Smart Sustainable Cities Profile

ALMATY, KAZAKHSTAN
NOTE

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This publication is issued in English and Russian.

United Nations publication issued by the Economic Commission for Europe (UNECE)

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This Smart Sustainable City Profile of Almaty was developed upon the request of the Almaty City Government with funds from the United Nations Development Account (UNDA) 12th tranche regional project “Smart Sustainable Cities for the 2030 Agenda for Sustainable Development and the New Urban Agenda in the UNECE Region”. The project is aimed at supporting the transition of selected beneficiary cities towards smart and sustainable development to accelerate the implementation of Sustainable Development Goal (SDG) 11 - sustainable cities and communities - and other urban-related SDGs.

The Housing and Land Management Unit of the UNECE Division of Forests, Land and Housing led the development of the City Profile in collaboration with the city government of the Municipality of Almaty (Almaty City Government) and the Government of Kazakhstan. The Profile provides the outcomes of the city evaluation against the Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC) and provides action-oriented recommendations for the City Government (Akimat in Kazakh) of Almaty and the Government of Kazakhstan to consider.

The KPIs for SSC is a public and freely available standard developed by the United Nations Economic Commission for Europe (UNECE) and the International Telecommunication Union (ITU) under the United for Smart Sustainable Cities (U4SSC) initiative. U4SSC is co-ordinated by UNECE, ITU and the United Nations Human Settlements Programme (UN-Habitat) and supported by 14 other United Nations agencies.*

* For up-to-date information on cities under KPI evaluation by UNECE, see https://unece.org/housing/sustainable-smart-cities
ACKNOWLEDGEMENTS

The United Nations Economic Commission for Europe (UNECE) wishes to acknowledge the following people for their contributions to the completion of this study:

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UNECE consultants

Anthony Salazar . . . . Consultant, UNECE (Analysis of KPI indicators, contribution to chapters)
Felix Schöneich . . . . Consultant, UNECE (Contribution to chapters)

The UNECE secretariat would like to express its gratitude to the following for providing data and information used in this city profile:

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<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Association Agreement</td>
</tr>
<tr>
<td>AAL</td>
<td>average annualized loss</td>
</tr>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
</tr>
<tr>
<td>AIIB</td>
<td>Asian Infrastructure Investment Bank</td>
</tr>
<tr>
<td>APVAX</td>
<td>Asia Pacific Vaccine Access Facility</td>
</tr>
<tr>
<td>AQI</td>
<td>air quality index</td>
</tr>
<tr>
<td>BEMS</td>
<td>Building Energy Management Systems</td>
</tr>
<tr>
<td>BREEAM</td>
<td>Building Research Establishment Environmental Assessment Method</td>
</tr>
<tr>
<td>CACCR</td>
<td>Central Asia COVID-19 Crisis Response</td>
</tr>
<tr>
<td>CAREC</td>
<td>Central Regional Economic Cooperation Program</td>
</tr>
<tr>
<td>CDIA</td>
<td>Cities Development Initiative for Asia</td>
</tr>
<tr>
<td>CHP</td>
<td>combined heat and power</td>
</tr>
<tr>
<td>CNG</td>
<td>compressed natural gas</td>
</tr>
<tr>
<td>CO2</td>
<td>carbon dioxide</td>
</tr>
<tr>
<td>DCFTA</td>
<td>Deep and Comprehensive Free Trade Area</td>
</tr>
<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
</tr>
<tr>
<td>EE</td>
<td>energy efficiency</td>
</tr>
<tr>
<td>EIB</td>
<td>European Investment Bank</td>
</tr>
<tr>
<td>EMF</td>
<td>electric and magnetic field</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>EUR</td>
<td>euro</td>
</tr>
<tr>
<td>FDI</td>
<td>foreign direct investment</td>
</tr>
<tr>
<td>GCAP</td>
<td>Green City Action Plan</td>
</tr>
<tr>
<td>GDP</td>
<td>gross domestic product</td>
</tr>
<tr>
<td>GFDRR</td>
<td>Global Framework for Disaster Risk Reduction</td>
</tr>
<tr>
<td>GIZ</td>
<td>German Corporation for International Cooperation</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and communications technology</td>
</tr>
<tr>
<td>IPCC</td>
<td>Intergovernmental Panel on Climate Change</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>ITDP</td>
<td>Institute for Transportation and Development Policy</td>
</tr>
<tr>
<td>ITU</td>
<td>International Telecommunications Union</td>
</tr>
<tr>
<td>JSC</td>
<td>joint stock company</td>
</tr>
<tr>
<td>KPIs</td>
<td>Key Performance Indicators</td>
</tr>
<tr>
<td>KZT</td>
<td>Kazakhstani tenge</td>
</tr>
<tr>
<td>LEED</td>
<td>Leadership in Energy and Environmental Design</td>
</tr>
</tbody>
</table>
LEPL . . . . . . . . . . . . Legal Entity of Public Law
LUMP . . . . . . . . . . . . Land Use Master Plan
MSMEs . . . . . . . . . . . . micro and small and medium-sized enterprises
MSW . . . . . . . . . . . . municipal solid waste
MSWSF . . . . . . . . . . . . municipal solid waste sorting facility
NAPR . . . . . . . . . . . . National Agency of Public Registry
NO\textsubscript{2} . . . . . . . . . . . . nitrogen dioxide
O\textsubscript{3} . . . . . . . . . . . . ozone
OECD . . . . . . . . . . . . Organisation for Economic Co-operation and Development
PM . . . . . . . . . . . . particulate matter
PPP . . . . . . . . . . . . purchasing power parity
SDR . . . . . . . . . . . . Special Drawing Rights
SDGs . . . . . . . . . . . . Sustainable Development Goals
SMEs . . . . . . . . . . . . Small and medium-sized enterprises
SO\textsubscript{2} . . . . . . . . . . . . sulfur dioxide
SSC . . . . . . . . . . . . Smart Sustainable Cities
SUDA . . . . . . . . . . . . Spatial and Urban Development Agency
tCO\textsubscript{2}\textsubscript{eq} . . . . . . . . . . . . . . . . . . tons of CO\textsubscript{2} equivalent
TUDA . . . . . . . . . . . . Transport and Urban Development Agency
USAID . . . . . . . . . . . . United States Agency for International Development
USD . . . . . . . . . . . . United States Dollars
USSR . . . . . . . . . . . . Union of Soviet Socialistic Republic
VAT . . . . . . . . . . . . value-added tax
WHO . . . . . . . . . . . . World Health Organization

Units of measurement
°C . . . . . . . . . . . . . . . . . . degrees Centigrade
km . . . . . . . . . . . . kilometre
kWh . . . . . . . . . . . . kilowatt hour
m\textsuperscript{2} . . . . . . . . . . square metre
mm . . . . . . . . . . . . millimetre
μg . . . . . . . . . . . . micrograms
Gj . . . . . . . . . . . . gigajoules
EXECUTIVE SUMMARY

Almaty is a vibrant metropolitan city. It serves as a significant hub for business, economy, culture and education both in Kazakhstan and Central Asia. It has set its sights on a vision of becoming one of the leading smart and sustainable cities in the UNECE region and beyond. Since gaining independence, Almaty, alongside the nation’s capital, Astana, has experienced tremendous growth, paving the way for significant progress in realizing the Sustainable Development Goals of the 2030 Agenda for Sustainable Development.

The Smart Sustainable City Profile of Almaty, which was developed between 2021 and 2023 at the request of the Almaty City Government, is an essential tool for achieving the SDGs. It is based on an evaluation that uses the Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC), which is a public and freely available standard developed by the United Nations Economic Commission for Europe (UNECE) and the International Telecommunication Union (ITU) under the United for Smart Sustainable Cities (U4SSC) initiative.

