARGO. In Kostanay, business centers are concentrated in the area around the central park. On the west side, the three-story business center GRAND is the most remote; on the north side—in a mixed-story building KOSTANAY PLAZA; on the east side—the business center SHAYAN; and on the southwest side—the four-story business center BOSS. In Semey, the vast majority of business centers are in the historical central part. The most remote from the central part from the southwest beyond the river. Irtysh is a business center in the form of a complex of buildings, AUTOMARKET; on the east side is a two-story business center, ZHIBEK ZHOLY. In Uralsk, business centers are evenly distributed throughout the city. The southernmost is a six-story attached business center, CITY ORTALYGY; the westernmost is a three-story business center on Mametova Street; the northernmost is a three-story business center, PARASAT; the easternmost is a three-story business center, ALMAZ. In Petropavlovsk, the main facilities are dispersed. The largest are two—a four-story, YESIL, and a multistory, QUARTER.

In Aktau, business centers are evenly distributed throughout the city. The southernmost is the built-in three-story business center ATA–MURA; the easternmost is the four-story business center ABC; the northernmost is the three-story business center ZHAINA; the westernmost is the two-story business center LOTUS.KZ. In Temirtau, business centers

are in the northwestern part. The westernmost by location is the attached four-story business center EMPIRE OF BUSINESS; the northernmost is the redesigned five-story business center EXPRESS; and the easternmost is the built-in business center HILLARY. In Turkestan, a few small differently oriented business centers are in the northern part of the city. The largest is MEGACITY. In Taldykorgan, business centers are concentrated on the north and east sides of the railway station area. The largest are two business centers of the same name located nearby ZHYGER; business center TAMERLANE; and business center SATTI. In Kokshetau, business centers are near the intersection of Nazarbayev Ave and Auezov Street. The northernmost is the three-story business center IMANA; the southernmost is the three-story business center ROYAL; the westernmost is the built-in business center ISKER; the easternmost is the built-in business center DAMU-BUSINESS. In Ekibastuz, small business centers are concentrated on Zhusupa Street and Auezova Street. The largest is the freestanding EKIBASTUZ REGIONAL BUSINESS CENTER. In Rudny, business centers are located mainly along Lenin Street. The largest business center of Rudny is the built-in business center ORANGE. These schemes are shown in Figures 4–6.

The modern Kazakhstan's practice of forming business spaces is mainly in line with global trends. One of the reasons for this is the presence on the market of a significant number of companies that are completely foreign or have "foreign participation". These companies have their own internal regulations for the organization of commercial activities, which implies that they choose business spaces for their work that meet these criteria either initially or after appropriate reconstruction. Following their example, some domestic companies, especially those with access to the international market, are beginning to build their work. Accordingly, the spaces provided for rent in most cases take this into account, and small domestic companies operating in the domestic market consider it organizationally and financially expedient for themselves to adapt to these specifics of the market. The most typical examples of modern business centers in Kazakhstan are discussed below.

The ALMATY HOUSE-BUILDING PLANT business center in Almaty (1985, arch. N.Boriskin) is in a nine-story, two-section, large-panel building. Initially, the building had an administrative purpose, but then it was repurposed for rented offices. The adaptation of the sectional layout of a residential building with one staircase to the function of a business center with two stairs was carried out by forming a through passage through the butt wall. The layout has acquired the features of a mixed type, providing the possibility of renting both six separate rooms with two shared bathrooms and two groups of two and four rooms with independent bathrooms. The nine-story business center SEVEN in Astana (2020) has a layout that allows one to get into four groups of offices from the central hall. The offices have a different area and include several rooms each. The minimum leased area is 79.0 m^2. There is underground parking. The ESENTAI TOWER complex in Almaty (2008, arch. Skidmore, Owings & Merrill) in a 37-story building with a four-level underground parking area with office premises on the first 14 floors; a hotel is located above; and serviced apartments occupy the upper eight floors. The complex also includes a shopping center (four floors with four-level underground parking), residential buildings (three blocks of 21 floors each with three-level underground parking) and a fitness center (four floors with two-level underground parking). Planning premises for office activities are solved according to the cabinet, open and combined principles. These rooms, grouped around a central communication hub with stairwells, elevators, bathrooms and engineering rooms, also include meeting rooms, recreation areas and canteens. The ALMATY RESIDENCE complex in Almaty (2014, arch. K. I. Samoilov, EMS), classified as an executive class business center, is in an L-shaped nine-story building above a restaurant in the basement and an underground two-level parking lot. The communication node stretched along the inside (stairwells, cargo and passenger elevators; groups of bathrooms; and inventory storerooms) leaves free space, which is offered to tenants for the formation of offices with a cabinet or free layout. The common entrance is formed by the lobby, reception panel and bathrooms. For the business space on the ground floor, there is the possibility of organizing

an independent entrance. On floors 4 and 5 there are two-, three- and four-room apartments. The residential part has an independent entrance with a stairwell and an elevator. These examples are shown in Figure 7.

Figure 4. The locations of the main business centers in the city structure: (**1**) Astana [75]; (**2**) Almaty [76]; (**3**) Shymkent [77]; (**4**) Aktobe [78]; (**5**) Karaganda [79]; (**6**) Taraz [80]; (**7**) Ust-Kamenogorsk [81]; and (**8**) Pavlodar [82].

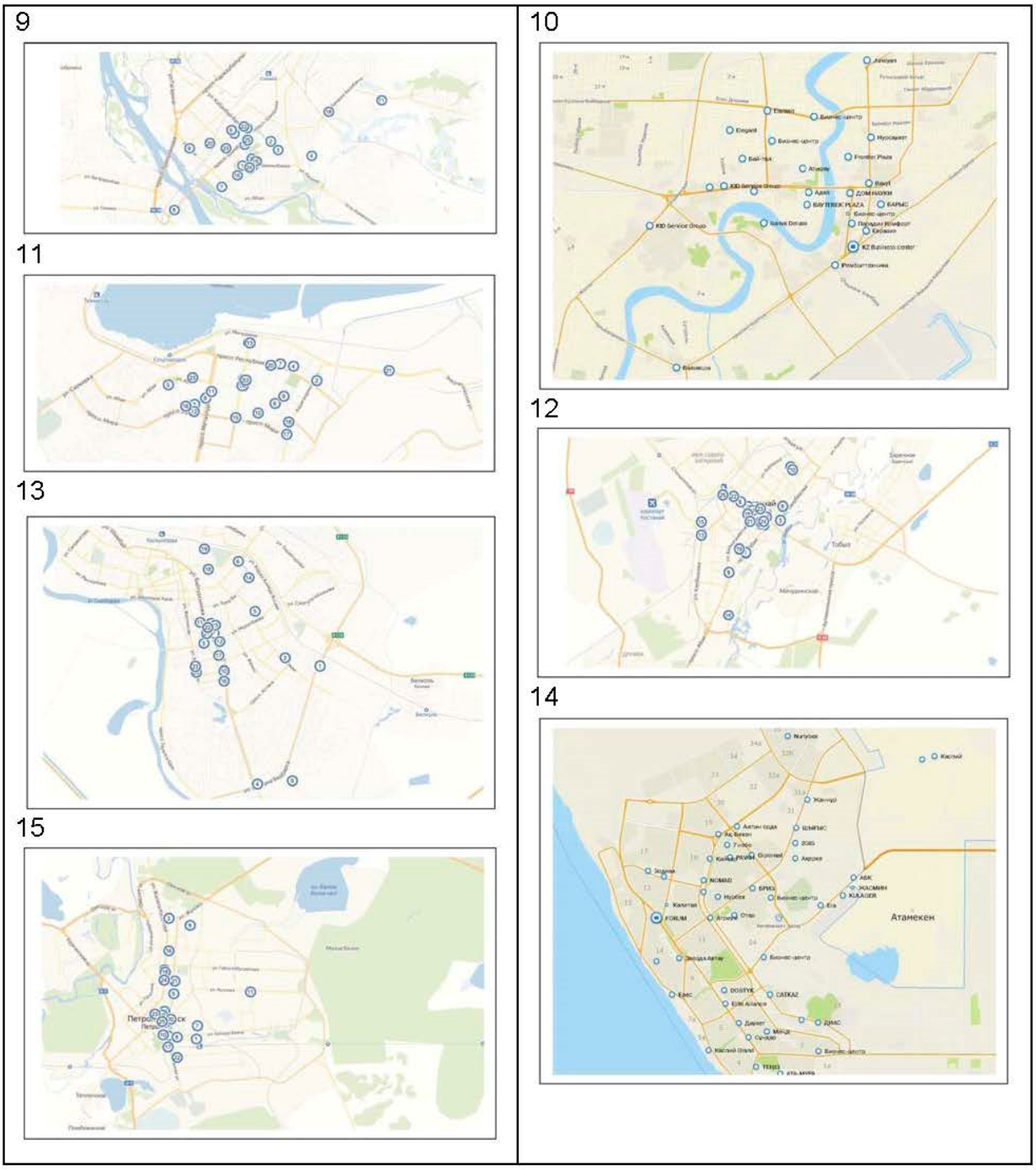


Figure 5. The locations of the main business centers in the city structure: (**9**) Semey [83]; (**10**) Atyrau [84]; (**11**) Temirtau [85]; (**12**) Kostanay [86]; (**13**) Kyzylorda [87]; (**14**) Aktau [88]; and (**15**) Petropavlovsk [89].

Figure 6. The locations of the main business centers in the city structure: (**16**) Ural'sk [90]; (**17**) Turkestan [91]; (**18**) Taldykorgan [92]; (**19**) Kokshetau [93]; (**20**) Ekibastuz [94]; and (**21**) Rudnyi [95].

