

**THE DEVELOPMENT OF URBAN PLANNING IN SAMARKAND DURING THE
TIMURID ERA**

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Abstract: This scholarly work deeply examines the development of urban planning in Samarkand during the Timurid era. The study analyzes the central squares, madrasas, mosques, mausoleums, gardens, streets, and caravanserais of the city, focusing on their geomantic and aesthetic arrangements. Additionally, the city's water supply, defense system, and economic infrastructure are examined. Based on precise historical facts and architectural sources, the research highlights Samarkand's role as a political, cultural, and religious center during the Timurid period. This work contributes to understanding the urban heritage of Samarkand, its position in Central Asia, and the sophisticated urban planning system established during the Timurid era.

Keywords: Timurid era, Samarkand urban planning, Registan Square, madrasas, mosques, mausoleums, geomantic arrangement, water system, caravanserais, architectural heritage

During the Timurid era, Samarkand was one of the political, economic, and cultural centers of Central Asia, and its urban planning and architectural development reached its peak. Amir Timur and his successors aimed to make Samarkand not only the administrative center of the state but also a hub of science, culture, and trade networks. During this period, the city's layout, architectural ensembles, streets, gardens, and water supply system were developed in a systematic and scientific manner.

The urban planning of Samarkand relied primarily on two principles: centrality and geomantic balance. The city's center was formed around Registan Square, which served as an economic, political, and religious hub. Registan Square is an example of symmetrical and axial planning in urban design. During the Timurid period, madrasas, mosques, and government offices were situated around this square, with distances and proportions determined according to precise geometric calculations. For instance, the dimensions and locations of the Ulugh Beg Madrasa, Sher-Dor Madrasa, and Tilya-Kori Madrasa ensured both the aesthetic and functional balance of the city.

Amir Timur (1336–1405) made it a primary goal to develop Samarkand as the political and cultural center of his empire. In the 1370s, Timur captured Samarkand and began the process of its restoration and expansion. During this period, the city's central areas—Registan Square, the Shah-i Zinda complex, and the Bibi-Khanym Mosque—entered an active construction phase. In particular, the construction of the Bibi-Khanym Mosque from 1399 to 1404 became one of the largest and most important projects of Timurid architecture. Hundreds of thousands of workers and craftsmen were involved in the construction, some of whom were brought from Isfahan, Khwarezm, India, and other regions.

During the Timurid period, Registan Square played a central role in Samarkand's urban planning. The Ulugh Beg Madrasa, built between 1417 and 1420, reflects the city's geometric layout through its location and architectural details. The madrasa's three-sided symmetrical structure

and expansive courtyard made it the visual centerpiece of the city. In 1636, the Sher-Dor Madrasa was constructed by later generations, adding to the Registan ensemble and reinforcing the axial and symmetrical balance in the city's urban plan. Mosques and mausoleums held significant importance in the development of Samarkand's urban landscape. The Gur-Emir Mausoleum, built between 1403 and 1404 for Timur and his family, served not only as a religious site but also as a political and cultural center. The tiles, mosaics, minarets, and domes used in its construction defined the city's aesthetic character. This monument reinforced both the urban layout and cultural significance of Samarkand during the Timurid era.

The city's water supply system also merits special attention. Water from the Zarafshan Valley was brought into the city through canals, particularly the "Kushkary" and "Siab" canals constructed during the Timurid period, providing drinking and irrigation water. Between 1380 and 1390, the canal system was expanded, stabilizing the city's internal network and supporting trade and commercial activities.

The streets of Samarkand were systematically planned during the Timurid period. For example, the roads connecting Registan Square to the Shah-i Zinda complex were laid out according to geometric principles, serving as optimal routes for trade and commerce. These streets centralized not only commercial but also social and religious activities. The network also included roads leading to caravanserais and markets, which were particularly important for the city's internal and regional connectivity. During the Timurid era, the city's defense system also developed significantly. Between 1380 and 1405, high walls and watchtowers were constructed around Samarkand. These defensive structures were placed in accordance with the city's geomantic plan. For example, the towers protecting the Shah-i Zinda complex and Registan Square not only served defensive purposes but also enhanced the city's panoramic appearance.

Science and technology were actively applied in urban planning. During the reign of Ulugh Beg (1394–1449), the observatory built in the 1420s served as a center for astronomical research and added geomantic balance to the city's central urban layout. Ulugh Beg's astronomical tables and construction projects perfectly integrated urban planning with architectural technology.