The results of the evaluation indicate the following:

- Strong performance in the ICT Infrastructure, Health, Environmental Quality, Public Space and Nature and Public Sector Governance areas
- Moderate to high performance in Education, Housing, Water and Sanitation
- Moderate performance in Social Inclusion, Safety, Culture, Waste, Transport and Employment
- Low performance in Innovation, Electricity Supply, Buildings (excessive heat consumption and no energy efficiency certification), Air Quality and Energy.
The analysis of the national and city-specific policy and institutional setup that support urban development in Almaty suggests that upscaling progress across the social, economic and environmental pillars of sustainable development requires targeted interventions in the following areas:

- Urban mobility
- Housing and building refurbishment
- Utilities sector
- Waste management
- Air quality management.

Successful implementation of these targeted interventions will require improvement in the:

- Overall urban policy and governance framework
- National quality system underpinning construction and urban infrastructure
- National and local monitoring and evaluation framework.

The Smart Sustainable City Profile offers practical recommendations for upscaling efforts to make the city smart and sustainable. The recommendations were developed in consultation with local and national authorities and will inform the work of UNECE in supporting the ambitious vision of Almaty. The recommendations of the Almaty City Profile suggest short-term measures and mid to long-term solutions to help achieve sustainable development in the city.
Almaty was the capital of Kazakhstan for almost seven decades, from 1929 to 1997. It is the largest city in Kazakhstan and remains the major commercial and cultural centre. Over one-third of all higher education institutions are located in Almaty. The city has ambitious plans to strengthen its position as a major socio-economic hub in Kazakhstan by transitioning into a smart and sustainable city.

Despite the positive economic and demographic conditions, the city still faces several challenges. Air quality and pollutant emissions remain a significant concern, with official government sources differing from independent assessments. Additionally, renewable energy sources and electricity consumption pose serious challenges for the city.

This City Profile aims to help the local and national government bodies of Almaty realize its vision of becoming a smart sustainable city. It was prepared at the request of the city government and based its analysis on the results of an evaluation using the United Nations Economic Commission for Europe (UNECE) Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC) and a desk review of local and national urban development plans and initiatives. This was followed by face-to-face and online interviews with local and national government officials, as well as experts, to gain insights into the city’s immediate and strategic, long-term development challenges and priority needs. This City Profile was developed from mid-2021 to late 2022, in close consultation with the city government of Almaty (Akimat) and the Government of Kazakhstan.

The KPIs for SSC consist of 112 quantifiable performance measurements for evaluating cities against a common set of benchmarks of excellence that can be used to track progress towards the achievement of the Sustainable Development Goals (SDGs). The indicators cover the economic, social and environmental dimensions of the 2030 Agenda for Sustainable Development (2030 Agenda), with information and communications technology (ICT) integrated as a cross-cutting “means of implementation”.

The emphasis therefore is on supporting city leaders to use ICT for improving the quality of life of all inhabitants and bolstering their cities’ overall competitiveness in a manner that is consistent with the 2030 Agenda principle of policy coherence. Thus, KPIs provide city leaders with a consistent and standardised method for collecting data and measuring performance, as well as a practical reference framework for an integrated, indivisible and balanced treatment of the SDGs.

1 The KPIs were developed jointly by UNECE and the International Telecommunication Union (ITU) and have been used in over 150 cities across the globe. The indicators were endorsed by the UNECE Committee on Urban Development, Housing and Land Management in 2016 (ECE/HBP/2016/4) to form the basis for the United for Smart Sustainable Cities (U4SSC) initiative. The U4SSC initiative brings together sixteen United Nations agencies and supports the evaluation of the performance of cities using the KPIs for SSC and the implementation of SSC solutions through the development of guidelines, studies, city action plans and capacity-building events [https://u4sscituint/]. The KPIs are detailed in the Collection Methodology for Key Performance Indicators for Smart Sustainable Cities (https://unece.org/housing-and-land-management/publications/collection-methodology-key-performance-indicators-smart).

2 Established under SDG 17 “Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development”, “means of implementation” is to be understood as “the interdependent mix of financial resources, technology development and transfer, capacity-building, inclusive and equitable globalisation and trade, regional integration, as well as the creation of a national enabling environment required to implement the new sustainable development agenda, particularly in developing countries.” For further details, see UN DESA, Technical Support Team brief (https://sustainabledevelopment.un.org/content/documents/2079Issues%20Brief%20Means%20of%20Implementation%20Final_TST_141013.pdf).
This City Profile is organized into six chapters. The introduction gives an insight on the preparation of this Profile, chapter II provides an overview of the salient features of Almaty, including its topology, urbanization patterns and climate change challenges, and chapter III presents the socio-economic impact of the COVID-19 pandemic at the national and local levels. The institutional and financial framework underpinning the city’s urban development along with its development priorities set the context for the analysis in chapter IV. Chapter V analyses the results of the evaluation of the performance of Almaty against the KPIs for SSC backed up by evidence highlighting remaining challenges and efforts toward smart, sustainable urbanism. Based on the information gathered from each chapter, action-oriented recommendations were developed, and these are provided in chapter VI.
II. GENERAL OVERVIEW

Location, topography and hydrography

Almaty is the largest and most populous city of Kazakhstan. It has a favourable geographic location and a highly developed economy, with excellent connectivity to major transport arteries. One of the most notable features of Almaty is its location in a valley in the south-eastern part of the country, nestled in the foothills of the Zailisky Alatau mountain range. The southern and eastern suburbs of the city offer stunning views of the surroundings, with Pik Talgar (4,979 metres), a northern peak in the Tian-Shian mountain range, only 30 km away.

Almaty is also known for its abundance of freshwater resources, woods, natural areas and recreational facilities. The surrounding area has 22 rivers and four man-made reservoirs. The Almaty region has large resources of groundwater suitable for drinking, agricultural and industrial use, making it an essential resource for the region. The city has two main rivers, the Large and Small Almatinka, which are fed by glacier water. During the summer months, the glacier water provides a natural source of cooling and drinking water, as well as an irrigation source that is much needed when temperatures soar beyond 30°C for several days. In winter months, the average temperatures reach a low of -8°C, which is characteristic of a typical continental climate.²

4  Environmental Performance Reviews: Kazakhstan - Third Review, Environmental Performance Reviews, Series No. 50 (United Nations publication, 2019). Available at https://unece.org/sites/default/files/2021-08/ECE_CEP_185_Eng_0.pdf


Almaty, like many other cities, faces certain environmental challenges. One of the major issues is the presence of large contaminated areas and territories in the Almaty Oblast, characterized by high water salinity, hardness of water and concentrations of sulphates and chlorides.³ Moreover, the mountains that provide the city with its beautiful panorama could contribute to poor air quality, especially during winter, due to temperature inversions. These, combined with high emissions of air pollutants from traffic and industries, can significantly affect people’s health. The situation can be further worsened by the construction of high-rise structures, which is an ongoing trend in the city.⁵

Furthermore, Almaty is located on the mountainous active tectonic plate of Zailisky Alatau, making it prone to seismic activity. The city has experienced several earthquakes over the last century and a half, some of which have caused significant damage, such as the 1887 earthquake. The high seismicity, with earthquakes of up to a 7.3 magnitude, poses a significant risk of violent ground movements within the city limits. Mudflows and landslides, along with their cascade impacts, are additional concerns due to the rough topography and the substantial loess deposits under the expanding city’s perimeter. The steep loess hills saw severe landslides during the 1887 earthquake, and with ongoing urban expansion, those hills now pose a serious concern to urban structures built on or by them. A powerful earthquake in Almaty could potentially cause numerous slope failures and impact densely populated areas, interrupt utilities and vital lifelines, obstruct roadways and harm vital built infrastructure.