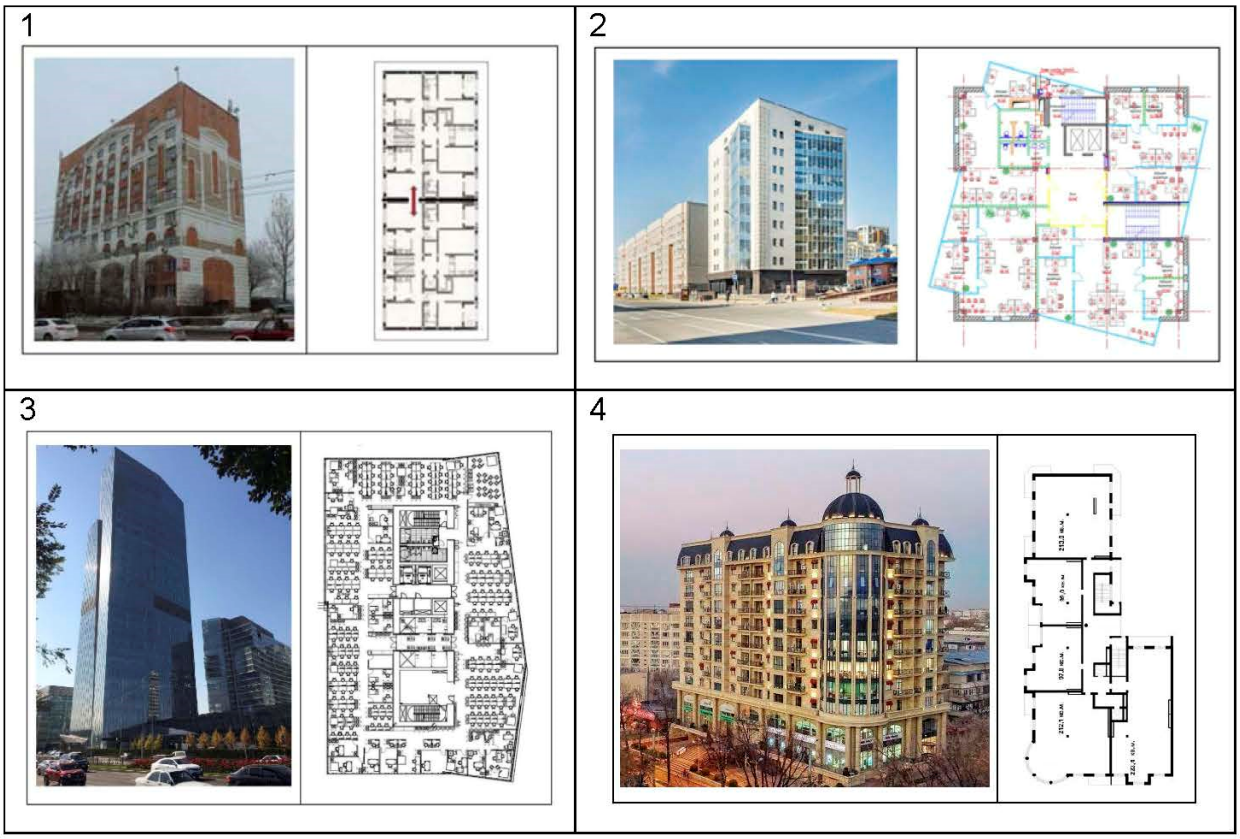


Figure 7. Kazakhstan's business centers of the late 20th to the early 21st century: (**1**) The ALMATY HOUSE-BUILDING PLANT, Almaty, 1985 [96]; (**2**) The SEVEN, Astana, 2020 [97]; (**3**) The ESENTAI TOWER, Almaty, 2008 [98]; and (**4**) The ALMATY RESIDENCE, Almaty, 2014 [99].

The SAT business center (2006) in Almaty is a seven-story building with an underground parking lot. The total area is 14.500 m^2. The layout of the rented premises can be carried out according to any scheme. However, the preferred option is an open space because the building has a significant width for this type of buildings—36.2 m in axes. With a cabinet layout, a large area appears, devoid of natural light. Accordingly, it is unsuitable for the organization of permanent jobs. Three stairwells, on opposite sides at the outer walls, are connected by a corridor; an elevator hall and sanitary units are located at the main staircase. The TALAN TOWERS complex in Astana (2017, arch. Skidmore, Owings & Merrill) is classified as a public and business complex. Its spatial solution consists of two tower volumes (25 floors: hotel—157 rooms and 27 residences; 30 floors: business center—a total area of 31.908 m^2), united by a three-story podium above the parking lot. The CONGRESS OFFICE complex in Astana (2016, arch. Adrian Smith+Gordon Gill Architecture) is a five-story building. The composition of the premises is as follows: office premises—1205.00 m^2 on the ground floor, 1448.00 m^2 on the second, third and fourth floors, 927.00 m^2 on the fifth floor; central hall—482.00 m^2 on the first floor, 217.00 m^2 on the second, third and fourth floors, 266.90 m^2 on the fifth floor; communication node and office premises—190.00 m^2 on the first floor, 57.00 m^2 on the second, third and fourth floors, 59.00 m^2 on the fifth floor; terrace—560.00 m^2 on the fifth floor; parking—2403.00 m^2 with a core; and service rooms—573.00 m^2. The ABU DHABI PLAZA complex in Astana (2022, arch. Foster and Partners) will form five buildings of various stories and functional purpose. The 75-story block includes office and residential premises, the 29-story and 30-story blocks are designed for offices, the 15-story block is designed for apartments. The complex includes a hotel and a shopping center. It is possible to organize the work of about 17,000 employees in office premises, 85.000 m^2. are offered for rent (the minimum

application is 200 m^2). An observation deck is formed in the upper part of the highest block. These examples are shown in Figure 8.

Figure 8. Kazakhstan's business centers of the early 21st century: (**1**) the SAT, Almaty, 2006 [100]; (**2**) the TALAN TOWERS, Astana, 2017 [101]; (**3**) the CONGRESS OFFICE, Astana, 2016 [102]; and (**4**) the ABU DHABI PLAZA, Astana, 2022 [103].

Modern business centers in the cities of Kazakhstan are represented by newly built, reconstructed or repurposed detached, built-in and attached buildings of various stories. They have a different single- or multiblock space-planning solution, and their architectural and artistic solution either takes into account or contrasts with the urban context. Mobile business centers are represented as collapsible buildings based on a modular scheme, as well as single or interlocked sea containers in one or more levels. Sometimes modular buildings are combined with interlocked containers. When moving containers, they can be either reconstructed or simply rearranged while preserving the function. The modern set of business centers in Kazakhstan allows them to be differentiated according to several parameters: composition of functions, the specifics of work, origin, number of floors, spatial solution, complexity, self-sufficiency, time of operation, position in space, changeability, layout and architectural and artistic solutions.

So, **according to the composition of the basic functions** (examples are shown in Figures 9 and 10), there are offices; offices, a congress hall; offices, shops; offices, shops, a congress hall; offices, shops, warehouses; offices, warehouses; offices, a housing; offices, a housing, a congress hall; offices, a housing, shops, warehouses, a congress hall; offices, housing, warehouses; and offices, a housing, shops. The ratio of the areas of premises for the implementation of these functions in the building of the business center is not stable and depends on the situation in the market of certain services. Each component of the basic functions has a different degree of autonomy, depending on its significance for a particular period of activity in the complex. This applies to a lesser extent as a set of com5munication and auxiliary rooms (lobbies, halls, corridors, bathrooms, stairwells, elevators, escalators, meal rooms, rest rooms of the main and service personnel, groups of rooms of security and engineering services, wardrobes, storage rooms of cleaning equipment, rooms of engineering systems and waste disposal systems), as well as general, separate or partially combined engineering systems (heating, ventilation, air conditioning, hot and cold water supply, sewerage, electricity and low-current and fiber-optic networks). It is also possible

to practically any mutual arrangement of a group of office and related premises. There is a floor-by-floor, block-by-block differentiation of office and related groups of premises or various integrated schemes.

THE DIFFERENTIATION OF BUSINESS CENTERS ACCORDING TO THE COMPOSITION OF THE BASIC FUNCTIONS		
№№	*an Example*	*a Picture*
1	*2*	*3*
1	**Offices:** the “BSN PLAZA”, Almaty	
2	**Offices, Congress halls:** the “AFFARI”, Astana	
3	**Offices, Shops:** the “ASTANALYK”, Astana	
4	**Offices, Shops, Congress halls:** the “MOSKWA”, Astana	
5	**Offices, Shops, Warehouses:** the “NUR TAU”, Astana	
6	**Offices, Warehouses:** the “AZIA-MOST”, Almaty	

Figure 9. The differentiation of business centers by the composition of basic functions: (**1**) the BSN PLAZA, Almaty [104]; (**2**) the AFFARI, Astana [105]; (**3**) the ASTANALYK, Astana [106]; (**4**) the MOSKVA, Astana [107]; (**5**) the NUR TAU, Astana [108]; and (**6**) the ASIA-MOST, Almaty [109].

THE DIFFERENTIATION OF BUSINESS CENTERS ACCORDING TO THE COMPOSITION OF THE BASIC FUNCTIONS		
№№	*an Example*	*a Picture*
1	*2*	*3*
7	**Offices, Shops, Warehouses, Congress halls:** the "ZHYBEK ZHOLY", Almaty	
8	**Offices, Shops, Housings:** the "NA VODNO-ZELENOM BUL'VARE", Astana	
9	**Offices, Congress halls, Housings:** the "PREMIER OF ALATAU", Almaty	
10	**Offices, Housings:** the "ALMATY RESIDENCE", Almaty	
11	**Offices, Warehouses, Housings:** the "CASPI ASTANA", Astana	
12	**Offices, Warehouses, Shops, Congress halls, Housings:** the "NURLY TAU", Almaty	

Figure 10. The differentiation of business centers by the composition of basic functions: (**7**) the ZHYBEK ZHOLY, Almaty [110]; (**8**) the NA VODNO-ZELENOM BUL'VARE, Astana [111]; (**9**) the PREMIER OF ALATAU, Almaty [112]; (**10**) the ALMATY RESIDENCE, Almaty [113]; (**11**) the CASPI ASTANA, Astana [114]; and (**12**) the NURLY TAU, Almaty [115].

Moreover, the relative position of these groups of premises is not due to regulatory restrictions, with the exception of sanitary and epidemiological restrictions (e.g., the minimum height of various types of premises, the inadmissibility of placing sanitary units above residential, working and partially commercial and warehouse premises, the inadmissibility of single-level or floor-by-floor proximity of working and residential premises with engineering support systems and elevator shafts, etc.) and fire-evacuation requirements (e.g., the number of exits depending on the number of people arriving in the room at the

same time, the length of corridors to stairwells, the width and natural illumination of corridors and stairwells, including the so-called nonsmokable stairwells, the number of stairwells themselves, the distance between them, their types, the presence of vestibules in front of them, the width of staircases, the opening directions and the width of doors, a combination of electromechanical and manual opening of doors of various types, solution of alarm systems, fire extinguishing and evacuation from storage rooms of various degrees of fire and explosion hazards, the presence of the division of floors into fire-fighting compartments, depending on the floor area, etc.). The set and interpretation of these requirements differ in different countries.

A congress hall is simply the organization of mass events of various levels. They include both large-capacity halls with the placement of users in stationary seats and in a relatively freestanding position or on chairs, as well as multi-sized rooms for short-term individual or group work. Moreover, in some cases, most of these premises provide for the possibility of their transformation in terms of capacity changes. In this group, rooms or areas of information support are allocated.

Housing is represented by apartments in permanent ownership, apartments rented for a while and hotel rooms. These elements have different areas and comfort levels. Their mutual disposition can be either differentiated by groups of different areas, comfort and types or differently integrated.