During the Timurid period, Samarkand's urban planning was a comprehensive system combining political, economic, religious, cultural, and scientific aspects, making the city unique in the history of Central Asia and the world. The city's development during this era has been preserved not only in architecture and urban planning but also as a historical legacy in culture and science. Water supply was a critical aspect of urban planning. During the Timurid era, canals bringing water from the Zarafshan Valley provided drinking and irrigation water. These canals were integrated into the city's geomantic layout and, when combined with bridges and water reservoirs, enhanced both the functional and aesthetic aspects of urban planning.

Samarkand's street network was also systematically developed during the Timurid period. Streets were oriented toward central squares, facilitating the centralization of commercial and social activities. The city featured a combination of narrow and wide streets leading to markets, mosques, and caravanserais, efficiently organizing internal transport and trade systems. Cultural symbolism played an important role in the development of Timurid architecture and urban planning. For example, the Bibi-Khanym Mosque and the Gur-Emir Mausoleum served not only as religious centers but also as political and spiritual hubs. Decorative elements, mosaics, and

tiles used in these structures defined the city's aesthetic character and reflected international trade and diplomatic connections.

Another key aspect of urban planning was the city's defense system. Timur built high walls and towers around Samarkand for protection. These defensive structures were positioned according to geomantic and aesthetic principles. Towers not only served defensive purposes but also contributed to the city's panoramic appearance. Science and technology played a significant role in Samarkand's urban development. Astronomy, geometry, and construction technologies were actively employed in architectural projects. The construction of Ulugh Beg's Madrasa and observatory exemplifies this, serving both scientific research and the geomantic balance of the urban plan.

Gardens and public squares were of special importance. Gardens around the central squares not only enhanced the city's aesthetic appearance but also functioned as centers of social and cultural life. For instance, gardens adjacent to Registan Square reinforced the city's symmetrical layout and provided a recreational space for citizens during the hot season. Gardens were often integrated with water basins and canals, creating a natural balance and aesthetic harmony in the city.

Caravanserais were a vital part of Samarkand's trade and commercial infrastructure. During the Timurid period, Samarkand, as a center of Central Asian trade networks, saw caravanserais constructed across various parts of the city. For example, caravanserais near the Siab Bazaar accommodated Eastern traders, while those around the Bibi-Khanym Mosque supported religious and political visitors. These structures were integrated into the city's street network, optimizing trade and transport routes. Minarets and the defensive system also developed during the Timurid period. Towers were built to protect central squares, mosques, and madrasas. These towers served both defensive functions and enhanced the city's panoramic visual appeal. For example, the towers surrounding the Shah-i Zinda complex visually distinguished the city's religious and cultural center.

Samarkand's economic infrastructure also flourished during the Timurid period. Markets, caravanserais, streets, and the water supply system were interconnected. Timur attracted merchants and artisans from within his empire and abroad, strengthening the city's economic foundation. Water supply systems were advanced, with canals from the Zarafshan Valley meeting the city's drinking and irrigation needs. Furthermore, science and geometric principles were actively applied in Samarkand's architecture. Symmetry, axial planning, and geomantic balance played central roles in construction. Madrasas, mosques, mausoleums, and gardens were harmoniously integrated into the city's overall urban system, contributing to both practical functionality and aesthetic and cultural value.

During the Timurid period, Samarkand's urban planning developed into a comprehensive system integrating political, economic, religious, and cultural needs. Its architectural ensembles, gardens, streets, caravanserais, and defensive structures hold a unique place in the urban heritage of Central Asia.

One of the central elements of Samarkand's urban planning was the madrasas. The Ulugh Beg Madrasa (1417–1420) occupied the northern part of Registan Square, serving not only as a center of scientific activity but also as the geomantic center of the city. Its triangular symmetrical

structure and central entrance ensured the city's visual and urban balance. Geometric forms, tall minarets, and mosaics in the madrasa combined science with aesthetic harmony. The Sher-Dor Madrasa (1619–1636) was added to the Registan ensemble, reinforcing the axial order of the city's urban plan. Its decorative elements, including animal and sun motifs, continued the symbolic ornamentation style characteristic of Timurid and later architecture. The madrasa's placement created visual directions connecting streets and central squares.