Climate change impacts

The landscape of Kazakhstan is mostly made up of lowlands and low mountains, which account for about one third and one fifth of the country’s area, respectively. The Caspian Sea is the only significant body of water nearby, which contributes to a continental climate with long, hot summers and cold winters. The average temperatures in Kazakhstan range from -12°C in winter to 23°C in June, July and August, with a low average annual precipitation of 14-30 mm. In Almaty, the average temperatures vary from -6°C in winter to 18.9°C in the summer, with an average annual temperature of 6.5°C. The city experiences its highest precipitation levels in May at 150 mm and its lowest in January at 32 mm (see figure 1).

Climate data for Kazakhstan indicates that average temperatures have increased over the 20th century, particularly since the 1980s. From 1997-2010, temperatures were about 0.3-1.4°C higher compared to the baseline period from 1971-2000. On average, temperatures increased by 0.28°C per decade between 1941 and 2011. Although precipitation trends are not as clear as temperature changes, climate changes can be observed across the entire country. Due to its location in the southern region of the country, Almaty experiences less extreme temperatures, with less cold winters and slightly warmer summer months.

According to using RCP emissions pathways RCP2.6 and RCP8.5 against the reference period of 1986-2005, Kazakhstan is expected to experience a significant increase in average daily temperatures ranging from 1.7°C (RCP2.6) to 2.8°C (RCP8.5) for the period 2040-2059 and from 1.6°C (RCP2.6) to 5.8°C (RCP8.5) for the period 2080-2099. The latter scenario (under RCP8.5) suggests Kazakhstan could experience a faster temperature rise compared to most other Asian countries and the projected global average increase of 3.7°C. General Circulation Models (GCMs) projections also show an increase in the average annual precipitation, but there are considerable differences between the models in the direction and magnitude of change.

Due to its geographical location, Almaty Oblast is vulnerable to a range of natural hazards expected to be worsened by climate change. These include riverine flooding, ice jams, as well as droughts, floods, avalanches, landslides and extreme weather events that can negatively impact agriculture and power systems. Almaty Oblast has the highest frequency of extreme weather events in Kazakhstan, such as heavy rains, strong winds, heavy snow and blizzard.
Riverine flooding rose by 35 per cent between 1991 and 2015. During the same period, the number of ice jams in the country tripled, and their frequency increased by 33 per cent in the Almaty region. This highlights the growing risk of climate change-related natural disasters in the city. In July 2015, an incident involving a glacial lake overflow resulted in the Kargalinka River overflowing, sending flood waters and mud towards Almaty.


Urbanization trends

In the past two decades, Almaty has experienced significant growth. The city almost doubled in size, from covering an area of 33,300 hectares in 2001 to 68,000 hectares in 2021. The population of Almaty has also increased from 1.13 million in 2001 to 2.1 million in 2021, an impressive 85 per cent increase, especially when compared to the country’s 28 per cent population growth during the same period (see figure 2).

Between 2012 and 2021, almost 600,000 people migrated to Almaty to settle permanently and only 315,000 people left, resulting in a net positive migration balance of 285,000 people. The majority of newcomers are of working age (88.5 per cent in 2021) and the share of newcomers with higher education has increased significantly from 30.4 per cent in 2011 to 61.4 per cent in 2021.14

If the current pace of population increase continues, the population of Almaty is expected to exceed 3 million people by 2030, which will create new challenges for urban planning. At present, only the city centre is being developed in line with the population growth, which contains around 70 per cent of the social infrastructure of Almaty.15

Kazakhstan has cities like Almaty and Astana that experience high positive rates of net internal and transnational migration. However, there are also southern regions such as Turkistan and Zhambyl that experience large negative migration rates and are traditionally seen as a source of internal migrants.16

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15 In accordance with the Comprehensive Plan “New Almaty” for 2020 – 2024 (see https://adilet.zan.kz/ru/docs/P2000000023).

II. GENERAL OVERVIEW

Figure 2  Population growth of Kazakhstan and Almaty, by year, 1991-2022 (Millions)


Figure 3  Kazakhstan: Net internal migration, by region, January to March, 2022 and 2023

Source: Bureau of National Statistics of Agency for Strategic Planning and Reforms of Kazakhstan.
The oil and mineral resource sectors have been a driving force behind internal migration in Kazakhstan, particularly since 2000. Although the labour demand in the oil industry may not be very high, the economic benefits from its boom have led to increased construction activity and other related activities in the city.

Urbanization is one of the main pillars of the national development strategy of Kazakhstan for 2050. However, the rapid growth of Almaty has had significant impact on both housing prices and demographics. The oil and mineral resource sectors have been a driving force behind internal migration in Kazakhstan, particularly since 2000. Although the labour demand in the oil industry may not be very high, the economic benefits from its boom have led to increased construction activity and other related activities in the city.

Figure 4 Net migration in Kazakhstan, by region, 2018-2022

Source: Bureau of National Statistics of Agency for Strategic Planning and Reforms of Kazakhstan.


II. GENERAL OVERVIEW

Urban economic profile

Almaty has experienced remarkable economic growth in the years following independence, with a shift towards a service-oriented economy. It is the country’s largest economic centre and a major hub for industrial development and trade, ranking second in terms of gross regional product (GRP). While Kazakh exports are heavily reliant on oil and related products, Almaty does not have this resource base.

Almaty is known for its thriving small and medium-sized business community. In 2021, it had the highest percentage of the country’s total number of active small and medium enterprises (SMEs) (see table 1). As of December 2021, SMEs contributed 47.5 per cent of GRP and provided a significant share of total employment in the city.

Over the past two decades, unemployment rates in Almaty have been declining. However, the rate has been slightly higher than the national average during the period between 2001 and 2021. In 2021, the unemployment rate in Almaty stood at 5.2 per cent, while the national rate was 4.9 per cent.

A review of the main economic performance metrics of Kazakhstan clearly demonstrates the strategic importance of Almaty in promoting both regional and national economic growth. The city’s GRP shows a growth trend, bringing its share of the national gross domestic product (GDP) to 17.9 per cent in 2021. Additionally, Almaty is a major contributor to job creation, accounting for the largest share of the country’s total employment (11.2 per cent) in 2021.

Table 1  City of Almaty: Registered business entities, by economic sector, 2021

<table>
<thead>
<tr>
<th>Type of business</th>
<th>Number of entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fisheries</td>
<td>1,009</td>
</tr>
<tr>
<td>Mining and quarrying</td>
<td>1,025</td>
</tr>
<tr>
<td>Manufacturing industry</td>
<td>6,411</td>
</tr>
<tr>
<td>Supply of electricity, gas, steam, hot water and air conditioning</td>
<td>467</td>
</tr>
<tr>
<td>Water supply, waste collection, processing and disposal, pollution removal services</td>
<td>406</td>
</tr>
<tr>
<td>Construction</td>
<td>12,960</td>
</tr>
<tr>
<td>Wholesale and retail sales, repair of motorcycles</td>
<td>46,055</td>
</tr>
<tr>
<td>Transportation and storage</td>
<td>6,566</td>
</tr>
<tr>
<td>Accommodation and food service</td>
<td>3,345</td>
</tr>
<tr>
<td>Information and communication</td>
<td>6,789</td>
</tr>
<tr>
<td>Financial and insurance services</td>
<td>2,353</td>
</tr>
<tr>
<td>Real estate transactions</td>
<td>6,591</td>
</tr>
<tr>
<td>Professional, scientific and technical service</td>
<td>12,844</td>
</tr>
<tr>
<td>Administrative and support services</td>
<td>6,565</td>
</tr>
<tr>
<td>Public administration and defense; mandatory social security</td>
<td>262</td>
</tr>
<tr>
<td>Education</td>
<td>4,506</td>
</tr>
<tr>
<td>Health care and social services to the population</td>
<td>2,707</td>
</tr>
<tr>
<td>Arts, entertainment and recreation</td>
<td>2,155</td>
</tr>
<tr>
<td>Providing other types of services</td>
<td>17,408</td>
</tr>
</tbody>
</table>

Source: Bureau of National Statistics of Agency for Strategic Planning and Reforms of Kazakhstan.


