

## Article

# Sustainable Development of the Infrastructure of the City of Astana Since the Establishment of the Capital as a Factor of Tourism Development

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**Abstract:** The underdevelopment of tourism infrastructure remains a critical barrier to the growth of the tourism sector in both the capital and regional areas. This article examines the concept and structure of tourism infrastructure, synthesizes methodological approaches for its evaluation, and identifies the strengths and limitations of these approaches. The study introduces a novel methodology for assessing the development of tourism infrastructure in the capital city. Based on the assessment, the city's regions are categorized into four levels of infrastructure development: high, above average, average, and below average. The findings highlight the key factors driving tourism development and the obstacles limiting infrastructure progress, while also proposing strategic directions for its enhancement. Achieving optimal levels of infrastructure provision is identified as a crucial condition for advancing the tourism sector. The development of tourism infrastructure should be prioritized in regional economic policy. In line with the state's "Concept for the Development of the Tourism Industry of the Republic of Kazakhstan for 2023–2029", this study emphasizes the need for a streamlined and precise classification of tourism infrastructure components based on a comprehensive framework. The evaluation is conducted using an integrated indicator that captures the development level of key elements: accommodation infrastructure, international event venues, and access to leisure and entertainment. Additionally, the article provides a comparative analysis of the current state of tourism infrastructure relative to the early stages of the capital's development and tracks the dynamics of tourism indicators from 2010 to 2024. Several interrelated challenges affecting infrastructure growth have been identified. Notably, the study reveals that hosting international events and forums has significantly boosted inbound tourism compared to regional averages in Kazakhstan, although it has also constrained the potential for tourism business growth in other regions. The practical insights derived from this study offer a comprehensive understanding of the state of tourism infrastructure in Astana, which can inform future research and policy development for tourism infrastructure in major urban areas.

**Keywords:** tourism infrastructure; urban infrastructure; tourism development challenges; Astana; tourism potential



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## 1. Introduction

In recent years, there has been a noticeable increase in the number of studies in the academic literature addressing the current state and development of tourism infrastruc-

ture [1–4]. Under contemporary conditions, tourism is recognized as one of the promising and priority sectors for regional socio-economic development, not only in cities and regions but for the country as a whole [5–7]. The importance of infrastructure for tourism development was highlighted by the President of Kazakhstan, Kassym-Jomart Tokayev, in his annual address to the people of Kazakhstan, where the third priority—“STRATEGIC INVESTMENTS IN THE FUTURE OF THE COUNTRY”—states that “The development of infrastructure at key tourist sites must be a focal point of attention. . .” [8].

In the current economic reality, the creation of modern and competitive tourism infrastructure is crucial for the development of international, domestic, and inbound tourism in Kazakhstan [9]. Furthermore, the projected 20% growth in domestic tourism by 2025 [10] underscores the urgency of addressing infrastructural challenges, including poorly developed, and in some regions entirely absent, supporting infrastructure, as well as the low level of development in tourism infrastructure facilities.

The objective of the study was to ascertain the level of tourist attractiveness and the factors that contribute to it, to evaluate the extent of infrastructure development in Astana, and to identify the challenges facing the city’s tourism infrastructure.

In order to achieve this objective, the following tasks have been identified and formulated, which will be addressed.

What is the current level of tourist attractiveness of the city of Astana. The principal factors influencing the city’s tourist appeal have been identified. The current state and level of development of tourist infrastructure in Astana were demonstrated. The problematic issues and barriers that impede the development of tourist infrastructure in the city were identified. It was revealed how local residents and tourists assess the tourist attractiveness of the city. The article demonstrated which natural, cultural, and historical resources of the city are the most attractive for tourists. It also demonstrated the level of digitalization and availability of information about tourist facilities and services in the city.

These issues are being addressed through public–private partnership mechanisms within the framework of establishing special economic zones of a tourism-recreational type, along with the implementation of state and regional programs aimed at tourism development [10,11].

When considering the challenges and prospects of tourism infrastructure development at both theoretical and practical levels, it is important to address the issue of the ambiguous interpretation of this concept. Terms such as “tourism infrastructure”, “tourist infrastructure”, and “regional tourism infrastructure” are frequently used in regulatory, strategic, and program management documents, as well as in the academic and specialized literature on tourism [12–14].

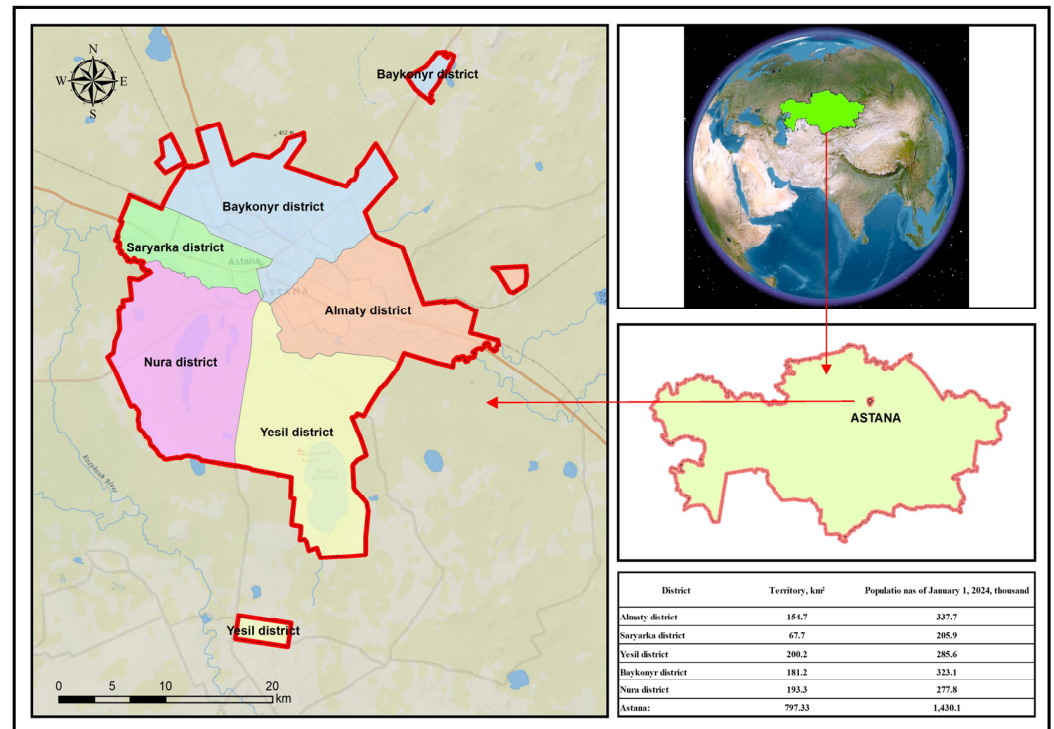
The complexity and evolving nature of the term “infrastructure” in the tourism sector are attributed to changing approaches to defining tourism itself, which has become a complex and multifaceted field. The modern tourism services market is shaped and transformed by geopolitical, environmental, economic, scientific-technical, and socio-cultural factors, expanding and deepening the process of service production for tourists. According to researchers and experts [15–17], at least 53 types of economic activities are involved in providing services to tourists.