Stores intended for the exhibition and sale of goods operated by tenants of the premises in the building and related products have both service facilities integrated into the general complex and a set of narrowly specialized premises. The warehouses accompanying the stores are represented by premises for the operational or basic volume of goods. These premises, depending on the specifics of the goods, are equipped with appropriate systems of supply and exhaust ventilation, air conditioning, cooling, fire-extinguishing and alarm systems that differ from other functional groups of premises. There are separate rooms for storing containers and packaging, as well as performing loading and unloading operations.

Some groups of premises do not have an independent value that affects the type of business center; however, they can be represented in different numbers and combinations in business centers of various types. These are premises and platforms for storing cars of employees and visitors at different times with differentiated, integrated or mixed access, helicopter pads on the roof, separate floors or on the adjacent territory, mass or individual catering enterprises, leisure and recreation complexes and consumer service facilities. Medical institutions for emergency care are separately singled out, usually in large business centers.

Premises and platforms for storing cars and buses are equipped to varying degrees with conventional or mechanized parking spaces, as well as a minimum set of repair and maintenance services. Helipads have specific restrictions on access to aircraft. They have a normative independent system of communication and engineering support. Catering establishments imply the possibility of both conventional and automated express service (differentiated in a complex or floor-by-floor, as well as on common food courts), and they come in the form of traditionally organized restaurants, cafes, snack bars, canteens, bars and buffets. Leisure and recreation complexes include cinema and theater enterprises, exhibition and recreational areas, information bureaus, game halls and rooms for various types of gymnastics and water sports. The complex of consumer service premises includes hairdressers, massage parlors, reception points of laundries and dry cleaners, ateliers, shoe repair shops and small household appliances, and grocery order tables.

All groups of premises in business centers for various functions that complement office rooms can be designed for employees and clients of offices, have free access for visitors not related to the activities of offices located in the business center (mixed use) or have one or another differentiation in use. Accordingly, they have different sizes, nomenclature and scope of services provided. Examples are as follows: offices—the BSN PLAZA, Almaty; offices, congress halls—the AFFARI, Astana; offices, shops—the ASTANALYK, Astana; Offices, Shops, Congress halls—the MOSKWA, Astana; offices, shops, warehouses—the

NUR TAU, Astana; offices, warehouses—the AZIA-MOST, Almaty; offices, shops, warehouses, congress halls—the ZHYBEK ZHOLY, Almaty; offices, shops, housings—the NA VODNO-ZELENOM BUL'VARE, Astana; offices, congress halls, housings—the PREMIER OF ALATAU, Almaty; offices, housings—the ALMATY RESIDENCE, Almaty; offices, warehouses, housings—the CASPI ASTANA, Astana; and offices, warehouses, shops, congress halls, housings—the NURLY TAU, Almaty.

According the specifics of the work (examples are shown in Figure 11) differ: specialized or universal. The range of services provided to tenants determines one or another specific detail of the business center, which was considered earlier as a variety of basic functions. Domestic practice demonstrates a significant number of examples of business centers that are commercially focused on providing premises for only one type, such as offices, or several types of activities. Accordingly, the tenant focuses on this specialized assortment. However, a sufficient place in the market is occupied by individual buildings and complexes, in the rental offers of premises in which the expression "for any type of activity" is used. This versatility implies either an already-existing set of premises for various types of activities or the willingness of the lessor to carry out, on acceptable terms, the redevelopment or reconstruction of the entire building or part of it corresponding to the tenant's requests. Examples are as follows: specialized buildings—the GAGARIN, Almaty; universal buildings—the ASTANA, Taldykorgan.

THE DIFFERENTIATION OF BUSINESS CENTERS ACCORDING TO THE SPECIFICS OF WORK		
№№	*an Example*	*a Picture*
1	*2*	*3*
1	**Specialized buildings:** the "GAGARIN", Almaty	
2	**Universal buildings:** the "ASTANA", Taldykorgan	

Figure 11. The differentiation of business centers according to the specifics of work: (**1**) the GAGARIN, Almaty [116] and (**2**) the ASTANA, Taldykorgan [117].

Business centers also **differ in origin** (examples are shown in Figure 12): retaining the original function of a business center; repurposed into business centers; or reconstructed into business centers. The number of buildings of business centers of various origins differs by country, region and city. However, for example, unlike foreign practice, most of the buildings of business centers in the territory of Kazakhstan in the 1990s appeared as a result of the repurposing of some of the existing buildings of administrative, household and scientific design purposes, built in the 1960s–1980s. One or another part of the building was initially repurposed. Among other things, this was because there was a corridor scheme in these buildings, which quite freely allowed for varying the size of the areas put up for rent while maintaining the existing system of sanitary and household services and engineering support networks. The normatively fixed and implemented layout with at least two evacuation exits from each floor, the elevator system developed with a number of floors of more than six determined the commercial attractiveness of these buildings. Then these buildings began to be partially or completely reconstructed and completed, taking into account the increasing need for rental space of various sizes. Some of the business centers began to be located in the workshops of industrial enterprises that were

vacated because of the change in activity. The large height of the floor, the presence of a developed transport infrastructure (including sometimes railway branches) and convenient maneuvering systems for vehicles on the target area made it possible to place office premises on the mezzanine and in the main volume—warehouse, exhibition and retail premises. The presence of large free spaces in the workshops allowed the owner to maneuver quickly in the field of planning in accordance with the commercial model of the tenant's work. Small business centers began to form on the purchased ground floors of residential buildings and dormitories. The possibility of organizing a legally binding entrance/exit directly to the house territory or street, independent of the main residential part, turned out to be quite popular for the functioning of offices, small cultural and consumer services and trade enterprises. New, specialized buildings of business centers with different floors, layouts and specializations began to appear. Since the first years of the coming century, the reserve for reprofiling and reconstruction has been almost exhausted and all new business centers have appeared in specially constructed new buildings. Examples are as follows: with the original function of a business center—the GRAND ASIA, Almaty; repurposed buildings—the RESPUBLICA, Almaty; and reconstructed buildings—the A&F, Almaty.

THE DIFFERENTIATION OF BUSINESS CENTERS BY ORIGIN		
№№	*an Example*	*a Picture*
1	*2*	*3*
1	**With the original function of a business center:** the "GRAND ASIA", Almaty	
2	**Repurposed buildings:** the "RESPUBLICA", Almaty	
3	**Reconstructed buildings:** the "A&F", Almaty	

Figure 12. The differentiation of business centers by origin: (**1**) the GRAND ASIA, Almaty [118]; (**2**) the RESPUBLICA, Almaty [119]; and (**3**) the A&F, Almaty [120].

A significant factor of differentiation is **the difference in number of stories** (examples are shown in Figure 13): single-story; medium-story; multistory; high-rise; and mixed number of stories. The number of floors of business centers, both in repurposed and in new buildings, depends on both urban planning conditions (mainly the construction site) and the strategy of the lessor. As for any other type of building, a small number of floors makes it convenient from the point of view of small, sometimes competing tenants, to organize isolated entrances and exits for each of them, each with its own plot in front of the building, which allows one to focus the consumer's attention. For medium and large tenants, a small number of floors is also convenient from the standpoint of differentiating the entrances of employees and customers, delivery and dispatch of goods, interpreted as "psychologically comfortable" proximity to the ground with green areas in front of windows, etc. As an advantage, the significantly lower capacity of the elevator economy is also put forward. Sometimes such complexes of low-rise business centers with a developed self-sufficient infrastructure are called campuses. Multistory buildings can be considered as

having advantages in terms of perception in an urban context. To a lesser extent, they need an independent accompanying infrastructure, because it can be sufficiently represented in the surrounding urban development (cultural and consumer services, catering and parking lots). The location in the central parts of the cities of these business centers allows one to create great logistical convenience for customers. Some tenants appreciate the panoramic view of the surrounding area, although the actual use of these buildings comes with certain difficulties in organizing the controlled movement of flows of employees and visitors on the floors. Examples are as follows: low-rise buildings—the FIRDAWS, Temirtau; medium-rise buildings—the KERUEN, Almaty; multistory buildings—the BAIKONYR, Almaty; high-rise buildings—the SAMAL TOWERS, Almaty; and mixed-story buildings—the ALMATY TOWERS, Almaty.

THE DIFFERENTIATION OF BUSINESS CENTERS BY NUMBER OF FLOORS

№№	an Example	a Picture
1	2	3
1	**Low-rise buildings:** the "FIRDAWS", Temirtau	
2	**Medium-rise buildings:** the "KERUEN", Almaty	
3	**Multi-storey buildings:** the "BAIKONYR", Almaty	
4	**High-rise buildings:** the "SAMAL TOWERS", Almaty	
5	**Mixed-storey buildings:** the "ALMATY TOWERS", Almaty	

Figure 13. The differentiation of business centers by number of floors: (**1**) the FIRDAWS, Temirtau [121]; (**2**) the KERUEN, Almaty [122]; (**3**) the BAIKONYR, Almaty [123]; (**4**) the SAMAL TOWERS, Almaty [124]; and (**5**) the ALMATY TOWERS, Almaty [125].

The specifics of functioning determine as a parameter of differentiation of an array of objects the separation according **to the infrastructural self-sufficiency** (examples are shown in Figure 14): autonomous and non-autonomous. Depending on the town-planning location of the building and the commercial model of the owner, various options for saturating business centers with related services are possible. Such services include catering establishments, household services, health and shopping, and entertainment. The location in the central part of the city allows one to fully use the space of the business center for a particular set of functions, because related services can be provided by the relevant enter-

prises located nearby. These business centers are defined as non-autonomous. However, sometimes, even in conditions of a developed service infrastructure in the immediate vicinity, it is commercially attractive to concentrate most of the related services in one building or complex of a business center. When the business center is in the peripheral parts of cities, this solution is the most acceptable for creating a high level of comfort of the business center. These business centers are defined as autonomous. Examples are as follows: autonomous buildings—the ASPARA, Almaty; and non-autonomous buildings—the MARDEN, Astana.

THE DIFFERENTIATION OF BUSINESS CENTERS BY INFRASTRUCTURE SELF-SUFFICIENCY		
№№	*an Example*	*a Picture*
1	*2*	*3*
1	**Autonomous buildings:** the "ASPARA", Almaty	
2	**Non-autonomous buildings:** the "MARDEN", Astana	

Figure 14. The differentiation of business centers by infrastructure self-sufficiency: (**1**) the ASPARA, Almaty [126]; and (**2**) the MARDEN, Astana [127].