Figure 5  Almaty: Gross Regional Product (GRP) and share of selected economic activities, five-year average, 2000-2019 (Thousands of United States dollars)

Source: Bureau of National Statistics of Agency for Strategic Planning and Reforms of Kazakhstan.
Note: Selected economic activities - industry, construction, services and agriculture.

Almaty has a largely service-oriented economy. According to 2021 data, services and trade account for 86.1 per cent of the GRP structure, with the largest contribution (34.6 per cent) from wholesale and retail trade.
III. SOCIO-ECONOMIC IMPACT OF THE COVID-19 PANDEMIC

National overview

The first case of COVID-19 in Kazakhstan was detected at the beginning of March 2020. To mitigate the spread of the virus, the Government implemented restrictive measures such as suspending activities in educational institutions, public places and non-essential businesses, and limiting public transport services. Moreover, the government introduced policies to address the economic shock brought on by the pandemic, including banning exports of some key food products and regulating food prices for “socially important goods” through a national commodity distribution system.

However, these measures had significant negative effects on the national economy, which was already struggling due to falling commodity prices, including oil. Weaker economic activity, travel restrictions and reduced mobility were projected to contribute to reduced global demand for oil by 9 per cent in 2020.

In addition, reduced metal prices due to lower industrial commodity demand, particularly from China, compounded the exposure of the economy to fluctuations in the global market. The government is heavily dependent on commodity exports, such as exports of hydrocarbons, minerals and metals (84 per cent of total exports in 2017). The fall in global commodity prices contributed to the country’s economic crisis in 2020.

In response to the economic fallout of the pandemic, the Kazakhstani government implemented an “anti-crisis plan” worth USD 13 billion, equivalent to 9 per cent of the nation’s total GDP. This plan, designed to aid the local populace and provide support to the most vulnerable, including women, was divided into three main areas: health policy responses (USD 338.4 million), employment protection and support for vulnerable groups (USD 7.18 billion) and economic stimulus measures (USD 5.97 billion).

The education sector in Kazakhstan has been significantly impacted by the COVID-19 pandemic, with students, parents and teachers all feeling the effects. School closures have exacerbated pre-existing educational inequalities. A study has shown that the changes in education due to the pandemic have had severe consequences, particularly for students graduating or transitioning from primary to secondary school. However, quantifying the total learning losses due to issues such as academic dishonesty and parents completing assessments on behalf of their children.

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As of February 2022, Kazakhstan has seen a total of 101.5 COVID-19-related deaths per 100,000 people. While this figure is lower than the average for the WHO European Region (196.5 per 100,000 people), it is possible that it may be an underestimation. The pandemic has also adversely affected access to essential health services in the country leading to a variety of societal impacts, including mental health issues.

The health system of Kazakhstan is currently transitioning towards a more decentralized model, although the central government retains significant control. The Ministry of Health, which owns all national clinics and research centres, is tasked with formulating national health policies and legislation, as well as facilitating international cooperation. On the other hand, regional (oblast) health departments are responsible for managing and providing primary, secondary and tertiary health-care services within their jurisdictions, excluding research centres operated by the Ministry of Health. These departments oversee state-owned hospitals and polyclinics, operating with a relatively high degree of autonomy.
II. SOCIO-ECONOMIC IMPACT OF THE COVID-19 PANDEMIC

Box 1 Key COVID-19 recovery assistance received by Kazakhstan

The Government of Kazakhstan took extensive measures to combat the economic and epidemiological effects of the pandemic. In March-April 2020, the Government allocated KZT 125.2 billion (USD 297 million) to the health system to deliver a coordinated response aimed at containing the pandemic. Moreover, to safeguard households and local businesses from the economic recession, the Government, in collaboration with the Central Bank and the Agency of Kazakhstan for Regulation and Development of the Financial Market, introduced a set of anti-crisis measures amounting to USD 13 billion or 9 per cent of GDP. In addition, Kazakhstan also benefited from funds from international initiatives aimed at supporting recovery from the pandemic:

- In April 2020, the European Union Central Asia COVID-19 Crisis Response (CACCR) solidarity package provided funding worth EUR 3 million (KZT 1.4 billion) to the World Health Organization (WHO) to support the health system of Kazakhstan and other Central Asian countries better respond to the pandemic, especially the vulnerable groups.

- In April 2020, the Asian Development Bank (ADB) announced a USD 20 billion response package to assist Kazakhstan in countering the severe macroeconomic and health impacts of the pandemic, including USD 2.5 billion in concessional and grant sources as well as USD 2 billion for the private sector (non-sovereign).

- In June 2020, the European Bank for Reconstruction and Development (EBRD) provided a local currency loan of USD 40 million for the microfinance organization KMF aimed at addressing the liquidity needs of the micro-, small and medium-sized enterprises (MSMEs) throughout the pandemic period.

- In July 2020, the Asian Infrastructure Investment Bank (AIIB) approved a loan of EUR 661.8 million to provide budgetary support to the Government of Kazakhstan in its efforts to mitigate the effects of the pandemic on health, income and economic activities of the population.

- In December 2020, ADB announced the Asia Pacific Vaccine Access Facility (APVAX) amounting to USD 9 billion. The APVAX vaccine initiative offers rapid and equitable support to developing member countries in their efforts to procure and deliver safe and effective COVID-19 vaccines.

- In May 2021, the United States Agency for International Development (USAID) allocated USD 6.2 million to assist the local health system via the USAID Local Health System Sustainability programme in addition to funding international organizations to better respond to the health impacts of the pandemic.

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Local overview: Economy, unemployment and environment

On 19 March 2020, the city of Almaty announced a state of emergency and enforced a city-wide lockdown in response to the COVID-19 pandemic. By 30 March, all economic activities, except essential deliveries, were halted. Over the subsequent months, certain industries were allowed to resume operations gradually. However, these local economic restrictions significantly affected the local economy and unemployment rates in both Almaty and Kazakhstan.

By April 2020, approximately 300,000 SMEs had ceased operations, and up to 1.5 million workers had either lost their jobs or were forced to take unpaid leave. In the city of Almaty alone, the number of factory workers fell by 266,000 and 80 per cent of entrepreneurs paused their operations. According to OECD estimates, the hardest-hit sectors were trade, tourism and catering services, which collectively employed over 1.6 million workers in 2020.

A study conducted by the Centre of Physical Chemical Methods of Research and Analysis of the Al-Farabi Kazakh National University in April 2020 aimed to evaluate the environmental impact of lockdown measures by measuring the daily air pollutant concentrations during the pre- and lockdown periods. The findings indicated a 21 per cent reduction in PM$_{2.5}$ levels, while CO and NO$_x$ levels dropped by 49 per cent and 35 per cent, respectively. However, O$_3$ levels increased by 17 per cent compared to pre-lockdown levels.

The study also highlighted that non-traffic-related pollution sources, such as coal-fired CHPs, heating systems, waste burning and bathhouses, significantly influenced the city’s overall air quality. While the reduction in traffic during the lockdowns may have positively impacted the city’s environment, factors like seasonal meteorological changes made it challenging to definitively assess the environmental impact.

The decrease in air pollution in 2020 was largely attributed to the city-wide lockdowns. With many public places closed and schools and businesses operating online, there was a significant reduction in vehicular traffic in Almaty.

Although the state of emergency in Kazakhstan was lifted on 11 May 2020, some quarantine and social distancing measures remained in place, with phased removal determined at the regional level. As of 16 January 2023, Kazakhstan has reported 1,495,580 confirmed COVID-19 cases and 19,072 deaths due to the virus. However, the country has administered 33,349,745 vaccine doses in an effort to curb spread of the virus.