However, the majority of studies tend to focus on specific regions, reflecting the distinct characteristics and effectiveness of tourism business development, the state of tourism infrastructure, and its individual components in tourism and border regions [18–21], as well as the influence of tourism infrastructure on regional tourism development [22,23]. Insufficient attention has been paid to a comprehensive approach to studying tourism infrastructure in capital cities. Comparative analyses of capital cities’ infrastructure development, aimed at forming a generalized understanding of the state and development levels of tourism infrastructure, remain underexplored in the academic literature.

The purpose of this study was to assess the level of tourism infrastructure development in the city of Astana to identify data and the problems with tourism infrastructure development.

## 2. Case Study Description

Astana, positioned at the geographic center of the Eurasian continent, is located in the southeastern part of the Akmola Region, within northern Central Kazakhstan. Serving as the capital of the Republic of Kazakhstan since 10 December 1997 [23], Astana plays a pivotal role in the nation's socio-economic and political landscape [24]. (See Figure 1).



**Figure 1.** Study area (own development in the ArcGIS10.8 program).

The geographical coordinates of the city are  $51^{\circ}08'00''$  north latitude and  $71^{\circ}26'00''$  east longitude. The study area spans  $797.33 \text{ km}^2$ , with the majority consisting of low mountain slopes and gently rolling plains at elevations ranging from 300 to 500 m [25]. Administratively, Astana is divided into five districts. The city is an enclave, surrounded by the territory of the Akmola Region, but it is not part of the region administratively. Astana is situated on a steppe plain, with its terrain characterized by low floodplain terraces. The lowest elevation, at 337 m above sea level, is found in the floodplain of the Yesil River.

Various approaches to defining tourism infrastructure can be found in the economic and specialized literature [1,3,6,12,16,18,26].

Tourism infrastructure is broadly defined as the ensemble of physical and organizational structures that support tourism activities [1,3]. Its primary components include the following:

**Transportation Infrastructure:** Airports, railways, and public transport systems ensuring connectivity.

**Accommodation Facilities:** Hotels, hostels, serviced apartments.

**Cultural and Recreational Spaces:** Museums, heritage sites, parks, and entertainment zones.

**ICT (Information and Communication Technology):** Platforms providing information and facilitating bookings [12].

The integration of smart technologies, such as augmented reality for navigation and automated hotel services, has redefined the concept of tourism infrastructure [16].

For instance, the implementation of smart technologies, including mobile apps, smart maps, augmented reality (AR) and virtual reality (VR) tours, and the use of big data to predict tourist flows, has been employed in Barcelona, which has been designated a smart

city [16]. A “smart city” is not merely a “people’s city”; it is a city that is human-centric. A “city for people” implies the convergence of technological, institutional, and personal dimensions, based on well-constructed political management. This allows for the reflection of the uniqueness of a geographical location, the specificity of historical and cultural development, and the consideration of the many other features that are particular to each city [17].

Research highlights a bidirectional relationship between urban development and tourism infrastructure:

**Economic Contributions:** Investment in tourism infrastructure often triggers economic growth by generating employment and increasing local revenue [18]. During the 20th century, Bangkok, the capital city of Thailand, evolved into the country’s primary hub for commercial and manufacturing activities. The city’s extensive infrastructure has facilitated a significant concentration of economic activity, which has accelerated further with the advent of globalization and technological advancement in the 21st century. This has led to a remarkable increase in the standard of living.

**Cultural Preservation:** Revitalization of historical sites and cultural spaces enhances both urban aesthetics and tourism appeal [19].

**Social Impacts:** Improved infrastructure benefits not only tourists but also residents, fostering urban inclusivity [19].

However, over-tourism and infrastructure strain in cities like Venice and Barcelona demonstrate the challenges of balancing growth and sustainability [20–23].

Scholars have developed various methods to assess urban tourism infrastructure:

**Quantitative Approaches:** Tourism Competitiveness Index (TCI): Evaluates infrastructure alongside other tourism-enabling factors [21].

**Accessibility Metrics:** Focus on the availability and connectivity of key infrastructure components.

**Qualitative Approaches:** Surveys and interviews to capture user experiences and satisfaction levels [22].

Case studies examining best practices in infrastructure development.

**Spatial Analysis:** Use of GISs (Geographic Information Systems) to map and evaluate the distribution of tourism facilities [18,22].

Substantial research has been conducted on the relationship between infrastructure and regional development [27]. Scholars from George Mason University (USA) emphasize the role of infrastructure in regional development as a crucial component of public policy [28]. Rohima underscores the importance of enhancing public infrastructure for territorial development [6].

Smart tourism has emerged as a critical area of focus in infrastructure studies. Key innovations include the following. **Digital Infrastructure:** Smart apps and platforms that improve tourist experience and infrastructure efficiency [28].

**Sustainable Urban Mobility:** Electric buses, bike-sharing systems, and pedestrian-friendly zones [6]. **Resilient Infrastructure:** Systems designed to withstand climate change impacts and urban pressures [27]. Smart tourism cities such as Seoul and Amsterdam exemplify the integration of advanced technologies into urban infrastructure planning.

Research on urban tourism infrastructure highlights its central role in shaping a city’s global competitiveness and local livability. While significant progress has been made, issues such as over-tourism, environmental degradation, and infrastructure inequality persist. Future studies should focus on integrating smart technologies, promoting sustainability, and fostering inclusive urban development.

### 3. Research Methods

This study is grounded in the methodological foundations established by domestic and international scholars who have investigated modern tourism and its infrastructure [2,5,9,23,26].