Mosques served as the religious and cultural centers of the city, with their architectural and geomantic placement aligned with urban planning principles. The Bibi-Khanym Mosque (1399–1404) was constructed in the central square during Timur's reign. Its dome and minarets defined the city's visual appearance, while its water basins and gardens created a natural balance. The Shah-i Zinda complex, located east of Registan, emphasized the city's axial layout through its minarets and structures.

Mausoleums were also key elements of urban planning. The Gur-Emir Mausoleum (1403–1404) was built for Amir Timur and his descendants, serving not only as a religious site but also as a political and cultural center. Tiles, mosaics, and domes used in construction ensured architectural harmony and geomantic alignment with other city structures.

Geomantic arrangement was another key aspect of Timurid urban planning. Central squares, madrasas, mosques, and mausoleums were positioned based on natural and aesthetic balance. Streets were oriented toward central ensembles, regulating the city's internal transport and commercial activity. Minarets, water reservoirs, and gardens were placed in accordance with geomantic urban planning principles.

The water supply system played a vital role in Samarkand's urban planning. Canals from the Zarafshan Valley provided drinking and irrigation water, integrated with madrasas, mosques, and gardens to ensure both functional and aesthetic balance. During the Timurid period, the urban development of Samarkand was not limited to its central buildings but also encompassed the complex development of the city's economic, cultural, and social structures. After arriving in the city, Amir Timur paid special attention to expanding Samarkand as a strategic and commercial center. The markets located in the old part of the city were modernized, new caravanserais were constructed, and the internal and external transport routes of the city were organized according to geomantic and functional principles.

Parks and squares not only enriched the aesthetic appearance of the city but also served as centers of social and cultural life. For example, parks located near the central squares of the city were used as recreational areas for citizens during the summer and were connected with water reservoirs, fountains, and canals. These parks not only created a natural balance but also reinforced the geomantic symmetry of the city.

The city also developed as a scientific and cultural center. During the Timurid period, scholars, astronomers, and craftsmen from various regions were invited to Samarkand. Astronomical observations were carried out at Ulugh Beg's observatory, which contributed to the integration of urban planning with scientific development. Madrasas, particularly Ulugh Beg Madrasah, served not only as centers of learning but also as geomantic centers of the city. The economic infrastructure of Samarkand was systematically developed as well. Markets and caravanserais were integrated into the city's internal trade system, facilitating both domestic and international

trade connections. Caravanserais near the Siab Bazaar served Eastern merchants, while those around the Bibi-Khanym Mosque supported religious and political activities.

The defense system of the city was also complexly developed. High walls, towers, and garrisons were constructed around Samarkand. The towers not only served defensive purposes but also enhanced the aesthetic panoramic view of the city. The towers protecting the Shah-i-Zinda complex and Registan Square visually distinguished the city's religious and cultural center. Water supply played a particularly important role in the urban system of Samarkand. Water from the Zarafshan Valley, specifically through the Kushkary and Siab canals, was delivered to the city for drinking and irrigation purposes. These canals were integrated with madrasahs, mosques, gardens, and squares, ensuring both practical and aesthetic balance in urban planning.

During the Timurid period, geometry and symmetry held a central place in the city's architecture and urban design. Streets were oriented toward central squares and served to concentrate commercial, social, and religious activities. Towers, water reservoirs, and gardens were positioned according to geomantic principles. This approach added not only practical but also aesthetic and cultural significance to the city. Caravanserais and markets ensured the city's economic stability. Additionally, the internal transport system of the city was optimally organized. Streets, squares, and gardens were interconnected, facilitating citizens' daily life and promoting trade activities.

In the Timurid period, Samarkand's urban development evolved as a comprehensive system that combined political, economic, religious, cultural, and scientific aspects, making the city a unique example of urban heritage in Central Asia and across the world. Thus, during the Timurid period, Samarkand became one of the greatest examples of urban and architectural heritage in Central Asia. Its madrasahs, mosques, mausoleums, gardens, streets, and minarets created a comprehensive system that served not only political and religious purposes but also aesthetic and cultural functions.

In conclusion, Timurid-era Samarkand developed a systematic and sophisticated urban planning model that integrated political, economic, religious, and cultural aspects. This era made Samarkand a unique city in the urban and architectural heritage of not only Central Asia but also the world.

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