A significant indicator is the **difference in the spatial solution** (examples are shown in Figure 15): stand alone; attached; built in; and mixed. Both in the field of new construction and in the field of reconstruction or profiling, there are business centers that are detached, attached or built in. The centers occupying the entire building are classified as freestanding. Built-in business centers usually occupy the first, less often with the second or even third floor of buildings. In most cases, these are residential buildings, both single and included in the complex. Less common are built-in business centers that occupy the entire end of the building. Rarely, a built-in business center occupies only the middle part of the building, several middle or upper floors. Attached business centers are available either in the variant of multistory extensions to the blind end of the building of one building or in the form of a corner insert between the blind ends. Embedded-attached business centers are usually an extension from the main body of the building on the levels that occupy the built-in premises. Sometimes such centers are a one-, two- or three-story podium at one or more buildings, usually of a tower type. Examples are as follows: stand-alone buildings—the NAURYZ, Rudny; attached buildings—the DIPLOMAT, Kokshetau; built-in buildings—the AITEKE, Almaty; built-in-attached buildings—the SILK WAY, Astana.

An isolated or grouped solution of business center buildings determines their **differentiation by completeness** (examples are shown in Figure 16): single and complex. The complexity of business centers is defined as a combination of several buildings linked to each other by planning, providing a different range of services for tenants. These buildings can have the same or different number of stories, and they include a planning connection in the form of one or more common floors at different heights. Single business centers are freestanding buildings, the functioning of which is concentrated entirely inside them. Examples are as follows: single-function business centers—the MARZHAN, Astana; and comprehensive business centers—the Q, Astana.

THE DIFFERENTIATION OF BUSINESS CENTERS BY SPATIAL SOLUTION		
№№	*an Example*	*a Picture*
1	*2*	*3*
1	**Stand-alone buildings:** the "NAURYZ", Rudny	
2	**Attached buildings:** the "DIPLOMAT", Kokshetau	
3	**Built-in buildings:** the "AITEKE", Almaty	
4	**Built-in-attached buildings:** the "SILK WAY", Astana	

Figure 15. The differentiation of business centers by spatial solution: (**1**) the NAURYZ, Rudnyi [128]; (**2**) the DIPLOMAT, Kokshetau [129]; (**3**) the AITEKE, Almaty [130]; and (**4**) the SILK WAY, Astana [131].

THE DIFFERENTIATION OF BUSINESS CENTERS BY COMPLEXITY		
№№	*an Example*	*a Picture*
1	*2*	*3*
1	**Single-function business centers:** the "MARZHAN", Astana	
2	**Comprehensive business centers:** the "Q", Astana	

Figure 16. The differentiation of business centers by complexity: (**1**) the MARZHAN, Astana [132]; and (**2**) the Q, Astana [133].

The specifics of the multidirectional dynamics of demand in the market of services provided by business centers determine their **differences in operating time** (examples are shown in Figure 17): permanent and temporary (one time, episodic, periodic). Most of the modern business centers in Kazakhstan can be classified as permanent, given the relative

long-term duration of their work, even given the periodically carried-out alterations in them and given the demand for a particular range of services. In rare cases, business centers stopped their work and were converted into buildings for other purposes. This happened, for example, with some kindergarten buildings, which in the 1990s were converted into business centers and by the mid 2000s were again turned into kindergartens. Indicative are business centers focused on exhibition activities. Some of them conduct one-time, periodic and episodic trade and exhibition events on a permanent basis, using all available areas. At the same time, in the intervals between these events, a small amount of office space is constantly operated. There are examples of the formation of business centers for one-time exhibition events with the subsequent repurposing or reconstruction of them according to the prevailing market conditions. There is also such a phenomenon as one-time, periodically or episodically emerging business centers in rented premises of buildings that have a different main function. An example is the holding of trade and exhibition (fair) events in sports complexes, in the arenas of which modular cells for offices and trade demonstration models are usually mounted. At the same time, all the related infrastructure of the building is involved (wardrobes, bathrooms, buffets, etc.). Examples are as follows: constantly working business centers—the ATAKENT, Almaty; and temporary (one-time, episodic, periodic) business centers—the EXPO-2017, Astana.

THE DIFFERENTIATION OF BUSINESS CENTERS BY OPERATING TIME

№№	*an Example*	*a Picture*
1	*2*	*3*
1	**Constantly working business centers:** the “ATAKENT”, Almaty	
2	**Temporary (one-time, episodic, periodic) business centers:** the “EXPO-2017”, Astana	

Figure 17. The differentiation of business centers by operating time: (**1**) the ATAKENT, Almaty [134]; and (**2**) the EXPO-2017, Astana [135].

Regardless of the capital of the buildings, it is possible to divide business centers **according to their position in space** (examples are shown in Figure 18): stationary and moving. If stationary business centers are characterized by both conventional capital construction and pre-erected temporary (usually long term), then the container solution is indicative for the vast majority of moving ones. Examples are as follows: stationary buildings—the modular business Center, Almaty; and moving buildings—the Mobile Container Business Center, Shimkent.

Another parameter is the **differentiation of business centers by variability** (examples are shown in Figure 19): stable and transformable (increasing, decreasing, rescheduling). Depending on the market conditions of services, business centers can occupy a constant or changing volume of the building. Depending on the commercial model of the lessor, one or another part of the building can be removed from the business center on a permanent or temporary basis both through repurposing and through reconstruction. The most clearly transformational possibilities are illustrated by container business centers, in which there is the possibility of relatively rapid changes in their capacity, both by increasing or decreasing the occupied territory and by increasing or decreasing the number of tiers. Examples

are as follows: stable buildings—the PARASAT, Shimkent; and transformable buildings (increasing, decreasing, changing the layout)—the Container Business Center, Karaganda.

THE DIFFERENTIATION OF BUSINESS CENTERS BY LOCATION IN SPACE		
№№	*an Example*	*a Picture*
1	*2*	*3*
1	**Stationary buildings:** the Modular business Center, Almaty	
2	**Moving buildings:** the Mobile Container Business Center, Shimkent	

Figure 18. The differentiation of business centers by location in space: (**1**) the Modular business Center, Almaty [136]; and (**2**) the Mobile Container Business Center, Shymkent [137].

THE DIFFERENTIATION OF BUSINESS CENTERS BY VARIABILITY		
№№	*an Example*	*a Picture*
1	*2*	*3*
1	**Stable buildings:** the "PARASAT", Shimkent	
2	**Transformable buildings (increasing, decreasing, changing the layout):** the Container Business Center, Karaganda	

Figure 19. The differentiation of business centers by variability: (**1**) the PARASAT, Shymkent [138]; and (**2**) the Container Business Center, Karaganda [139].

Naturally, business centers also **differ in layout** (examples are shown in Figure 20): corridor; enfilade; hall; atrium; gallery; and mixed. These types of layouts are based on the specifics of the work determined by the lessor. The most common is the corridor layout, which has become characteristic of the business centers of the initial stage of their development in Kazakhstan. It emerged from the opportunity formed by the end of the 1980s to lease to third-party organizations separate premises in existing research and design organizations; administrative and household buildings of industrial and transport enterprises; and cultural, educational other institutions. The basic function of these buildings implied the convenience of functioning with such a layout. It provided an opportunity for relatively free commercial maneuvering, in terms of both the size of the proposed premises and their location on different floors. This possibility also determines the predominant distribution of corridor planning in business centers.

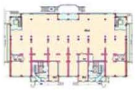
THE DIFFERENTIATION OF BUSINESS CENTERS BY LAYOUT		
№№	*an Example*	*a Picture*
1	*2*	*3*
1	**With the Corridor layout:** the "CITY LAKE", Astana	
2	**With the Enfilade layout:** the "ESENTAI TOWER", Almaty	
3	**With the Hall layout:** the "GARANT", Shimkent	
4	**With the atrium layout:** the "CONGRESS OFFICE", Astana	
5	**With the Gallery layout:** the Block-modular office (from the company "ElMedia Group"), Almaty	
6	**With the Combined layout:** the "NURSAULET", Astana	

Figure 20. The differentiation of business centers by layout: (**1**) the CITY LAKE, Astana [140]; (**2**) the ESENTAI TOWER, Almaty [98]; (**3**) the GARANT, Shimkent [141]; (**4**) the CONGRESS OFFICE, Astana [102]; (**5**) the Block-modular office (from the company ElMedia Group), Almaty [142]; and (**6**) the NURSAULET, Astana [143].

Enfilade layout is typical mainly for low-rise buildings in which tenants are trade and exhibition organizations. Sometimes it is also used in multistory buildings, but this requires a developed system of elevators and escalators on both ends of the suite. It is typical mainly for repurposed buildings of industrial and warehouse enterprises and is often reproduced in new buildings, implying the provision of trade and exhibition and warehouse services. This layout provides an opportunity for a consistent, scenario-organized demonstration of goods and services as the visitor passes through the suite of rooms. The hall layout is not "tied" to the number of stories of the building, because the developed system of elevators and escalators, such as in the central part, allows potential customers to be delivered to the center of the hall on each floor for its free orientation in choosing the route of acquaintance with the goods and services offered. In addition, if the length of the enfilade layout is practically unlimited (evacuation stairwells are located in the right amount in accordance with fire-fighting requirements), then there are technological restrictions on the area in the hall layout that are related, on the one hand, to ensuring the convenience of familiarization with the assortment directly at the exit of the elevator or the exit from the escalator and, on the other, to normalized areas of premises from the point of view of fire compartments isolated by fire barriers. Accordingly, the interior layout can fully function only within one fire compartment. In the presence of several fire compartments, sequential movement through them forms an enfilade layout.

The atrium layout is essentially a combination of a corridor and a hall, because a visitor from a staircase/elevator hall enters a wide corridor with a single- or multilight solution,

on the sides of which there are fully or partially isolated rooms offering a particular range of goods and services.

As for the gallery layout, one of the possible variants of the atrium layout with the arrangement of a multilight space on the one hand and a variety of rooms on the other can be considered as a type of gallery layout. In its "pure form", the gallery layout is practically not found in the capital construction of business centers in Kazakhstan. This is because, unlike residential buildings in public buildings, there is no strict regulation of the orientation of the windows of the premises to certain cardinal directions to ensure a normalized time of daily insolation. Accordingly, the design and construction of buildings with such a layout is not commercially attractive for business centers. The existing multistory residential buildings, such as in Almaty along Nazarbayev Ave, Abylai Khan Ave and Mametova Street, are not yet considered as objects of conversion into business centers. However, in the field of modular construction and the use of two- and three-tiered sea containers used for their intended purpose, such a layout is found. Here, an open gallery is attached either to containers that are usually blocked on the long side or a through internal passage is organized on one side.