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III. SOCIO-ECONOMIC IMPACT OF THE COVID-19 PANDEMIC

Figure 6  Almaty: Air pollution, by main aggregated indicators, 2018-2021

![Air pollution graph](https://www.kazhydromet.kz/ru/ecology/ezhemesyachnyy-informacionnyy-byulleten-o-sostoyanii-okruzhayuschey-sredy/2022)

Institutional framework

According to Law No. 148, local governance is carried out by local representative bodies known as Maslikhats (City Councils) and local executive bodies known as Akimats (City Governments). The City Councils are elected by the population of the local authority and are responsible for approving plans, economic and social programmes of development and the local budget, and reports on their execution, as well as approving local laws and regulations. The City Government, on the other hand, is responsible for carrying out regulatory and control functions to provide solutions for problems of local significance within the corresponding administrative and territorial unit. It is hosted by a regional or city governor (Akim), and each of the city’s eight districts is led by a district authority (Akimat) and has its own mayor (Akim in Kazakh). These districts are the Alatau District, Almaly District, Auezov District, Bostandyk District, Zhetisu District, Medeu District, Nauryzbay District, and Turksib District.

The Mayor, who is a representative of the President and the Government of the Republic of Kazakhstan, performs both the functions of state governance and local self-governance. The City Government is formed by the Akim and consists of Deputy Akims, the Akim’s office, eight District Akimats and 21 Departments, and is financed from the local budget.

The City Council of Almaty approves the staff structure of each District Authority. The City Government is responsible for various fields, including education, health care, social assistance, transportation and local roads, environmental protection, public sanitation, fire protection, public order, culture and local libraries, as well as water supply and sewage systems. However, urban development responsibilities in Kazakhstan are distributed across different levels of government, leading to areas of uncertainty and significant overlaps in expenditure powers. Housing and utility services, transport and energy efficiency are examples of urban-related fields where all levels of government seemingly have some portion of responsibility. For example, the Almaty Green Growth Project suffered from ongoing debates between the oblast and the City Government, with both interested in being responsible for the project. This complexity can cause expenditures to become less effective, and accountability to become unclear.


In Almaty, the City Government produces a regional planning scheme for the region and master plans for the city and submits them to the City Council for review. The City Government also approves the development of utility networks and infrastructure, as well as the building, reconstruction, and rehabilitation of city assets, municipal property, and social and cultural facilities. The City Government has 23 departments, which are sector-specific and function like ministries. Additionally, there are four Deputy Akims who supervise the activity of departments functionally clustered as: finance and utility sectors; economy, entrepreneurship, state assets and environment; religion, culture, sport and youth affairs; and health, social, labour and education. Only the Department of Digitalization falls under the direct supervision of the Akim of Almaty.

### Funding and financial framework

On 15 July 2022, the Government of Kazakhstan adopted the Concept of the Investment Policy of Kazakhstan until 2026, which aims to improve the investment environment in the country by increasing and diversifying foreign direct investments (FDI).

To support investors in the regions, special deputy mayors have been appointed, and there are representatives of Kazakh Invest, investor service centres and regional investment headquarters in each region. The Socio-Entrepreneurial Corporation (SEC) was established as a regional development institution in the form of a joint stock company (JSC) to promote the region’s economy, with the controlling stake belonging to the state. SEC manages assets, provides business support and implements the “one-stop shop” principle for domestic and foreign entrepreneurs and investors to attract investments and support finished projects. In Almaty, the JSC SEC “Almaty” was established by a decree of the Government of Kazakhstan of 31 March 2010. All shares are held by the Department of Entrepreneurship and Investments of Almaty City. SEC Almaty focuses on:

1. Provision of resources (objects and land plots);
2. Attraction of investments;
3. Business lending;
4. Participation in programmes to support and develop entrepreneurship.

Kazakhstan has laws in place for public-private partnerships (PPPs) and concessions that provide a legal basis for PPP projects. To facilitate PPP, including through FDIs, a Regional PPP Centre operates in Almaty. As of the end of 2021, there were 74 PPP projects registered in Almaty, including 65 ongoing, 7 planned and 2 tendered projects. Among the ongoing large PPP investment projects are the construction of the Almaty Ring Road (concession) for USD 1.4 billion; a Light Railway Transit in Almaty for USD 300 million and the Almaty Railway Bypass for USD 300 million.

### Notes


42 Law No. 167 of 7 July 2006 (https://adilet.zan.kz/eng/docs/Z060000167_).


### Table 2  
Concept of the Investment Policy of the Republic of Kazakhstan until 2026: Target indicators

<table>
<thead>
<tr>
<th>Main indicator</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target indicator 1: Investment to main assets (% GDP)</td>
<td>17.5</td>
<td>21.0</td>
<td>23.0</td>
<td>25.0</td>
<td>25.1</td>
</tr>
<tr>
<td>Target Indicator 2: Gross FDI (billions of USD)</td>
<td>24.0</td>
<td>24.4</td>
<td>24.8</td>
<td>25.1</td>
<td>25.5</td>
</tr>
</tbody>
</table>


### Table 3  
Budget of the city of Almaty, 2022 and 2023  
(Millions of United States Dollars)

<table>
<thead>
<tr>
<th></th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>2,615.76</td>
<td>2,231.44</td>
</tr>
<tr>
<td>Tax revenues</td>
<td>2,080.25</td>
<td>1,853.93</td>
</tr>
<tr>
<td>Non-tax revenues</td>
<td>39.48</td>
<td>9.63</td>
</tr>
<tr>
<td>Proceeds from the sale of fixed assets</td>
<td>64.04</td>
<td>34.02</td>
</tr>
<tr>
<td>Transfer receipts</td>
<td>432.08</td>
<td>333.87</td>
</tr>
<tr>
<td>Costs</td>
<td>2,407.25</td>
<td>2,217.52</td>
</tr>
<tr>
<td>Net budget lending</td>
<td>44.89</td>
<td>7.62</td>
</tr>
<tr>
<td>Balance on operations with financial assets</td>
<td>250.78</td>
<td>8.37</td>
</tr>
<tr>
<td>Acquisition of financial assets</td>
<td>251.71</td>
<td>8.74</td>
</tr>
<tr>
<td>Budget deficit (surplus)</td>
<td>-87.16</td>
<td>-2.07</td>
</tr>
<tr>
<td>Financing of the deficit (use of surplus) of the budget</td>
<td>87.16</td>
<td>2.07</td>
</tr>
</tbody>
</table>

Source: Akimat of Almaty.

Note: Rate 1 USD = 460.48 KZT (2022) and 1 USD = 452.9 KZT (average official USD-KZT currency rate by the National Bank for 2022 based on six months of 2023); [https://www.nationalbank.kz/ru/news/oficialnye-kursy](https://www.nationalbank.kz/ru/news/oficialnye-kursy).

Municipal spending in Almaty is determined by the Almaty City Strategy and Budget Department. In 2022, the city budget spent KZT 977.93 billion, which was adjusted in March 2022 due to the available free balances of funds from the previous year to the amount of KZT 48.9 billion.45

45 Based on a survey conducted in 2021 by the United Nations Economic Commission for Europe for this Smart Sustainable Cities Profile.
National level development plans

The Government of Kazakhstan defines the legal and institutional mechanisms for urban development in the country. It is responsible for developing the General Plan (master plan) of Kazakhstan, which is the country’s most important urban planning document. The General Scheme provides decision-making guidance to state and business structures on various aspects of urban development such as "the development of production, population distribution, engineering, transport, social and recreational infrastructure of national significance, environmental conservation and territorial function zoning." Additionally, all cities in the country, including the regional centres and the cities of Almaty and Astana, are required to have general plans according to article 47 of Law No. 242-II “On architectural, urban planning and construction activities in the Republic of Kazakhstan” of July 2001. The development and construction of settlements in the country are carried out based on these plans.