Depending on the research objectives, infrastructure is defined as a collection of enterprises that “create conditions to meet tourism needs” [18]; a complex of facilities

and networks that “enable the functioning of the tourism sector” [21]; or a system of objects and organizations that “provide all necessary conditions for offering a complete range of services (transfer, accommodation, catering, transportation services, etc.)”. In our view, these definitions are fundamentally aligned, as they all describe the means by which tourist needs are met, whether through enterprises, facilities, networks, or systems of organizations.

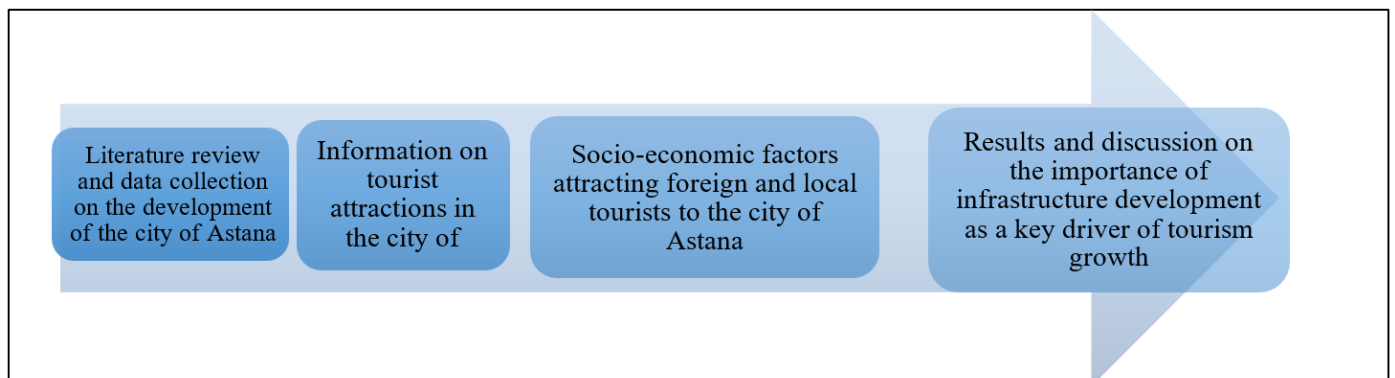
Infrastructure accessibility is analyzed using the tourism infrastructure indicator (the number of places in collective accommodation facilities), which provides a comprehensive assessment of the regional tourism market. This includes data on inbound and outbound foreign visitors.

The transportation accessibility of Astana is analyzed in terms of its rail and air connections with international and regional entities.

The research utilizes official statistical data from [29,30] on tourism development and infrastructure across regions, including data on the number of tourism companies, accommodation capacities, and the number of individuals staying in collective lodging facilities in Astana.

To evaluate the development level of tourism infrastructure across the city’s districts, various tourism infrastructure indices were calculated, including the Berete–Defert Index, Defert Index, Schneider Index, and the number of tourist accommodation places per square kilometer. The average values of these indices in European Union countries were used as a reference. This analysis enabled the assessment of tourism infrastructure development in Astana.

The study of the relationship between tourism infrastructure and the city’s development was conducted in four stages. The research methodology is presented in Figure 2.



**Figure 2.** Research methodology.

In order to achieve the objectives of the study and obtain objective data, a comprehensive approach was employed, encompassing both qualitative and quantitative methods of analysis. The research was aimed at studying the level of tourist attractiveness, the state of infrastructure, and identifying key problems in the development of tourism infrastructure in the city of Astana.

The study had several phases.

**Theory:**

A study of how tourism infrastructure affects the attractiveness of cities.

Analysis of Astana’s tourism development plans.

**Collecting data:**

Surveys of key people in the area (residents, tourists, experts).

Obtain statistics from official sources like the Kazakhstan Statistics Committee.

**Data analysis:**

Processing collected information using statistics and maps.

Finding out what makes a place attractive to tourists and how well it is maintained.

**Fieldwork:**

We inspected the city's main tourist attractions.

We looked at the state of the infrastructure: transport, accommodation, and public spaces.

**Statistical analysis:**

The questionnaire data were processed using descriptive statistics.

We looked at how tourist attractions and infrastructure are connected.

**Spatial analysis:**

Tourist facilities were mapped using GISs.

Looking at how much infrastructure there is in different parts of the city.

The integrated approach enabled the acquisition of comprehensive data on the state of tourism infrastructure in Astana. These data allowed for the identification of both the strengths and weaknesses of the infrastructure, and the formulation of recommendations for its further development.

*Research Results*

In the 13th century, the territory of Kazakhstan was part of the Mongol Empire under the rule of Genghis Khan. Following the collapse of the Golden Horde, the independent Kazakh Khanate was established in 1465. The Russian Empire began its expansion into the Kazakh steppe in the 18th century, and by the end of the 19th century, most of the Great Steppe, along with all of western Turkestan, had been incorporated into Russia. After the October Revolution of 1917 and the subsequent civil war, the region underwent several reorganizations. On 5 December 1936, with the adoption of the USSR's second constitution, the Kazakh ASSR, which had been part of the Russian SFSR, was transformed into the Kazakh Soviet Socialist Republic, directly becoming part of the Soviet Union [31].

On 10 December 1991, the name of the state was changed from "Kazakh Soviet Socialist Republic" to "Republic of Kazakhstan" [32]. Kazakhstan was the last of the Soviet republics to declare independence during the dissolution of the Soviet Union in December 1991 [33].

Throughout the 20th century, Kazakhstan's capital moved through several cities: Orenburg, Kyzyl-Orda, Almaty, and Astana. In 1997, the capital was transferred from Almaty to Astana. By decree of the President of Kazakhstan on 20 October 1997, Astana was officially declared the capital of the Republic of Kazakhstan [34]. The decision to relocate the capital was spearheaded by the first president of Kazakhstan, N.A. Nazarbayev.

The historical significance of Astana is tied to its establishment more than 200 years ago and, in modern times, its designation as the regional center for virgin and fallow lands during the late 1950s and early 1960s. The city's designation as the capital of a young, independent Kazakhstan has further solidified its importance.

The development of the city over the last two centuries has not been extensively documented in terms of urban planning and architecture. However, in 1816, a large Russian military–scientific expedition was sent to the Pri-Ishim steppes to explore and select sites for establishing command posts—bases for spreading Russian influence in Kazakhstan. In the spring of 1816, after consulting with local elders, Lieutenant Colonel F. Shubin made the pivotal decision to establish a military settlement on the high, flood-resistant right bank of the Ishim River, near the site of the ancient nomadic city of Bozok. This settlement was named Akmolinsk, after the Akmola Region. Starting in 1948, Akmolinsk began to shift from its military function to civilian development. In 1962, it was officially designated a city.