The mixed type of layout demonstrates various combinations of corridor, enfilade, hall, atrium and sectional layouts, which are either an adaptation of the existing building to the specifics of the lessor's commercial plan, or its interpretation in a new building. Examples are as follows: with the corridor layout—the CITY LAKE, Astana; with the enfilade layout—the ESENTAI TOWER, Almaty; with the hall layout—the GARANT, Shimkent; with the atrium layout—the CONGRESS OFFICE, Astana; with the gallery layout—the Block-modular office (from the company ElMedia Group), Almaty; and with the combined layout—the NURSAULET, Astana.

The **difference in the architectural and artistic solution** (examples are shown in Figures 21 and 22) of business centers in Kazakhstan allows differentiating by style direction: neoclassical (orthodox version); neoclassical (simplified version); neoclassical (romantic version); national neoclassical; modernist; neo-modernist; neo-postmodern; neo-international; neoromantic; national romantic; deconstructivist; and brutalist.

The stylistic trends identified during the analysis are mostly in line with the trends that were identified on the basis of the analysis of the Kazakhstan's architecture of the turn of the century by one of the authors of this article [144–146]. The neoclassical direction is associated with various interpretations of symmetrical order compositions with one or another affinity with classical forms. The orthodox version implies a fairly accurate reproduction of the forms of classical orders, including almost the entire set with stylobates, pedestals, columns and entablatures themselves. To this are added the appropriate sandricks combined with window and door openings, solid or torn pediments and semi-frontons having a triangular or arc shape. Brackets are located under the eaves; developed archivolts, balustrades and arches are used. The romantic version implies the inclusion of order elements in the overall composition formed by deliberately massive or light large surfaces that do not have active plastics. At the same time, the general compositional solution of the object does not always have a symmetrical solution. The simplified version implies a clearly expressed symmetry of the composition and detailing from a limited set of simplified orthodox forms. The national-neoclassical direction is presented as a variant of the romantic version with the use of ornamental compositions and pointed arch inserts.

THE DIFFERENTIATION OF BUSINESS CENTERS BY ARCHITECTURAL-ARTISTIC SOLUTION (STYLE DIRECTIONS)			
№№	*an Example*	*a Number of buildings*	*a Picture*
1	*2*	*3*	*4*
1	**the Brutalist style direction:** the "THE OFFICE", Ural'sk	**157**	
2	**the Neo-international style direction:** the "ARAI PLAZA", Taraz	**95**	
3	**the Neo-romantic style direction:** the "AMBASADOR", Almaty	**48**	
4	**the Neo-classical style direction:** the Business Center on the Auezov Str., Almaty	**40**	
5	**the Neo-modernist style direction:** the "MIR", Aktobe	**37**	
6	**the Modernist style direction:** the "KAZAKHSTAN", Karaganda	**32**	

Figure 21. The differentiation of business centers by architectural-artistic solution (style directions): (**1**) the THE OFFICE, Ural'sk [147]; (**2**) the ARAI PLAZA, Taraz [148]; (**3**) the AMBASADOR, Almaty [149]; (**4**) the Business Center on the Auezov Str., Almaty [150]; (**5**) the MIR, Aktobe [151]; and (**6**) the KAZAKHSTAN, Karaganda [152].

The modernist trend is mostly represented by repurposed buildings built in the 1960s and 1980s, in the appearance of which the original plastic solution associated with the domestic interpretation of this trend at that time is preserved. The development of the ideas of modernism demonstrates the neo-modernist trend, which is already entirely related to modernity, developing the ideas of the primary source with active plasticity of large forms. The neo-postmodern trend develops relevant ideas that have been implemented in Kazakhstan since the early 1980s. They are connected both with various symbolic references to various historical styles, emphasizing regional specifics and the paradoxical nature of three-dimensional and plastic combinations. Interestingly, there is practically no high-tech among these options, although some solutions of supports and fasteners of developed transparent visors or plastic of large stained-glass windows demonstrate elements of this style direction that are not dominant in the overall plastic solution. The neointernational direction fruitfully develops the ideas of the international style that appeared in Kazakhstan in the 1960s. Buildings that are not related to regional climatic conditions or to the historical

and cultural context demonstrate combinations of large blind and glazed surfaces that are different in compositional complexity, devoid of fine detailing.

THE DIFFERENTIATION OF BUSINESS CENTERS BY ARCHITECTURAL-ARTISTIC SOLUTION (STYLE DIRECTIONS)			
№№	*an Example*	*a Number of buildings*	*a Picture*
1	*2*	*3*	*4*
7	**the Deconstructivist style direction:** the "BAKYT-TOWER", Ust'-Kamenogorsk	**16**	
8	**the Neo-classical style direction (a romantic version):** the "TOLE BI", Almaty	**13**	
9	**the Neo-romantic style direction:** the "ASIA", Astana	**11**	
10	**the Neo-classical style direction (an orthodox version):** the "ALMATY RESIDENCE", Almaty	**11**	
11	**the National-romantic style direction:** the "ALMA", Almaty	**6**	
12	**the National-neoclassic style direction:** the "GLOBUS", Almaty	**2**	

Figure 22. The differentiation of business centers by architectural-artistic solution (style directions): (**7**) the BAKYT-TOWER, Ust'-Kamenogorsk [153]; (**8**) the TOLE BI, Almaty [154]; (**9**) the AZIA, Astana [155]; (**10**) the ALMATY RESIDENCE, Almaty [99]; (**11**) the ALMA, Almaty [156]; and (**12**) the GLOBUS, Almaty [157].

The neoromantic direction demonstrates examples of appeal to various both historically developed plastic and compositional solutions and demonstrates peculiar combinations of fantasy forms. At the same time, the national-romantic solution adds to this approach various ornamental compositions in terms of saturation with elements. The deconstructivist trend retains the basic features of shaping, which has become popular since the 1990s. Compositions of varying degrees of complexity, plastic and color activity demonstrate initially difficult to perceive combinations of details and volumes. The brutalist

direction demonstrates, for the most part, a purely utilitarian approach to plastic solutions, the predominant sameness of window openings, the simplicity of solving canopies over entrances, etc. The direction is characteristic of all from the point of view of the origin of object types.

The architectural and artistic solution of the facades of the buildings under consideration, for the most part, does not depend on the history of the origin of the object, in that almost all the identified stylistic trends are found both in repurposed and reconstructed business centers and in newly built business centers. The exceptions are as follows: modernism, peculiar only to repurposed objects and found in the neomodernist interpretation in new buildings or reconstructed, as well as a romantic version of the neoclassical direction, which historically arose already in the modern period. In general, repurposed objects are interesting in this aspect because they retain the basic architectural and artistic solution associated with the appearance that existed at the time of the change in their function. Of the surveyed array, the most common are the brutalist (157 objects—THE OFFICE, Ural'sk, for example) and the neo-international (95 objects—the ARAI PLAZA, Taraz, for example) directions. They are almost twice as common as neoromantic (48 objects—the AMBASADOR, Almaty, for example), the neoclassical in a simplified version (40 objects—the Business Center on the Auezov Street, Almaty, for example), the neomodernist (37 objects—the MIR, Aktobe, for example) and the modernist (32 objects—the KAZAKHSTAN, Karaganda, for example) directions. The deconstructivist (16 objects—the BAKYT-TOWER, Ust'-Kamenogorsk, for example), the neoclassical in the romantic version (13 objects—the TOLE BI, Almaty, for example), the neoromantic (11 objects—the ASIA, Astana, for example) and the neoclassical in the orthodox version (11 objects—the ALMATY RESIDENCE, Almaty, for example) directions are still half as common. The least common are the national-romantic (6 objects—the ALMA, Almaty, for example) and the national-neoclassical (two objects—the GLOBUS, Almaty, for example) directions.

3. Results

To analyze the situation, data on cities of the Republic of Kazakhstan with a population of more than 100.000 people were used. According to the authors, this level of population is conditionally the lower threshold for the presence of clearly recorded competing business activity in various fields of entrepreneurship. The main data, the saturation of the cities of Kazakhstan with business centers, are shown in Figure 23. On the basis of the criterion of a population of 100.000 or more people [158], 21 cities were allocated: Astana, Almaty, Shymkent, Aktobe, Karaganda, Taraz, Pavlodar, Ust'-Kamenogorsk, Semey, Atyrau, Kostanay, Kyzylorda, Ural'sk, Petropavlovsk, Aktau, Temirtau, Turkestan, Taldykorgan, Kokshetau, Ekibastuz and Rudnyi. On the basis of the summation of data from various sources (links are shown later by the text for each location) and their own research, the authors determined the number of business centers operating in these cities.

The following figures turned up: the total population in the selected settlements is 8,559,405 people; the number of business centers is 832. The largest number of business centers in Almaty is 216; the smallest number of business centers in Ekibastuz is 8. However, the number of people does not directly determine the number of business centers. To clarify this position, the number of business centers is compared with the population by the parameter "number of people per business center". Accordingly, one business center accounts for an average of 10.300 people of the urban population. At the same time, the greatest saturation of the city with business centers is allocated in Aktau (3000 people per business center), and the smallest in Aktobe (22.000 people per business center). Interestingly, the saturation of business centers in the cities of Astana, Almaty, Atyrau, Petropavlovsk and Ekibastuz is almost the same, despite the sharply different number of population and administrative and economic status. The difference in this status is clearly read in the cities of Astana and Shymkent, which are close in population, differing in the number of business centers by more than two times. Moreover, in Shymkent, the saturation index (19.100 people per business center) is one of the lowest in Kazakhstan.

№	*Cities of Kazakhstan with a population of more than 100 thousand people*	*The population of the city (people)*	*The Number of business centers (pieces)*	*The Number of thousands of people per business center*
1	*2*	*3*	*4*	*5*
1	ASTANA	1 078 384	130	8.3
2	**ALMATY**	**1 854 656**	**216**	8.6
3	SHYMKENT	1 011 511	53	19.1
4	**AKTOBE**	**500 000**	22	**22.7**
5	KARAGANDA	497 767	47	9.7
6	TARAZ	357 528	22	16.2
7	PAVLODAR	333 818	15	22.2
8	UST'-KAMENOGORSK	331 597	25	13.2
9	SEMEY	323 199	25	12.9
10	ATYRAU	269 704	31	8.7
11	KOSTANAY	242 997	25	9.7
12	KYZYLORDA	239 042	25	9.6
13	URAL'SK	234 167	22	10.6
14	PETROPAVLOVSK	218 056	25	8.7
15	**AKTAU**	**183 006**	61	**3.0**
16	TEMIRTAU	179 234	23	7.8
17	TURKESTAN	164 963	10	16.4
18	TALDYKORGAN	145 365	25	5.8
19	KOKSHETAU	145 156	10	14.5
20	**EKIBASTUZ**	**133 942**	**8**	16.6
21	RUDNYI	115 313	14	8.2
	in total	***8559405***	***832***	***10.3***

Figure 23. The saturation of Kazakhstan's cities with business centers (number of population [158], number of business centers [https://2gis.kz/.../gallery/firm/; https://yandex.kz/maps/etc., accessed on 9 October 2022]).