Kazakhstan approved a new state planning system in 2021 to improve the monitoring of national progress towards achieving the SDGs. The system is summarized in the Resolution of the Government of Kazakhstan No. 790 “On approval of the State Planning System in Kazakhstan” of 29 November 2017, which established country-specific SDG indicators for monitoring purposes. The key document for state planning according to the new state planning system is the Development Strategy of Kazakhstan until 2050.

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46 The main provisions of the General Scheme were approved by Resolution of the Government of the Republic of Kazakhstan No. 1434 of 30 December 2013 (Republic of Kazakhstan, 2016, p. 13).


City level development plans

Almaty is committed to have a clear vision for its urban development. It has several planning documents that outline its priorities and plans to achieve them:

- **Almaty Development Strategy 2050** (2019) emphasizes sustainable development. This includes creating a high-quality urban environment, developing human capital, building a highly efficient economy, and ensuring effective city management.

- **Almaty City Development Program until 2025 and medium-term prospects until 2030** (updated September 2022) outlines the city’s development plans taking into account the experiences and practices of leading cities around the world, expert opinions, and citizen feedbacks to make Almaty an attractive and comfortable place to live, work and visit.

- **New Almaty for 2020 – 2024** (January 2020), also known as “A City Without Outskirts”, is a comprehensive plan that implements the first principle of the Strategy for the Development of Almaty until 2050, which aims to achieve high living standards in all districts, a polycentric layout and convenient transport.

- **Green City Action Plan for the City of Almaty** (October 2022) focuses on seven urban sectors - land use, transport, water and wastewater, waste management, energy, buildings and industry. It provides an overview of all the necessary investments required in the next 5-10 years. The City Government of Almaty joined the EBRD Green Cities in 2019 to build a better and more sustainable future for the city and its inhabitants.

- **Municipal Energy Efficiency Plan for the City of Almaty** (2017), which is part of the “Energy Efficiency Transformation in Astana and Almaty” study financed by the World Bank’s Energy Sector Management Assistance Program, aims to improve energy efficiency in public and social facilities and enable a sustainable energy financing environment.

Annex 2 provides an overview of these planning documents and several other documents that aim to address the main urban challenges and priorities highlighted by City Government officials. These challenges and priorities revolve around making urban mobility sustainable, creating new green and recreational areas and ensuring that cultural heritage is preserved through housing renovations in the inner city.
Digital transformation

The digitalization of Almaty was given a high priority in the “Digital Kazakhstan” State Programme implemented from 2018-2022. The current “Smart Almaty” Digitalization Strategy for 2020-2025 is being implemented with the primary goal of developing an enabling digital environment in the city that allows for efficient deployment of public services, smart interaction and collaboration with private initiatives, ensuring sustainable development. This will be accomplished by deploying modern technologies and digital facilities in real time, as well as building human capacities. The implementation of Smart Almaty is based on tripartite collaboration among state bodies, the private sector and science to meet its objectives. By efficiently utilizing all available resources such as a digitalization roadmap, improved regulations and functional interactions and a portfolio of IT projects, Smart Almaty will be able to address the primary developmental problems of the city and make a significant impact.

To oversee the implementation of Smart Almaty, the Almaty City Department of Digitalization was established in 2019. It is responsible for ensuring compliance with national ICT requirements and international standards, monitoring the quality of digital public services and optimizing them further. The department works closely with the Ministry of Digital Development, Innovations and Aerospace Industry to contribute to the implementation of the “Digital Kazakhstan” State Programme.

Box 2 “Technological breakthrough through digitalization, science and innovation” national project

The “Technological breakthrough through digitalization, science and innovation” national project was established by Decree of the Government of Kazakhstan No. 727 of 12 October 2021 and by the Reference Standard for Smart Cities of Kazakhstan, approved by an Order of the Minister of Digital Development, Innovation and Aerospace Industry of Kazakhstan in July 2022. The project aims to promote digitalization in the country through the development of the ICT sector and promoting the use of digital tools in different areas of work and life of people, and increase the security of online data.

The project has also established Reference Standards for Smart Cities of Kazakhstan to ensure the implementation of common nationwide approaches for building “smart” cities. Digitalization projects in Almaty are also being implemented following these standards.

The Almaty Data Lake is a flagship project of the Department of Digitalization aimed at facilitating data exchange between public entities, private companies and academic institutions. Its goal is to establish a basis for data-driven decision-making, while also providing a secure platform for external subscribers, such as the IT Sandbox, to improve services for city residents through data sharing. The project has garnered support from the City Government and the private sector, with pilot segments already launched jointly by the Department of Digitalization, Singaporean Crimson Logic PTE Ltd and a local company, ALSECO JSC, in October 2020.


The pilot segments that combined a public database (State Database of Individuals) and a commercial database (Unified Utilities Payments) resulted in a significant increase in the database of utility service providers. This increase varied depending on the supplier, ranging from 23 per cent or more. For example, Almaty Su, a supplier of cold water, saw an increase of almost 258,000 new customers, which led to a revenue increase of KZT 58.7 million in March 2021 and KZT 55.7 million in April 2021. Similarly, the supplier of hot water, Almaty Heat Networks, increased its income by KZT 57.8 million or 11 per cent year-over-year and increased its consumer database by 243,387 people or 34.5 per cent.

The increase in income for the utility service providers is expected to lead to further investments in the modernization and development of the city’s utility infrastructure.

Additionally, the project has a segment to monitor the progress and status of nearly 50,000 graduates each year from universities and colleges in the city. This project is part of a broader effort by the City Government to improve and automate activities to improve the quality of life for citizens, which includes enhancing primary health-care services.

One of the key initiatives of the project is the digitization of the process for obtaining the preferential transport card “O NAY!” for students and schoolchildren. This will significantly reduce the waiting time for receiving the card from several weeks to just 15 minutes.

There is also a plan to automate the recognition of a citizen’s social status based on their registered official addresses. This will enable city services to better plan social protection measures for their residents. The City Government is collaborating with the National Chamber of Entrepreneurs “Atameken,” the Ministry of Labor and Social Protection, and “Uchet.kz” company to implement this project.

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Box 3  “ONAY!” Card – An electronic ticketing system

In 2015, Almaty introduced a new electronic payment and accounting system for public transport with the ONAY! Card. The system covers the public transport network of the city consisting of 158 routes with 2,449 public transport units (buses and trolleybuses) that are equipped with card payment terminals, portable cash terminals, controller portable terminals and driver assistant on-board computers. Since its inception, the system has sold approximately 3.5 million cards.

The Central Dispatch Office (CDO) oversees the round-the-clock monitoring, control and management of urban public transport traffic, resulting in enhanced passenger service quality. Being an independent office and a provider of centralized and automated approach to dispatching, CDO provides a true picture of the carriers’ performance on routes.

The implementation of the ONAY! card system has yielded substantial benefits, including:

- Minimizing the “shadow” turnover in passenger transportation, thereby boosting enterprise profitability manifold. Consequently, this industry’s annual turnover from 2016-2022 more than doubled. Notably, annual passenger traffic on public transport saw a significant rise compared to the pre-implementation period, with a 52 per cent increase by 2023.
- Upgrading the rolling stock of public transport by 98 per cent
- Establishing a transparent and rational system compensation and subsidies system for carriers
- Increasing the regularity of public transport services to 93 per cent by the end of 2022.
Since 2016, the Almaty City Government has been developing a digitized urban transportation model, building on the ONAY! Card system launched in 2015. The Transport Holding of Almaty, with its emphasis on smart data integration and data collection systems, has introduced geoinformation data and automated dispatcher control systems for urban passenger transport. This system facilitates the monitoring of passenger movement, distribution of passenger traffic and traffic speed at different times of the day.

The Smart Almaty strategy supports the city’s ambition of becoming smart and sustainable. It focuses on enhancing public transport accessibility and mobility by monitoring passenger flow in real-time and implementing unified video monitoring. The strategy also aims to improve governance and public services by expanding the number of electronic public services, including those offered by the Ministry of Health and the Ministry of Agriculture. A crucial component of the Smart Almaty Strategy is the development of an Open Data platform that integrates various geospatial data and layers.