The late 19th and early 20th centuries marked a period of architectural flourishing for Akmolinsk. Buildings from this time, distinguished by their artistic value, are now considered monuments of architectural heritage. The homes of wealthy merchants, typically built with basements, exemplify the architecture of the time. Notable examples include the house of Merchant Kubrin (now the Ukrainian Embassy) and the house of Merchant Moiseyev (now a hospital for WWII veterans). It was also during this period that the city's first gardens and parks were established. In 1910, the position of city architect was

introduced for the first time, reflecting the city's serious approach to planning and shaping its architectural identity. This position was held by architect Adolf Denisovich Pavlov [35].

The development of virgin and fallow lands in the 1950s placed Akmolinsk at the center of this movement, triggering another construction boom and population growth. Between 1954 and 1960, the population grew from 77,000 to 129,000. In 1961, Akmolinsk was renamed Tselinograd and became the capital of the Virgin Lands region [36].

The city's urban plan divided the area into functional zones arranged in parallel strips: (1) industrial-storage and utility zone; (2) railway tracks; (3) residential zone; (4) park-recreational zone; (5) suburban agricultural zone. The plan took into account the terrain, hydrography, and natural climate conditions. For example, the industrial-storage zone was placed beyond the railway tracks on the windward side of the residential area, creating a buffer that protected residential zones from industrial pollution. The residential zone was separated from the Ishim River by a wide strip of parks, which not only served as a buffer to protect the river from urban runoff but also provided a recreational space for residents. The low-lying left bank of the Ishim River, prone to flooding but with fertile soils formed by centuries of alluvial deposits, was designated as a suburban agricultural zone to supply the city with fresh produce [31].

In the older parts of the city, the block-based urban grid was preserved where possible, with larger blocks and widened streets. In newer areas, the microdistrict concept, considered the most progressive at the time, was adopted. It was estimated that Tselinograd's population would grow to 380,000 by 1980.

The dissolution of the Virgin Lands region in 1964 and the subsequent reduction in Tselinograd's status to a regional administrative center led to decreased government funding, which affected city development plans and construction volumes. Despite this, the city continued to grow at a steady pace, progressively improving its urban structure and architectural landscape [36].

Housing construction in the 1970s–1980s differed from that of the 1960s. The later years of industrialized construction saw more professional project designs, improved apartment layouts, and more aesthetically pleasing building facades. The construction of 9–12 story buildings in the 1970s–1980s was used to highlight important urban nodes as vertical landmarks.

By 1990, Tselinograd's population reached 287,000. In 1991, the city entered a new era of development as part of the newly independent Republic of Kazakhstan. In 1992, the city regained its historical name, Akmola [36].

After the capital was moved to Akmola, the priority was to ensure uninterrupted water, electricity, and heating supplies. By decree of the President of Kazakhstan on 20 October 1997, the city of Astana was officially declared the capital of Kazakhstan [34].

The development of Astana can be divided into six distinct phases, each reflecting a certain sequence of growth.

Phase I—1997–1999: During this period, city development was guided by the master plan for the capital's development, designed by the Kazakhstani creative group "Ak Orda" for the period up to 2005. In a short time, buildings from former design institutes such as "Tselingiproselkhoz", "Tselingiproselproject", "Kazgiproselkhoz", and the municipal enterprise "Tselinenergo" were reconstructed and adapted for government use. Facades of old buildings were modernized in a national style. In 1998, the Presidential Cultural Center (now the Museum of the First President) was completed, along with the reconstruction of the Esil River embankment, bridge, and the high-tech cinema "Cinema City" and pedestrian-shopping gallery "Millennium". During this period, the five-star high-rise hotel "Intercontinental" (now "Ramada Plaza") was also built.

Phase II—2000–2001: During this period, development continued according to the master plan, designed by the "Dar Al-Handasah" project group composed of American, Arab, and European architects and officially approved by the Government of Kazakhstan. Construction companies from Switzerland, the UK, the Czech Republic, Turkey, and other countries actively participated in building modern high-rise structures (12–25 stories).

Phase III—2002–2005: To attract investments, President Nazarbayev signed a decree in February 2002 establishing the Free Economic Zone “Astana—New City” [37]. This led to a surge in domestic and foreign investments in construction. Private investments funded most projects, excluding social and public infrastructure. Noteworthy projects during this period included the “Duman” Oceanarium (2003), the new administrative center—the Water-Green Boulevard and “Bayterek” monument square—the new Presidential Residence “Akorda”, and several high-rise residential complexes, such as “Emerald Quarter”, “Northern Lights”, and “Triumph of Astana” (Figures 3–8). By 2005, 1.067 million square meters of housing had been constructed, and several old buildings on the right bank were demolished to make way for new schools, hospitals, and affordable housing.



Figure 3. Duman [37].



Figure 4. Bayterek [38].



Figure 5. Akorda [39].





**Figure 6.** Government of the Republic of Kazakhstan [40].



**Figure 7.** Emerald Quarter [41].



**Figure 8.** Northern Lights [42].

Phase IV—2006–2010: During this period, considerable attention was focused on improving the city’s infrastructure and adding smaller elements that contributed to its modern architectural look. Regulations prohibited the close proximity of residential buildings, and strict oversight ensured that parking facilities were incorporated under or near every building during construction.

Due to the rapid population growth and internal migration, there was an acute shortage of essential social infrastructure, such as schools, kindergartens, and hospitals. In re-

sponse, between 2006 and 2010, 110 kindergartens, 15 schools, 10 hospitals (with 1580 beds), as well as outpatient medical facilities and clinics, were built.

In celebration of the capital's anniversary on 6 July 2008, 33 major projects were completed. These included the “Kazakh Eli” monument (Figure 9), the Palace of Independence (Figure 10), the “Shabyt” Palace, and the “Astana Arena” stadium (Figure 11).



Figure 9. Monument [43].