The array of modern business centers surveyed by the authors in 21 cities of Kazakhstan in the amount of 468 units can be structured as shown in Figure 24: differentiation of characteristic business centers of Kazakhstan. Redesigned business centers are represented in the number of 74 (15.8%); reconstructed business centers are represented in the number of 110 (23.5%); and new business centers are represented in the number of 284 (60.7%). That is, most of the modern business centers of Kazakhstan are in new buildings, specially built for this function. Among the repurposed buildings, 46 are detached, 23 attached and 5 built in. At the same time, there are 10 low-rise buildings, 54 medium-rise buildings and 10 multistory buildings. Among the reconstructed buildings, 62 are detached, 38 attached and 10 built in. At the same time, there are 22 low-rise buildings, 66 medium-rise buildings and 12 multistory buildings. Among the new buildings, 224 are detached, 45 attached and 15 built in. At the same time, there are 50 low-rise buildings, 143 medium-rise buildings and 91 multistory buildings. That is, for the repurposed and reconstructed buildings of business centers, almost two–thirds are detached, approximately one-fifth are attached and one-tenth are built in. For new buildings, almost 80% are detached, 15% are attached and 5% are built in. In terms of number of floors, most business centers are medium-rise buildings. There are 73% of such buildings in repurposed business centers, 60% in reconstructed ones and more than 50% in new buildings. New buildings also have the largest percentage of multistory buildings.

BUSINESS CENTERS OF KAZAKHSTAN CHARACTERISTIC DIFFERENTIATION								
468 objects								
Repurposed buildings			**Reconstructed buildings**			**New buildings**		
74 (15.8%)			**110 (23.5%)**			**284 (60.7%)**		
Detached business centers	Attached business centers	Built-in business centers	Detached business centers	Attached business centers	Built-in business centers	Detached business centers	Attached business centers	Built-in business centers
46	23	5	62	38	10	224	45	15
Low–rise buildings	Medium–rise buildings	Multi–storey buildings	Low–rise buildings	Medium–rise buildings	Multi–storey buildings	Low–rise buildings	Medium–rise buildings	Multi–storey buildings
10	54	10	28	66	16	50	143	91

Figure 24. Business centers of Kazakhstan, by characteristic differentiation.

For groups of individual cities of Kazakhstan, these ratios look as follows. The Figure 25 shows the differentiation of the characteristic business centers of Astana and Almaty. A total of 295 business centers were surveyed in these two largest cities of the country. Of these, 47 (15.9%) are repurposed, 60 (20.3%) are reconstructed and 188 (63.8%) are new. Among the repurposed buildings, there are 25 detached (53.2%), 19 attached (40.4%) and 3 built in (6.4%). At the same time, there are 3 low-rise buildings (6.4%), 38 medium-rise buildings (80.8%) and 6 multistory buildings (12.8%). Among the reconstructed buildings, 33 (55.0%) are detached, 22 (33.6%) are attached and 5 (8.3%) are built in. At the same time, there are 7 low-rise buildings (11.7%), 43 medium-rise buildings (71.6%) and 10 multistory buildings (16.7%). Among the new buildings, 150 (79.8%) are detached, 28 (14.9%) are attached and 10 (5.3%) are built in. At the same time, there are 31 low-rise buildings (16.5%), 90 medium-rise buildings (47.9%) and 67 multistory buildings (35.6%).

The Figure 26 shows the differentiation of typical business centers of Shymkent, Aktobe, Karaganda, Taraz, Pavlodar, Ust'-Kamenogorsk, Semey, Atyrau, Kostanay, Kyzylorda, Ural'sk, Petropavlovsk, Aktau, Temirtau, Turkestan, Taldykorgan, Kokshetau, Ekibastuz and Rudny. A total of 173 business centers were surveyed in these cities of Kazakhstan. Of these, 27 (15.6%) are repurposed, 50 (28.9%) are reconstructed, 96 (55.5%) are new. Among the repurposed buildings, there are 21 detached (77.8%), 4 attached (14.8%), 2 built in (7.4%). At the same time, there are 7 low-rise buildings (25.9%), 16 medium-rise buildings (59.3%), 4 multistory buildings (14.8%). Among the reconstructed buildings, 29 (58.0%) are detached, 16 (32.0%) are attached, 5 (10.0%) are built in. At the same time, there are 15 low-rise buildings (30.0%), 33 medium-rise buildings (66.0%), 2 high-rise buildings (4.0%). Among new buildings, 74 (77.1%) are detached, 17 (17.7%) are attached, 5 (5.2%) are built in. At the same time, there are 19 low-rise buildings (19.8%), 53 medium-rise buildings (55.2%), 24 multistory buildings (25.0%).

TYPICAL BUSINESS CENTERS OF ASTANA AND ALMATY								
295 objects								
Repurposed buildings			**Reconstructed buildings**			**New buildings**		
47 (15.9%)			**60 (20.3%)**			**188 (63.8%)**		
Detached business centers	Attached business centers	Built-in business centers	Detached business centers	Attached business centers	Built-in business centers	Detached business centers	Attached business centers	Built-in business centers
25 53.2%	19 40.4%	3 6.4%	33 55.0%	22 36.7%	5 8.3%	150 79.8%	28 14.9%	10 5.3%
Low–rise buildings	Medium–rise buildings	Multi–storey buildings	Low–rise buildings	Medium–rise buildings	Multi–storey buildings	Low–rise buildings	Medium–rise buildings	Multi–storey buildings
3 6.4%	38 80.8%	6 12.8%	7 11.7%	43 71.6%	10 16.7%	31 16.5%	90 47.9%	67 35.6%

Figure 25. The differentiation of the characteristic business centers of Astana and Almaty.

TYPICAL BUSINESS CENTERS OF SHYMKENT, AKTOBE, KARAGANDA, TARAZ, PAVLODAR, UST'-KAMENOGORSK, SEMEI, ATYRAU, KOSTANAI, KZYLORDA, URAL'SK, PETROPAVLOVSK, AKTAU, TEMIRTAU, TURKESTAN, TALDYKORGAN, KOKSHETAU, EKIBASTUZ AND RUDNYI								
173 objects								
Repurposed buildings			**Reconstructed buildings**			**New buildings**		
27 (15.6%)			**50 (28.9%)**			**96 (55.5%)**		
Detached business centers	Attached business centers	Built-in business centers	Detached business centers	Attached business centers	Built-in business centers	Detached business centers	Attached business centers	Built-in business centers
21 77.8%	4 14.8%	2 7.4%	29 58.0%	16 32.0%	5 10.0%	74 77.1%	17 17.7%	5 5.2%
Low–rise buildings	Medium–rise buildings	Multi–storey buildings	Low–rise buildings	Medium–rise buildings	Multi–storey buildings	Low–rise buildings	Medium–rise buildings	Multi–storey buildings
7 25.9%	16 59.3%	4 14.8%	15 30.0%	33 66.0%	2 4.0%	19 19.8%	53 55.2%	24 25.0%

Figure 26. The differentiation of typical business centers of Shymkent, Aktobe, Karaganda, Taraz, Pavlodar, Ust'-Kamenogorsk, Semey, Atyrau, Kostanay, Kyzylorda, Ural'sk, Petropavlovsk, Aktau, Temirtau, Turkestan, Taldykorgan, Kokshetau, Ekibastuz, and Rudnyi.

Thus, the ratio of repurposed, reconstructed and new business centers is quite close to the cities of the country. However, there are fewer reconstructed business centers in Astana and Almaty than in other cities, and there are more new buildings. Among the repurposed buildings, the ratio between detached and attached buildings in Astana and Almaty is close, and in other cities, there are an overwhelming majority of detached buildings. At the same time, the ratio of built-in business centers to the total number is close. For reconstructed and new business centers, the ratios between detached, attached and built-in business centers are quite close in various cities of Kazakhstan. As for the number of floors, in the repurposed buildings in Astana and Almaty, the vast majority are occupied by medium-rise buildings. In other cities, they are also the majority, but slightly more than half in size. Medium-rise buildings also prevail among reconstructed and new buildings. However, among the reconstructed buildings, their smaller ratio is noted in Astana and Almaty, while in other cities, it is almost one-third. Among new buildings, the ratio of buildings by number of stories is relatively close in various cities of Kazakhstan.

4. Discussion

The rapid spread of COVID-19, which began in 2020, led to significant changes in the work of business centers. In the beginning, in order to preserve health by reducing direct communication at work and in transport, the vast majority of employees were transferred to remote-work mode. This led to the emptying of the working premises, the termination of the work of related services (food and rest of employees, cleaning of premises, technical and technological support, etc.). Some business centers have simply closed. In them, the minimum number of security personnel and engineering and technical support for the functioning of the building remained.

On the one hand, this has led to a reduction in energy costs for the operation of the building by reducing the costs of lighting workplaces, ensuring the operation of personal computers, ventilation and air conditioning in the premises, water supply and the sewerage of public toilets. Financial expenses for maintenance personnel have been reduced. On the other hand, the rent for unused premises remained.

During the first six months of such work, it seemed that business centers, as a typologically independent type of building, would cease to exist at all, because almost all work and technologically necessary communication could be conducted in “remote mode”. In some cases, it turned out that employees perform a given amount of work much faster while out of the office. They have more free time to communicate with family and friends and for recreation, entertainment and self-improvement. However, it quickly became clear that only “online communication” with colleagues, partners and clients has some critical drawbacks.

The most significant problem was the inability to ensure the confidentiality of work. A personal computer operating outside the office is difficult to completely protect from unfriendly Internet penetration. The room itself, in which an employee works “remotely”, is also vulnerable from the point of view of audiovisual control. As a result, such issues of interest to competitors as the form of organization of the company’s work with employees and clients, the volume and subject of transactions, the order portfolio, the customer base, development prospects, applied organizational and technological solutions, work features and the qualification skills of individual employees have become much more easily accessible. This created the prospect of a partial loss of competitive advantage.

Another problem was the complication of ensuring the rhythmic work of employees and the operational redistribution of responsibilities. Working “remotely”, the specialist determines the time convenient for them to perform a particular operation. In addition, this does not always coincide with the previously fixed workday in the office. As a result, the synchronicity of the team’s work is disrupted, which in some areas of activity is critically unacceptable. Difficulties also arose with providing “remotely” working employees with personal computers of the necessary capacity and configuration with the appropriate equipment of a “remote workplace”, usually at the place of residence.