The strategy also emphasizes the improvement of environmental governance by monitoring air and water quality, especially in highly polluted areas. This will be achieved by increasing the per capita number and area of green spaces. In addition, Smart Almaty plans to integrate energy and utilities management systems in buildings and implement projects for smart street lighting and municipal waste collection and removal.

To improve security in crowded places and prevent crimes and fires, Smart Almaty is implementing smart video monitoring and response systems. The city is also embarking on various projects to digitize and enhance health care, social inclusiveness and education systems through virtual platforms and services. These digital transformation initiatives are aligned with the Almaty Master Plan 2040, which envisions a polycentric and digitally smart city development.
V. KPI EVALUATION RESULTS

The city of Almaty reported data for 101 of 112 indicators (50 of 54 economic indicators, 22 of 28 environment indicators, and 29 of 29 society and culture indicators). The results of the KPI evaluation are visualized using the following colour scheme:

- Red is assigned to indicators with values that are 25 per cent below the corresponding benchmarks (see annex 3).
- Orange is assigned to indicators carrying values that are 25 to 75 per cent below the corresponding benchmarks.
- Green is assigned to indicators with values that exceed 75 per cent of the corresponding benchmarks.
- The city scored above the 75 per cent benchmark for 36 indicators, between 25 and 75 per cent for 8 indicators, and below 25 per cent for 22 indicators. Figure 7 shows a summary of the city’s performance against the KPIs for SCC.

KPI evaluation results: Economy

Of the 54 economy KPIs, Almaty reported data for 50 indicators. The evaluation against these indicators revealed good performance in the sub-areas of ICT infrastructure, water and sanitation and public sector governance; moderate performance in employment and transport; and poor performance in electricity supply, buildings (energy efficiency) and innovation. For other indicators, data was unavailable or insufficient. A summary of the evaluation by sub-area follows.

ICT infrastructure

The ICT infrastructure in Almaty is quite impressive, with almost all households (93.7 per cent) having internet access and 75.4 per cent having fixed broadband subscriptions. This translates to 95,000 wireless broadband subscriptions per 100,000 inhabitants. The city has 6,268 public Wi-Fi spots, and the coverage for 3G and 4G mobile services is 96 per cent and 83.5 per cent, respectively.

Water and sanitation

As for water and sanitation infrastructure, Almaty is performing strongly. All households (100 per cent) have access to drinking water and basic sanitation facilities. Furthermore, 83.8 per cent of households are served by wastewater collection services.

Almaty lost 30 per cent of supplied water within the distribution system indicating moderate performance in this indicator. Only 13.18 per cent of the water metres installed throughout the city qualified as “smart”. However, there was no data to assess the total percentage of the water distribution system monitored by ICT.

Almaty sources its water from rivers and aquifers. Rivers provide 40 per cent of the city’s water, while 60 per cent comes from aquifers. The state municipal enterprise “Almaty Su” is responsible for the city’s drinking water and hot water supplies and wastewater treatment. The centralized sewage system and biological wastewater treatment are available to 92.5 per cent of the population of Almaty. The quantity of treated wastewater naturally increases with the growth of the city. As of 2021, 98.8 per cent of wastewater was treated biologically.

56 The Order of the Department of the Committee for the Regulation of Natural Monopolies of the Ministry of National Economy of the Republic of Kazakhstan for the City of Almaty No. 58 of 23 June 2023 introduces the tariffs for water supply services from 1 July 2023 (http://almatyru.kz/?page_id=738&lang=ru).
To ensure continued improvement of the water supply and sanitation infrastructure, Almaty Su has a 2020-2024 investment programme in place. By 2025, the programme aims to introduce 775 km of water supply networks and 673 km of sewerage networks, as well as three water intake facilities with a total capacity of more than 46 m$^3$/day. The sewage treatment facilities will also be reconstructed utilizing modern and efficient technologies.  

Despite these efforts, there is still a considerable capacity for reducing per capita water abstraction and use through further reduction of water losses. Further improvement of water distribution infrastructure could significantly reduce water losses. Over 2,000 km of 3,600 km total water pipelines in Almaty are considered worn out, highlighting the need for infrastructure improvements.  

As of 2022, more than 12,000 metres per building and nearly 476,000 individual per apartment/house water metres were installed, of which 15 per cent are equipped with digital data transfer/monitoring.

Public sector management

The city of Almaty has shown strong overall performance in the public sector management sub-area, with 99.98 per cent public sector procurement activities taking place online. This is an indication of excellent performance by the city. Moreover, the city has made 154 public services available online and inventoried all open data sets which can be accessed by the public for consultation. This clearly shows the city’s commitment to making public services more accessible to its citizens.

By providing public services electronically, the city has not only made it easier for citizens to receive them but also eliminated the possibility of human error in data processing. In 2022 alone, the city provided 14.5 million public services, out of which 93.3 per cent were electronic. All of this impressive performance is backed by the Register of Public Services (approved by the Order of the Acting Minister of Digital Development, Innovation and Aerospace Industry of the Republic of Kazakhstan on 31 January 2020), which lists 165 types of public services provided for local executive bodies of the City of Almaty:

- 156 types of services - available through the “Electronic Government Portal”
- 7 types of services - no alternative “paper”
- 2 types of services – paper; provided on the principle of “one application”.

Urban transport

Almaty has a moderate performance in the area of transportation. Only 0.43 per cent of public transportation stops in the city provide dynamic public transport information and only 19.96 per cent of intersections have adaptive traffic control, indicating poor city performance. Furthermore, only 4 per cent of registered vehicles qualify as low-emission vehicles, contributing to air pollution. However, Almaty has a convenient public transport network, with 86.43 per cent of the population living within 0.5 km of a public transport stop.

As of 2022, there were 517,500 registered motor vehicles in Almaty, comprised of 90.2 per cent cars, 6.4 per cent trucks, 1.8 per cent buses and 1.2 per cent motorbikes. The city’s vehicle fleet has grown by more than 1,700 units annually over the past decade. The total length of the road network in Almaty is 3,097 km, which accounts for approximately 20 per cent of all local roads in Kazakhstan.

58 For more information on the Investment Programme of Almaty Su for 2020-2024, see https://almatysu.kz/wp-content/uploads/2020/01/%D0%A3%D1%82%D0%B2%D0%B5%D1%80%D0%B6%D0%B4%D0%B5%D0%BD%D0%BD%D0%B0%D1%8F-%D0%98%D0%9F-%D0%92-%D0%9A1-%D1%80%D1%83%D1%81.pdf.


60 Ibid.


Figure 7  Performance of Almaty against the Key Performance Indicators for Smart Sustainable Cities

Source: UNECE (2023).
The daily traffic in Almaty is estimated to consist of nearly half a million motor vehicles, including those from outside the city, leading to traffic congestion and a burden on the transportation system. During peak periods, travel time is three times slower. The vehicle fleet is responsible for 65 per cent of the dangerous pollutants released into the city’s air, with more than 122,000 tons released annually. To address these challenges and improve urban mobility, Almaty has been constructing various types of transport infrastructure. As of 2021, there are 140 overground and underground pedestrian crossings, 31 traffic interchanges and 140 tunnels and bridges.

The total length of public transport lines is 176.28 km per 100,000 inhabitants, including 4.4 km of bicycle lanes per 100,000 inhabitants. Forty per cent of travellers in the city use private vehicles or public transport each, with 17 per cent of travellers reporting walking and 3 per cent travelling by bicycle. There were 87 shared bicycles and 24.7 shared vehicles per 100,000 inhabitants. However, no data was available to assess the percentage of major streets monitored by ICT.