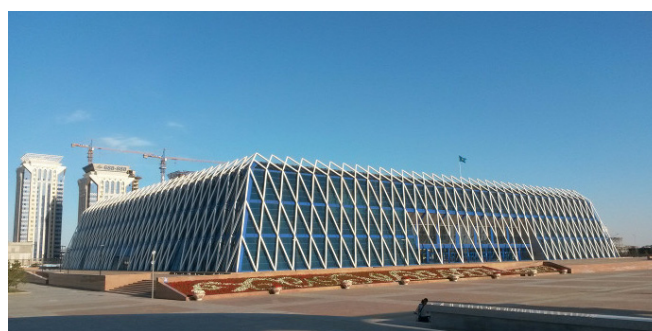


Figure 10. Palace of Independence [44].



Figure 11. Astana Arena Stadium [45].

Phase V—2011–2017: During this phase, significant attention was given to the urban development of the capital, the integration of the city with its suburban areas, and the expansion of transportation infrastructure. In recent years, Astana has experienced a demographic boom, which highlighted the growing need for housing, social infrastructure, roads, and utilities. During this period, several important structures were completed, including the Hazret Sultan Mosque (2012) (Figure 12), the Astana Opera (2013), and the National Museum (2014).



**Figure 12.** Mosque [46].

Additionally, preparations began for the International Specialized Exhibition “EXPO-2017”. As part of the city’s preparations, Astana’s transportation infrastructure underwent substantial upgrades. New streets and intersections were built, a special lane (“Bus Lane”) for public transport was introduced, and the construction of a 26 km Light Rail Transit (LRT) line, connecting the airport to the city center, commenced.

The central feature of EXPO-2017 was the spherical building “Nur Alem” (Kazakh: “Bright World”), which stood 100 m tall and 80 m in diameter. After the exhibition concluded, “Nur Alem” continued to operate as a museum. In the lead-up to EXPO-2017, the main railway station “Nurly Zhol” was also built, with a new capacity for 35,000 people, opening on 1 June 2017.

Phase VI—2017 to the Present: The current phase is focused on the pursuit of the “ideal city”. An ideal city, above all, should be a comfortable place to live for the majority of its residents. In response to the growing population density, Astana is increasingly prioritizing the development of well-planned and aesthetically pleasing public spaces. These spaces should be not only convenient for people but also sustainable, smart, safe, and vibrant. Astana is still striving to become the ideal city, and while it has made notable progress in a short period, the city is poised to find its unique path in the near future.

Thus, the history of Astana, beginning with the construction of the first steppe outpost of Akmola, spans over 180 years. Excavations of the ancient Bozok settlement, located in the western part of the current city, point to an even older history dating back a thousand years (8th–9th centuries). However, the most significant stages of Astana’s modern development are linked to its role as the center for the Virgin Lands program in the mid-20th century and its transformation into the new capital of independent Kazakhstan at the beginning of this century.

Currently, the city continues to support and develop efforts to preserve, restore, and recreate its immovable historical and cultural heritage, recognizing it as a crucial factor in urban development that influences all aspects of the city’s progress.

As of today, there are over 40 historical and cultural monuments in Astana that are under state protection, three of which hold national significance (Table 1). Each monument has designated protection zones and regulated construction zones [31].

The capital of the Republic of Kazakhstan, Astana, stands as one of the country’s primary cultural and tourist hubs. The city is home to a variety of cultural institutions, including concert halls, palaces, museums, theaters, libraries, a circus, cinemas, private art galleries, and parks for culture and leisure—key factors contributing to the growth of domestic tourism. Astana features 14 tranquil parks, covering more than 429 hectares. In 2021, the construction of an equestrian sports complex in the green belt area was completed. The new facility, known as the “Tourist Route” (a horseback trail within the green belt), has become one of the most popular destinations for both residents and visitors.

According to statistical data from local executive authorities [29], there has been an upward trend in domestic tourism flows.

The Table 2 presents data on the number of visitors (hotels, hostels, rented apartments) accommodated in Astana, focusing on the residents of the Republic of Kazakhstan. There has been a steady annual increase in domestic interest in visiting the capital, likely due to Astana's role as the economic and administrative center of Kazakhstan. The city attracts a large number of businesspeople and entrepreneurs, hosting important meetings, conferences, forums, and exhibitions. Many companies have their headquarters in the capital, making business trips to Astana an essential part of their operations. Additionally, the city offers more opportunities for education and career advancement, as it is home to leading universities, research institutes, and organizations that attract young people and professionals from various regions.

**Table 1.** Architectural and archeological monuments of national importance [31].



№	Monument Name	Figure	Year of Construction
	Old Muslim School		XIX century
	Bozok Settlement, Southwest of the City, Eastern Shore of Lake Buzukty		VIII–IX centuries
	Constantine and Helen Church		1854–1900
	Merchant's House		1846
	Merchant S. A. Kubrin's Hospital		1880

Table 1. Cont.




№	Monument Name	Figure	Year of Construction
	Muslim Cemetery “Qaraotkel”, Zhasstar District		1609–1962
	Memorial Museum Complex of Victims of Political Repressions and Totalitarianism “ALZHIR”		XX century
	Monument to A. S. Pushkin		1999

Table 2. The number of visitors served by accommodation facilities in the city of Astana (residents of the Republic of Kazakhstan) [29,30].

Years	Number of People (Thousands/Year)	Years	Number of People (Thousands/Year)
2004	86.963	2014	421.389
2005	87.474	2015	424.584
2006	107.915	2016	418.913
2007	127.973	2017	454.334
2008	127.685	2018	552.667
2009	87.192	2019	512.319
2010	88.612	2020	542.835
2011	109.050	2021	639.277
2012	112.313	2022	687.572
2013	129.872	2023	730.573

Astana is also renowned for its modern and unique architecture. Iconic landmarks such as the Bayterek Tower, the Palace of Peace and Reconciliation, and others draw tourists from across the country and the world. For regional tourists, it offers a chance to experience the vibrant symbols of modernity and innovative urban design.

#### 4. Discussion

The capital is a major venue for cultural events, including concerts, theater performances, festivals, and sports competitions. Its many museums, theaters, and galleries create a rich cultural atmosphere that local tourists find irresistible. Astana, as the capital and a key cultural center, plays a significant role in the spiritual development of its residents and the organization of recreational activities on a national scale.

In recent years (2019–2023), there has been notable growth in tourism, likely linked to the development of high-quality medical services. Astana is home to the best medical centers and hospitals, equipped with modern technology and staffed by highly qualified specialists. Many of these professionals were trained through the “Bolashak” program, initiated by the first president in 1993 [47]. This program has produced a generation of top professionals who have significantly contributed to the development of medicine and science.