As a result, as the success in the fight against the pandemic increased, most of the employees were gradually returned to their normal mode and place of work in offices. However, the structural and spatial organization of business centers has partially changed. The work performed was clearly divided as far as possible, and the expediency of their execution in the "offline" or "online" modes was affected. This made it possible to reduce the number of employees working directly in the office. The vacated areas were either excluded from the rented premises or used to place workplaces at an optimal distance from each other from the point of view of the sanitary and epidemiological situation. This distance turned out to be greater than before. Accordingly, the capacity of the premises decreased. This has become especially noticeable in large rooms, decided on the basis of the concept of "open space". However, in enterprises where it turned out to be impossible to reduce the number of office employees, there was a problem with the need to increase the amount of occupied space. The "cabinet scheme" of employee placement has become predominant.

In the conditions of expediency of observing the optimal social distance, the problem of filling elevator cabins arises. Now, instead of five to eight people, only two to three people can optimally fit in the elevator. This makes it difficult to move between floors, increasing the waiting time for the elevator. This is critical at the beginning and end of the workday, as a queue naturally forms. At the same time, maintaining an optimal social distance leads to the need to increase elevator halls. Part of the problem can be solved by increasing the number of elevators. However, this will require large capital investments for reconstruction. Some of the workers can use stairs, but this is only possible in low-rise buildings. Another way to partially solve this problem is to change the work schedule of employees. This applies to the start and end times of the workday and to lunch breaks. However, this may be inconvenient from the point of view of the administration of the enterprise. When several companies are located in the building, it is practically difficult to implement. "Personal cocoons" have become much more frequently used. If earlier it was a kind of "exotic" used for partial audiovisual isolation, now the function of aeration isolation has been added to this. This led to the need for the appropriate improvement and development of ventilation systems.

The system of organizing the public catering and recreation of employees during the workday was also changed. The need to observe the "social distance" has led to the abolition of almost one-time breaks for eating and rest. The layout of cafes and halls has changed accordingly, as has the arrangement of furniture in them. The sharply increased popularity of online commerce and the delivery of small items directly to the consumer has led to the need for the redevelopment of business centers, including operational warehouses of goods and stores. The area of such warehouses has increased significantly, and the number of stores has decreased. The number of business centers with such a composition of premises has increased.

The emerging trend toward reducing the need for office space has set the task of completely or partially repurposing the existing buildings of business centers. Low-rise buildings remain quite competitive, as there is an opportunity to expand the area of shops and restaurants in the most comfortable floors: from the consumer's point of view, the first two floors.

An interesting trend is the attempt to use the vacated premises for the organization of coworking. At the same time, it is possible to ensure compliance with a safe social distance. In addition, the number of working contacts and the time of joint stay of people in the same room is reduced. This becomes possible in the process of the spread of intelligent technologies, such as in a "smart city". These technologies generally lead to a gradual change in the functioning of most urban spaces and premises inside buildings, for various purposes. The ability to order and deliver various goods reduces the need for retail space in stores. The corresponding transformations are being acquired by public catering enterprises. The need for enterprises for daily fast food is decreasing. Only restaurants for occasional visits remain in demand. As a result, a large number of areas are being released in cities

that need to be used in some way. This problem is becoming more and more urgent. The study of this trend is still in the initial stage—at the level of fixing the phenomenon.

An attempt by planning means to increase the number of warehouses in multistory buildings, but it turns out to be unpromising because warehouses have a much greater load on the floors than the premises for the administration of transactions. This will require reinforcing columns and beams. In addition, it is required to change the elevators with their conversion from passenger to cargo and passenger. It is necessary to increase the width of the corridors, taking into account the work of loading and unloading mechanisms.

There may be an attempt to convert multistory buildings into medical institutions. However, replacing the elevators will be required, given the possibility of transporting the patient on a stretcher. It will be completely necessary to redo the ventilation system.

Multistory buildings can be converted into hotels, apartments and flats. This practice existed earlier: the Reliance Building in Chicago in 1999 was converted into a hotel; since the 2010s, office premises after the expiration of the lease have been bought with the prospect of turning the building into a hotel in the Flatiron Building in New York; in the early 2000s, floors 11 to 30 were converted into residential buildings in the Park Row Building; and by 2020, the transformation into the Tribune Tower residential building in Chicago was completed. At the end of 2022, a nine-story business center on Dostyk Ave, 172 in Almaty began to be reconstructed into a hotel. The success of these redevelopment measures is ensured by the optimal floor height for residential premises. In addition, the corresponding transformation of engineering networks of power supply, water supply and sewerage has no technical difficulties.

Now these events can become massive. Moreover, if there are practically no planning restrictions for hotels and rented apartments, then there is a nuance for ordinary apartments. The fact is that, for example, in Kazakhstan, there is a requirement to provide direct sunlight to at least one living room in an apartment for 2.5 h a day. Accordingly, there is a problem with the orientation of the building according to the countries of the world. However, a compromise is possible here. Zones with a favorable orientation can be occupied by flats, and apartments for rent can be located outside these zones. At the same time, the usual presence of two stairwells and a developed elevator node in the former business center allows for the independent functioning of both parts of the building with new functional content. For example, in the business center Almaty Residence, apartments are located only on the fourth and partially fifth floors and can be made on 3, 6, 7, 8 and 9. There are two-, three- and four-room apartments. This example is shown in Figure 27.

In the business center Almaty House-Building Plant, there are no planning problems at all, because it functions on the basis of the construction of a nine-story large-panel residential building. In the Talan Towers in Astana, the second 30-story tower can, if necessary, be converted into a hotel and residences, as it is now in the neighboring 25-story tower. In the Esentai Tower in Almaty, part of the floors is occupied by a hotel and apartments. Accordingly, this planning solution can be transferred to the floors currently operated as offices (the layouts of these buildings with their original purpose are shown in Figures 7 and 8, which were given earlier).

The only problem that arises when converting business centers into residential buildings is the lack of a sufficient yard size, the presence and size of which are determined by state regulations. However, it is possible to increase the number of courtyards by forming open spaces on one or more floors—analogs of this solution are the Mirador Building, Madrid (arch. Blanca Lleó, MVRDV, 2005); the Celosía Building, Madrid (arch. Blanca Lleó, MVRDV, 2008); and Future Towers, Pune (arch. MVRDV, 2018).

Figure 27. Business center redevelopment options—apartments (authors' drawings based on existing layouts [99]): the Almaty Residence, Almaty.

Possible options for the redevelopment of such business centers as the Almaty Towers in Almaty (four apartments on the floor), the Nursaulet in Astana (four apartments on the floor), the Seven in Astana (four apartments on the floor) and the City Kostanay in Kostanay (six apartments on the floor) are shown in Figure 28. Possible options for the redevelopment of such business centers as the Almaty Towers in Almaty (eight hotel suites on the floor), the Nursaulet in Astana (26 hotel suites on the floor), the Seven in Astana (9 hotel suites on the floor) and the City Kostanay in Kostanay (15 hotel suites on the floor) in hotels are shown in Figure 29.

There are also no problems with the accessibility of new residents to public transport and shops. Multistory buildings in business centers are in areas with a high level of urban infrastructure development and that feature landscaping for the adjacent space.

If we consider the price issue, then according to the data analyzed by the authors of this article, the portals for the sale of real estate in Almaty (www.olx.kz. . . , www.krisha.kz. . . , www.dom.kz. . . accessed on 15 December 2022.) show that the average monthly rental price of offices and apartments is almost the same, namely $ 10.0 per m^2, and the average selling price of offices and apartments is almost the same, namely 1500.0 per m^2. However, the problem is that the demand for renting or buying offices is very small, whereas the demand for renting or buying apartments is consistently high. Accordingly, the owners of office buildings and premises are constantly increasing losses. Reducing the prices for renting and selling offices does not solve the problem due to lack of demand. Moreover, the recovery of demand for office space is not even predicted yet. In the post-COVID-19 period, the demand for renting office space by the hour has increased significantly. The price is $ 0.5 per m^2. However, this is a very small and specific part of the office real estate market. That is, in most cases, the optimal solution is to redevelop the premises in office buildings to use them as rented or sold apartments. Redevelopment, according to approximate calculations, will cost (without finishing) about $ 75.0 per m^2 (part of the cost of exclusive finishing can be borne by the buyer). On average, it will cost the same amount

to redevelop in order to create a hotel (in this case, it is necessary to take into account all additional finishing costs). However, the occupancy rate of hotels is uneven by season and is 55% (on average per year). This in most cases does not allow the owner of the property to form an optimal business plan for the functioning of the hotel.