Astana’s infrastructure, therefore, attracts visitors for business, cultural, and tourism purposes. The capital symbolizes success, growth, and new opportunities, making it appealing to regional tourists. Large-scale initiatives to green and beautify the city, particularly in the left-bank area and along the compositional axis of the Yesil River, also play a significant role in enhancing its appeal.

Following a detailed study of the city’s infrastructure, a map was created that highlights the districts with well-developed and attractive infrastructure for tourists.

Another crucial factor contributing to tourism growth is the hosting of international forums and dialogue platforms, which significantly boost the flow of foreign visitors.

International forums and conferences attract thousands of participants, including politicians, business leaders, scientists, and experts from various fields. These events provide platforms for discussing global challenges and exchanging experiences, thereby stimulating business and professional tourism. Attendees at these forums spend money on accommodation, transportation, dining, entertainment, and shopping, all of which support the city’s economy. This also creates jobs in the service and tourism sectors, further boosting the city’s appeal to investors and encouraging the development of its tourism infrastructure.

Hosting major international events also enhances Astana’s global visibility and reputation.

Over the past decade, Astana has hosted numerous major international forums and dialogue platforms, attracting participants from around the world. A key event is the Astana International Forum (AIF), launched in 2023 [<https://www.astanainternationalforum.org/en>] (accessed on 11 October 2024). The forum gathers over 5000 delegates from more than 50 countries, including heads of state, representatives from international organizations, business leaders, and academics.

Another notable event is the Astana Economic Forum [<https://forum-astana.org/en/>] (accessed on 18 October 2024), which regularly attracts international economists, politicians, and businesspeople to discuss economic issues, sustainable development, and international cooperation.

Additionally, events such as the Shanghai Cooperation Organization (SCO) Council of Heads of State and the CSTO Astana Summit strengthen Kazakhstan’s political and economic ties with other countries. As a result, the flow of international tourists has surged significantly in recent years (see Table 3).

**Table 3.** Number of visitors served by accommodation facilities in Astana (non-residents of Kazakhstan) [29,30].

Years	Number of People (Thousands/Year)
2019	570.505
2020	185.727
2021	183.472

Table 3. Cont.

Years	Number of People (Thousands/Year)
2022	480.965
2023	700.482
2024	1164.418

From the table, it is evident that external tourist flow has fluctuated over the years. The decline in visitors from 2019 to 2021 is clearly linked to the COVID-19 pandemic. Starting in 2022, there has been a significant surge in the influx of international tourists. In 2024, due to the hosting of the large-scale World Nomad Games (<https://worldnomadgames.kz/>) (accessed on 6 November 2024), an increase in tourist numbers has been observed.

International forums and platforms often include cultural programs, exhibitions, and excursions, allowing participants and guests to become more familiar with the city's culture and history. This creates additional motivation for tourists to extend their stay or return for the purpose of exploring the city's culture and attractions.

The development of smart technologies and "smart city" systems in Astana plays an important role in increasing tourist traffic and enhancing the quality of their stay:

- (1) Smart city systems make navigation in the city more convenient and comfortable for tourists. Intelligent transportation systems enable tourists to easily plan their routes thanks to accurate information about public transportation and taxi availability (e.g., Smart Astana app, Uber, Yandex Taxi).

Interactive maps and navigation apps (2GIS, Google Maps) simplify city orientation, allowing tourists to find interesting places and attractions without hassle.

Additionally, smart technologies improve safety in the city, a key factor for tourists. The use of "smart" surveillance cameras helps prevent crime and ensure safety on the streets and in tourist areas. As of today, as part of the "Сергек" project, 13,000 surveillance cameras monitor order and safety in the capital, 7000 of which are located in public places. In 2019, Russian experts recognized Astana as the safest city in Kazakhstan [48].

- (2) The growth of digital tourism is another important factor. Smart technologies enable the active development of digital tourism. In 2022, the smart system "Visit ASTANA" (<https://visitastana.kz/>) (accessed on 6 November 2024) was launched, providing detailed information about Astana's attractions, available events, and leisure activities. Tourists can plan their trips in advance using digital guides and virtual tours. Smart booking and payment systems make it easy and quick to purchase tickets for events and book hotels and restaurants. Tourists can also participate in online events and virtual tours, offering new opportunities for those unable to visit the city in person but interested in its culture and history.

In 2023, the smart platform "CITY PASS" was developed—Astana's city guide (<https://astana.citypass.kz/ru/>) (accessed on 6 November 2024).

Thus, the development of smart technologies and "smart city" systems not only enhances convenience and comfort for tourists but also creates new opportunities to attract more visitors, contributing to the city's economic growth. Accessible urban infrastructure and information systems adapted for people can collect data on tourists' preferences and use it to offer personalized routes, events, and services, thereby increasing traveler satisfaction.

In recent years, modern "smart cities" such as Barcelona have initiated strategic programs and digital policy frameworks with the objective of overcoming the limitations of the techno-deterministic approach [17]. This has led to a renewed focus on the real grassroots participation of citizens in the life and activities of the city, as well as the extent to which they influence decision-making and are not merely data providers.

The main trends in tourism today are digitalization, individualization, security, and decentralization.

## 5. Research Analysis

### 5.1. Transport Accessibility (Table 4)

The transport infrastructure of a city plays a pivotal role in determining its accessibility to tourists and their movements within the urban area. The study examined the following aspects of transport accessibility: *international and domestic transport links*.

Nursultan Nazarbayev International Airport provides regular air services to major cities around the world. However, despite the airport's high capacity, periodic flight delays and a limited number of direct international destinations reduce its competitiveness.

Railway services in Astana represent a significant component of the city's domestic transportation infrastructure. While the Nurly Zhol station has undergone modernization, concerns have been raised regarding congestion during peak periods.

**Table 4.** Prerequisites for the development of transport infrastructure.

Name of Infrastructure	Construction Year	Area (m <sup>2</sup> )	Prerequisites
Railway station—Akmolinsk	1929	1318.8	First building
Railway station—Tselinograd	1961	5260	Reconstruction in connection with the development of the Virgin Lands region
Railway station—Astana	2004	7560	Reconstruction in connection with the founding of the capital of Kazakhstan
Railway station—Nur-Sultan-1	2019	7560	Reconstruction and renaming in connection with the renaming of the capital
Astana Nurly Zhol Station	2019	110,000	New, modern railway station in the southern part of the city. The building consists of six separate floors, access to which is provided by elevators and escalators. On the third floor of the building there are railway platforms. On the fourth floor of the building there are many commercial places, shops, and cafes; there is also a waiting area and a glass window for observing trains on the railway on the third floor.
Airport—Akmola	1930–1961	2500	Flights on two routes (Semipalatinsk, Almaty)
Airport—Tselinograd	1961–1992	4000	Relocation of the airport 16 km from the city center of Akmola
Airport—Akmola	1992–1998	15,000	Reconstruction of buildings; variety of flights in Kazakhstan
Airport—Astana	1998–2009	22,000	Expansion of the airport in connection with the formation of the capital
Nursultan Nazarbayev International Airport (International Terminal)	2017	47,000	Reconstruction and addition of an international terminal. Increase in passenger flow to 5 million people per year.
Bus station—Akmolinsk	1987–1998	560	Opening of routes in three directions across Kazakhstan



Table 4. Cont.

Name of Infrastructure	Construction Year	Area (m <sup>2</sup> )	Prerequisites
Bus station—Saparzhay-Astana	1998–2009	2000	Reconstruction and relocation of the bus station in connection with the transformation into the capital
Bus station—Saparzhay-Astana	2009	8060	Reconstruction, increase in domestic flights, and opening of international flights to four countries (Russia, Uzbekistan, Kyrgyzstan, Tajikistan)

The urban transport system comprises buses, though there is a lack of a metro or tram network, which presents a challenge for tourists attempting to navigate the city.

The city of Astana has a public bus transportation system. To date, the network comprises 109 routes. The city is home to eight bus parks. The average daily ridership is 622,000 passengers. The maximum passenger flow was recorded in 2023, at 755,000 people. On an annual basis, the fleet is renewed, which contributes to an increase in demand for transport due to an increase in quality. Additionally, the annual expansion of bus lanes is a significant factor, as it allows route transport to reach its destinations without congestion in accordance with the schedule. This is an attractive factor for increasing passenger traffic for both the local population and tourists.

The infrastructure for alternative modes of transport, such as cycle lanes and electric scooters, which is currently insufficient, must be developed in accordance with the requirements of the modern era.

An analysis of tourist feedback indicates that navigation issues and an inadequate number of public transport routes have a detrimental impact on the overall comfort of travel.

The majority of tourist attractions, including Baiterek, Khazret Sultan Mosque, and the National Museum, are situated in close proximity and can be reached with ease. However, the lack of efficient transportation options to more remote locations, such as ethno-cultural centers and natural attractions, necessitates a considerable investment of time.

### 5.2. The Quality of the Accommodation

The hotel infrastructure of Astana encompasses a plethora of accommodation options, ranging from high-end hotels to budget hostels. The following parameters were subjected to an in-depth analysis in order to assess the quality of accommodation in the city:

The city of Astana is home to a number of international hotel chains, including Hilton, Marriott, and Radisson. This provides an attractive proposition for business travelers.

For those with limited financial resources, there is a selection of hostels and apartments available, though the quality of these options can vary considerably and there is often a discrepancy between the number of rooms available and the level of demand.

As part of the study, respondents were randomly surveyed in all neighborhoods of the city in hotels and hostels to assess the level of service. Over 1000 individuals were surveyed in 2024.

The questionnaire data indicate that business travelers hold the quality of service in mid- and high-class hotels in high regard. However, individual tourists have identified shortcomings in the adaptation of budget accommodation facilities to international standards.

The language barrier persists as a significant challenge. A notable proportion of hotels lack English-speaking staff, which creates difficulties for foreign tourists. While the cost of accommodation in medium- and high-class hotels aligns with international standards, budget options are often perceived as exceeding their fair market value in terms of the quality of services provided.

### 5.3. Public Spaces

Public spaces constitute an essential component of the tourism infrastructure, offering tourists opportunities for recreation, walking, and social interaction. An analysis of public spaces in Astana encompasses the following aspects:

The city's park spaces.

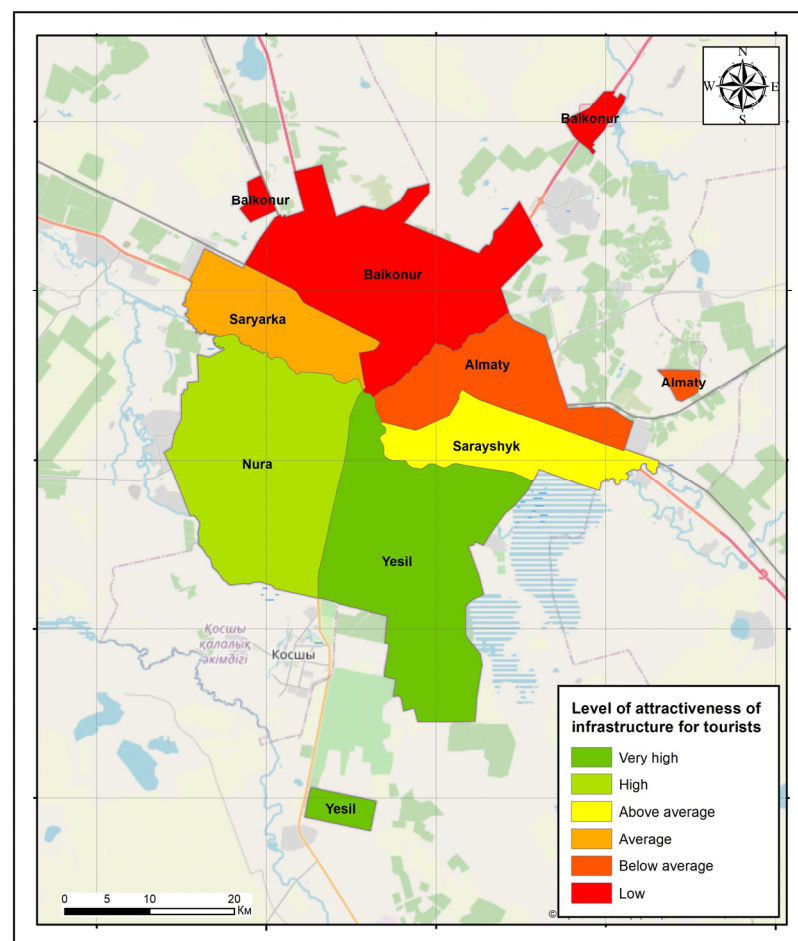
The city boasts modern park spaces, including the Presidential Park and the Astana Botanical Garden Park. These facilities are well frequented by tourists and residents alike.