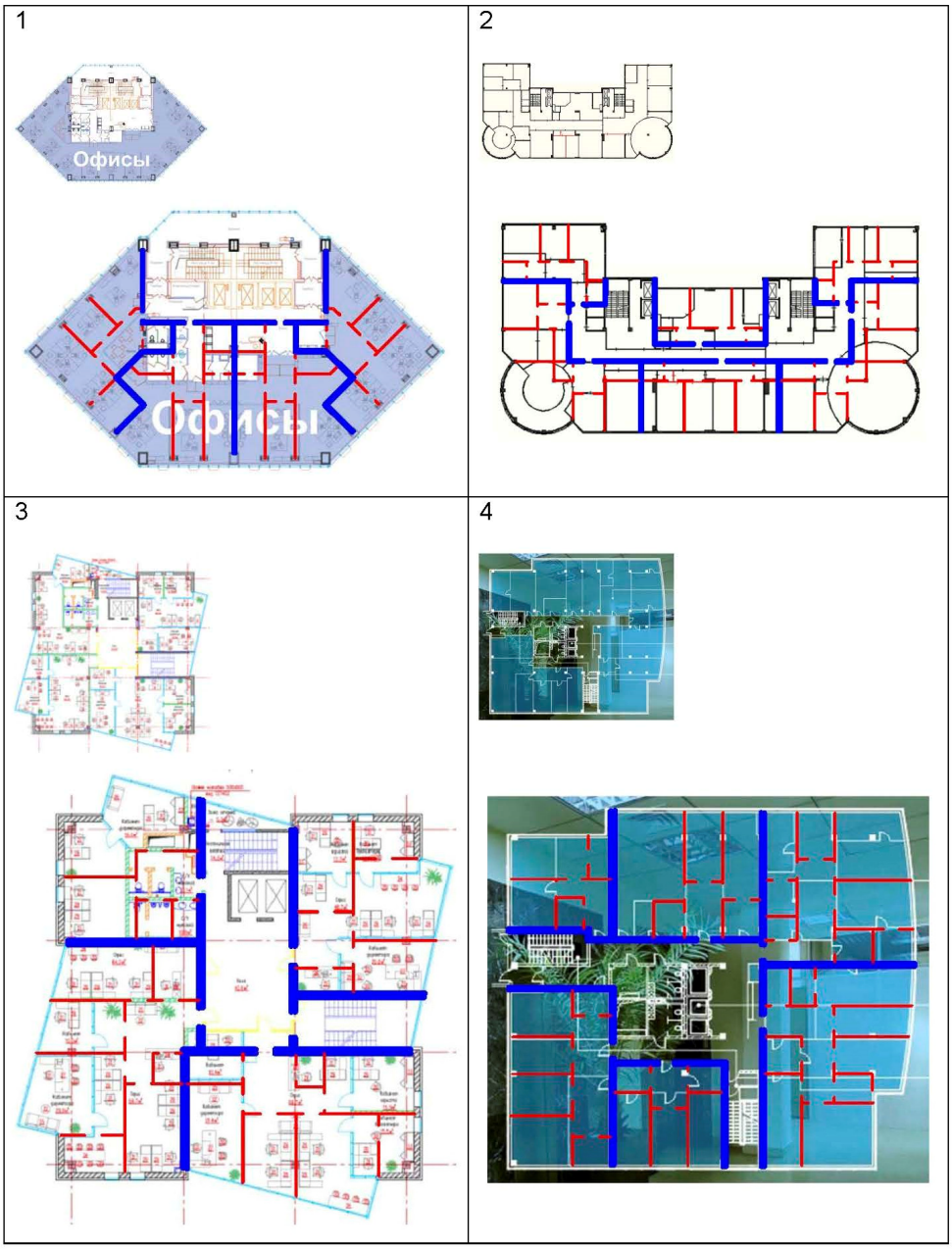


Figure 28. Business center redevelopment options—apartments (authors' drawings based on existing layouts [97,125,159,160]): (**1**) the Almaty Towers, Almaty; (**2**) the Nursaulet, Astana; (**3**) the Seven, Astana; and (**4**) the City Kostanay, Kostanay.

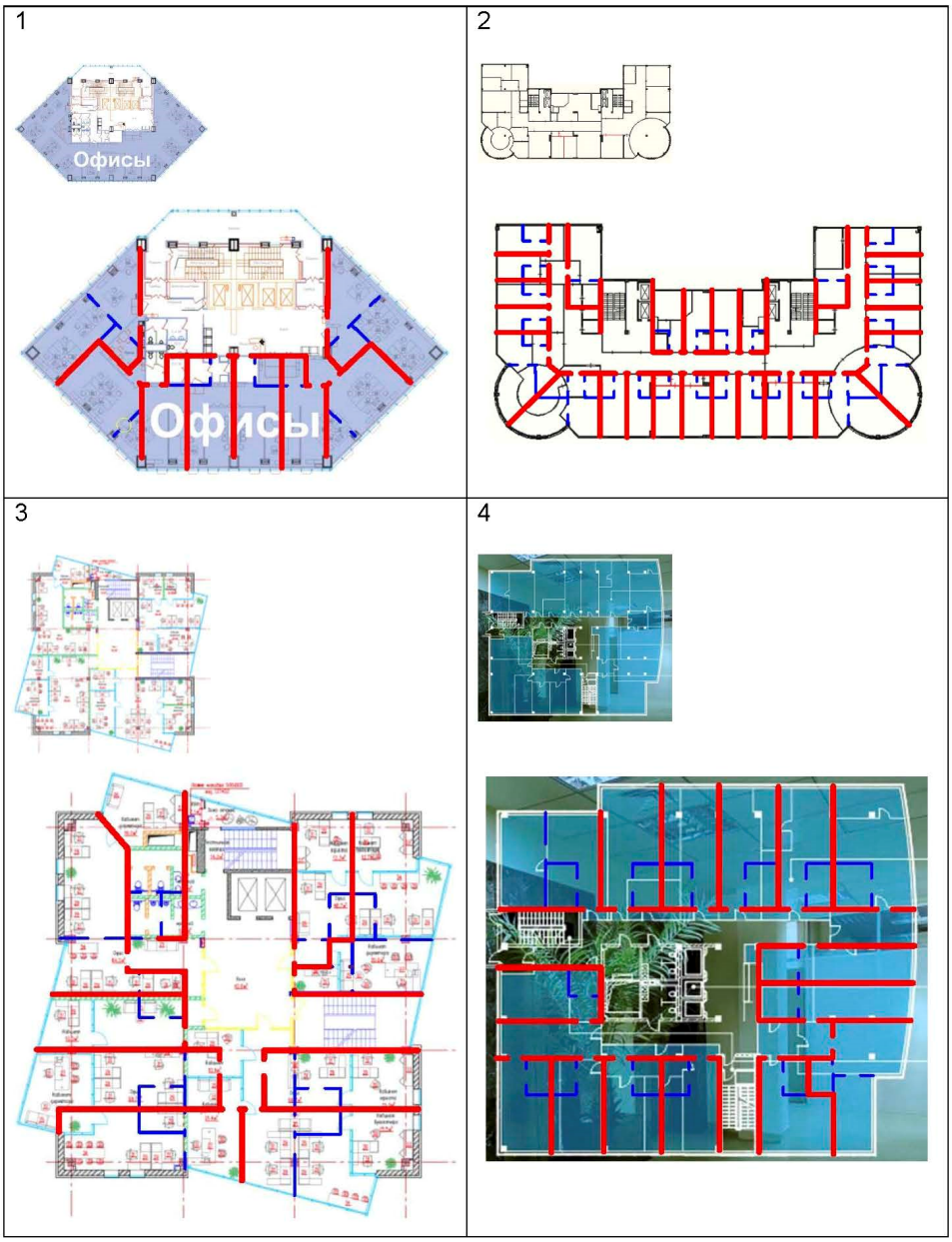


Figure 29. Business center redevelopment options—hotels (authors' drawings based on existing layouts [97,125,159,160]): (**1**) the Almaty Towers, Almaty; (**2**) the Nursaulet, Astana; (**3**) the Seven, Astana; and (**4**) the City Kostanay, Kostanay.

An interesting option for repurposing multistory business centers is their use as educational and administrative buildings of higher educational institutions. However, it is necessary to increase the number of elevators. The use of these buildings for student dormitories also looks promising. In this case, the layout may be similar to that of a hotel.

The upper floors of high-rise buildings can be used to organize various attractions with observation decks and restaurants (as it successfully works, for example, in the Edge, Observation Deck at the 30 Hudson Yards, and in the Summit One Vanderbilt in New York). Thus, in each specific case, it is possible to find the optimal solution that allows one to repurpose the building.

In the context of the struggle to reduce the negative impact on the climate, carrying out measures for the reconstruction of existing business centers naturally allows for achieving higher energy efficiency indicators for buildings through the use of more-advanced

technologies and used construction and finishing materials than before. A number of business centers in Kazakhstan have international BREEAM and LEED certificates (e.g., Talan Towers and B11 in Astana, Park-View Office Tower and BNC PLAZA and PRIME Business Park in Almaty). Accordingly, with their possible re-profiling, it is possible to only partially improve the indicators. In most other cases, when noncertified buildings are repurposed, very high rates can be achieved. It is possible to install rotary-type wind generators on the roof of reconstructed buildings. On the eastern, southern and western facades, it is possible to generate energy from solar panels—the piers between the windows and the window sills can be used. The insulation of exterior walls and the use of heat-protective glasses will reduce the heat transfer of surfaces. Collecting rainwater and using it for irrigation dramatically reduces costs in this area. An additional opportunity to reduce water consumption is the reuse of wastewater from baths and sinks for the sewerage of toilets. For finishing, the use of recycled materials is promising. The complex of these and other works in the field of "green building" is naturally included in the scope of reconstruction activities. Accordingly, because of the planned reconstruction, a significant number of buildings will begin to meet environmental standards, expanding the scope of sustainable development.

5. Conclusions

The post-COVID-19 situation, after the pandemic affected all types of activities, had the most significant impact on the spaces where masses of people stay. One of the types of such spaces is business centers. The specifics of their work, associated with the proximity of employees throughout the workday, have become a critical factor in the fight against the spread of the disease. There was a need to solve this problem by administrative, organizational, technological, architectural and planning means. These events are naturally based on the typological specifics of business centers.

The development of business centers providing trade and intermediary activities has a long history, during which they have evolved from spontaneously arising, almost undeveloped sites to large complexes of buildings and structures, including diverse systems of related services. The regional features of this process in Kazakhstan are determined by several parameters that vary from one period to another.

Thus, a characteristic historical feature of the development of business centers in Kazakhstan is that the relatively low level of development of trade and intermediary activity at the turn of the most recent century and the century before it was adequately reflected by low-rise family trading houses with a small set of rented premises. The socioeconomic specifics of the country's development in the middle of the most recent century did not imply the presence of such a typological unit as a business center in the building. By the end of the most recently century until the beginning of this century, the need for business centers in Kazakhstan has appeared again. Accordingly, a large number of administrative, educational, scientific and industrial buildings that ceased to function according to their original purpose turned out to be in commercial circulation. They, being repurposed and reconstructed, have become an essential part of the now successfully functioning fund of business centers. Some of them were occupied by large corporations, having carried out significant reconstruction activities. However, the vast majority with minimal planning and facade alterations are massively used to provide long-term or short-term leases to small and medium-size businesses.

The polycentricity of the location on the territory of the country and the dynamism of the centers of business activity, combined with changes in the intensity and structure of trade turnover, led to the intensive construction of new business centers in certain regions of the Republic (Astana, Aktau, Almaty, Atyrau, Shymkent). At the same time, in other regions, most of the business centers are in repurposed or reconstructed buildings. In general, the study showed the presence of regional in general and subregional in particular specifics of business centers in Kazakhstan.

In post-COVID-19 conditions, most business centers in Kazakhstan have become much less in demand in the commercial real estate market. This was especially true for multistory

buildings. One of the ways to attract buyers and tenants is the conversion of multistory business centers into residential buildings or hotels. Other, though hardly acceptable, ways to adapt business centers are to increase the number of elevators, increase the number of stairwells or expand staircases. The dispersed placement of employees in the "open space" system leads to the need to increase the occupied space. The transition to the "cabinet" location of employees looks more adequate. All these aspects have a significant effects on the prospects of designing new buildings of business centers. It is essential that in the process of the reconstruction of existing business centers in order to repurpose them, it is possible to achieve a much higher compliance of these buildings with the standards of "green building".

The conducted research has prospects for continuation and deepening. They are connected with the expediency of a more detailed study of the planning features of individual business centers, according to an analysis of the transformation of their layouts during operation. More complete coverage of business centers by specific cities is of interest. Of course, it is necessary to investigate newly constructed or reconstructed buildings appearing in Kazakhstan. This is especially true in the situation of changing demand for premises rented for business centers, which was formed as a result of post-COVID-19 transformations.

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