Nevertheless, an analysis of the feedback indicates that some parks are lacking in infrastructure, specifically toilets, benches, and lighting, which detracts from the comfort of visitors.

The designation of certain areas as pedestrianized.

The city center boasts extensive pedestrian spaces, such as the square around Baiterek, which foster favorable walking conditions (see Figures 3, 4 and 9).

The absence of landscaped areas in the more distant districts from the city center represents a significant limitation for tourists seeking to explore the city's wider areas, particularly the gray districts of Baikonur and Saryarka (Figure 13).



**Figure 13.** Infrastructure development and attractiveness map (own development in the ArcGIS10.8 program). (Color-coded by district: high, above average, average, and below average levels of infrastructure attractiveness for tourists.).

Cultural and entertainment areas are also of note.

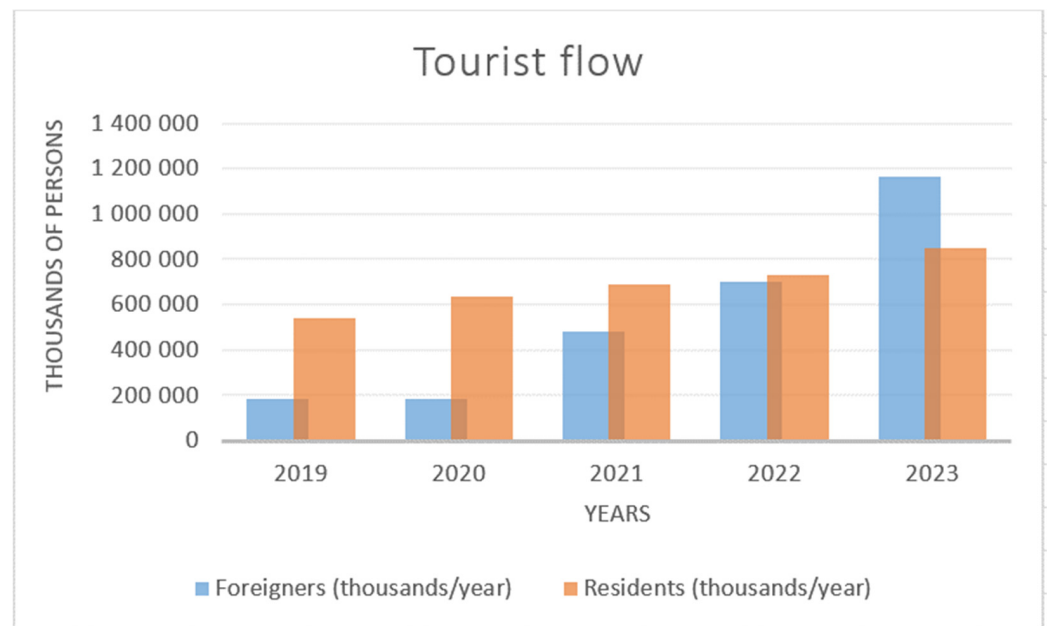
Cultural facilities, such as the National Museum of Kazakhstan and the Nazarbayev Center, are well equipped with modern multimedia systems and comfortable recreational areas. Restaurants, cafés, and shopping centers provide a variety of leisure options; how-

ever, in some tourist areas (Baikonursky and Almaty districts) there is a lack of local gastronomy and ethnic restaurants (Figure 13).

## 6. Conclusions

Astana is now one of the fastest-growing young capitals in the world. Its architecture has evolved with each stage of development, shaped by renowned architects, designers, and builders from both Kazakhstan and around the globe, each leaving their own mark on the city's history. As a result, Astana today presents a modern urban landscape, featuring a high level of infrastructure development and striking architectural landmarks.

According to the results of the study, we observed an annual increase in tourist flows of both residents and non-residents of the Republic of Kazakhstan, in direct dependence on the development of employment (Figure 14).



**Figure 14.** Tourist flow.

The annual increase in infrastructure in the capital is facilitating the development of the tourism sector. This is evidenced by the development of an international airport, an increase in the number of airline destinations, the development of a railway station, the development of a bus station, and an increase in international destinations. These developments are contributing to the growth of the tourism industry and enhancing the attractiveness of domestic and international tourism.

The analysis of the studies indicates that Astana has considerable potential for tourism growth, largely due to the city's modern infrastructure. However, there are several key areas that require attention and improvement. These include enhancing internal transport logistics, developing budget accommodation options, and modernizing public spaces.

The findings of the research indicate that a number of archeological monuments in Astana and its surrounding areas have been identified, which is expected to contribute to the development of local tourism.

In order to develop the tourist potential of Astana, the scientific group has proposed the following recommendations regarding infrastructure:

The issue of transport accessibility is of great importance in this context.

- It would be beneficial to establish agreements with international airlines with the objective of increasing the number of direct flights from key tourist regions, such as Europe, Southeast Asia, and the Middle East.

- It is recommended that tourist information provision at the airport be improved, including the introduction of multilingual signage and tourist information centers.
- Implement regular express public transport routes from the airport to the city center and major attractions. This recommendation is already in the process of implementation. Since 2017, a major project has been underway in Astana to construct an LRT (Light Rail Transit Route), which will connect the International Airport and the railway station and will traverse the entirety of Astana with multiple stations situated in the city center.

Expanding and enhancing public spaces, such as parks and squares, significantly influence tourism development in capitals and major cities worldwide. These areas not only improve the quality of life for local residents but also attract tourists by offering unique cultural and recreational opportunities.

The promotion and marketing of the destination is a key aspect of the tourism industry.

- In addition to the organization of forums and international venues, participation in international tourism exhibitions, such as ITB Berlin or WTM London, is recommended as a means of presenting Astana as a tourist destination.
- It is recommended that a brand platform be created for the city, with a particular focus on its distinctive features, including modern architectural projects, ethnic diversity, and cultural events.

An effective marketing strategy enables cities to differentiate themselves from their competitors, attract a greater number of tourists, and stimulate economic growth.

The 2017 Expo Astana provided an exemplar of effective brand promotion and marketing, initially establishing the capital city of Astana as a popular destination.

Consequently, the integration of the tourism strategy with the principles of sustainable development and international marketing will enable the capital to become a competitive tourist destination for both business and individual travelers.

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