Employment

According to the survey for the KPI evaluation, Almaty has an unemployment rate of 5.2 per cent, including a youth unemployment rate of 5.7 per cent in 2021, indicating poor performance in the employment indicator. The tourism and ICT sectors dominate the economy of Almaty, which employ 2.96 per cent and 1.61 per cent of the total labour force, respectively. Compared to the national average, the youth unemployment rate in Almaty is higher, with an overall unemployment rate of 4.9 per cent and a youth unemployment rate of 3.8 per cent. The city’s high youth unemployment rate can be attributed to the large influx of internal migrants from rural areas seeking employment opportunities that the city is unable to provide.

Electricity supply

The city’s performance in the electricity supply sub-area is poor, with only 38.23 per cent of electricity metres being “smart” and only 1.33 per cent of the electricity supply system monitored by ICT. Despite these indicators, 100 per cent of households have an authorized connection to the electricity supply system. On average, the supply experiences 2.8 interruptions per year, with each interruption lasting around 3.1 minutes.

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One of the main issues with the electricity supply of Almaty is the worn-out networks. The city’s rapid growth has overloaded existing capacities, and reconstruction and modernization of the infrastructure and supply services are slower than required. The supply network of the Turksib District is worn out at a rate of 70 per cent, leading to frequent power cuts.

65 Even well-equipped networks experience service interruptions, and there are constant accidents in the electrical networks due to the deterioration of 5,600 km of transmission lines (65 per cent). Inefficient tariff policies exacerbate the problems of deterioration and breakdown of networks. Heat tariffs have increased 1.8 times (with an average annual increase of 4.1 per cent), and electricity tariffs have increased by 3.2 times (with an average annual increase of 8.1 per cent) in the past 15 years.

The system is in deficit because tariffs do not cover investment and operating expenditures and losses of utility companies are covered by the local budget. Without an increase in investment and a well-connected tariff policy, improving the quality of housing and utility services would be impossible.

Buildings

Only 0.57 per cent of public buildings in Almaty have recognized sustainability certifications for ongoing operations, indicating poor performance in the buildings sub-area. The unavailability of data made it impossible to assess public buildings using integrated ICT systems to automate building management. However, the buildings in Almaty are unique in that they have passports containing relevant information such as construction materials used, year of construction and energy efficiency (EE) ratings.

Some private buildings are certified as green buildings using the international certification system BREEAM or LEED. However, there is currently no national practice of green building certification in Kazakhstan. Even though new buildings need to comply with more stringent energy efficiency norms, these are not as strict as a dedicated standard for Green Buildings.

Many public buildings in Almaty were built several decades ago before energy standards existed. As a result, they have limited insulation and high energy consumption. The annual energy bill for these buildings represents 2 per cent of the municipal budget. However, refurbishment needs cannot be identified because of the absence of an energy audit.


Innovation

In terms of innovation, the performance of Almaty is poor, with low R&D expenditure at only 0.29 per cent of the city’s GDP and a high percentage of SMEs (98.79 per cent) without established benchmarks. At the time of the evaluation, there were 32.64 patents issued per 100,000 inhabitants.

Urban planning

Based on reported data, only 0.10 per cent of the total city area of Almaty is designated as a pedestrian/car-free zone. As such, the city foresees in its strategic planning documents improved connectivity, integration, urban land use, social inclusion and resilience to climate change.

Spatial development in Almaty has undergone several changes since 2002 but development is unequal due to improper redistribution of land resources, multiple enlargements of city limits by annexing land in the suburbs, land grabbing or self-build and modifications to legal criteria. As a result, the city faces several urban challenges like urban sprawl, poor and unaffordable housing stock, traffic congestion, air pollution and lack of green spaces.


68 Almaty City Akimat, Almaty city development programme until 2025 and the medium-term outlook until 2030.
To address these issues, Almaty has introduced a new urban planning approach with the Master Plan of Almaty until 2040 at its core. The plan is based on polycentricity and polyfunctional development, focusing on creating comfortable compact living spaces with human-scale neighbourhood development that allows for varied scenarios of city inhabitants’ life activities. The goal is to create five polycentres with economic specializations and a culturally significant historical centre linked to these polycentres by 2030:

- North: removal of industries, new recreation areas and developed service sector
- Eastern Gate: logistics hub exhibition and entertainment centre in the airport area, medical centres, and pharmacies
- Historic centre: tourism and developed services
- West: large industries, transport and logistics hub
- Southwest: mini-industrial parks, trade and logistics.

Each of the polycentres will have a master plan synchronized with the plans of the city of Almaty and its suburbs and Almaty region.

Other

Data on drainage was insufficient to assess the performance of Almaty in this area. Data was not available for the percentage of the drainage storm-water system covered by ICT monitoring.

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**KPI evaluation results: Environment**

Almaty reported data for 22 out of 28 environmental KPIs. The city showed good performance in the areas of environmental quality, public space, as well as nature, and water and sanitation. The city’s performance was moderate in the waste indicator but scored poorly in the air quality and energy sub-area indicators.

**Environmental quality**

Almaty has shown strong performance in environmental quality indicators, especially in exposure to excessive noise levels. Only 20 per cent of inhabitants have reported experiencing noise levels beyond 55 decibels, which is acceptable for humans. However, the unavailability of data for mobile network antenna sites throughout the city did not allow for the assessment of electric and magnetic field (EMF) exposure compliance.

**Water and sanitation**

The performance of Almaty in water and sanitation is impressive, with 97.7 per cent drinking water samples covered by an audited Water Safety Plan. Freshwater consumption per person per day is 359 litres, all of which is potable freshwater. Wastewater treatment is also at a high level, with 99.7 per cent and 98.7 per cent of wastewater undergoing primary and secondary treatment, respectively.

The quality of tap water in Almaty is higher than many other places in Kazakhstan, making it safe for consumption without additional purification. The water does not contain heavy metals, phenols or oil products. Its chemical composition is naturally balanced and has microelements necessary for humans. Moreover, it has safe radiation levels and is not contaminated by bacteria. However, due to the high volume of water from aquifers, the mineralization of drinking water in Almaty has increased.
The water is regulated by nationally established standards,\(^70\) and the chemical and bacteriological laboratory of the Almaty Su conducts regular monitoring. Surface and artesian fresh water undergo four-phased mechanical and chemical treatment before it is supplied to the population.\(^71\)

Per capita water abstraction and use are gradually decreasing, with water metering playing a role in increasing efficiency. According to the data of the Bureau of Statistics for 2013-2021, water abstraction decreased from more than 450 litres per capita per day in 2013 to almost 378 litres in 2021. Water use decreased from 404 litres per capita in 2013 to 359 litres in 2021. As of 2022, there were more than 12,000 water meters installed for multiapartment buildings (one per building) and nearly 476,000 water metres for individual housing/apartments, of which 15 per cent are equipped with remote data transfer/monitoring.\(^72\)

**Public space and nature**

Almaty scored strongly in public space and nature. The city boasts an impressive 1,253 hectares of green spaces per 100,000 inhabitants and 77 per cent of inhabitants live within 300 metres of green spaces. Additionally, the city has 5,206 m\(^2\) of public recreational facilities for residents to enjoy.

The city’s green spaces cover about 26,000 hectares and they have been found to collect up to 1.3 million tons of dust per year and produce up to 16,000 tons of oxygen. These highlight the importance of preserving and sustainably developing green spaces in the city, the main goal of the draft Green Space Development Strategy 2030 of the City Government. The strategy aims to increase the amount of green space per person from the current 7.7 m\(^2\) to 10 m\(^2\) by 2030 and increase the number of trees to five million while considering polycentricity and the link between green infrastructure and blue water networks.

To achieve its goals, the City Government plans to plant 1,158,380 trees by 2025 and 1,300,000 trees by 2030.\(^73\) The planting volume of new seedlings varies across different administrative districts, ranging from 5-7 m\(^2\) per person in the western and northern sections to 17 m\(^2\) per person in the Medeu district. The Bostandyk district has the highest amount of park spaces at 200.5 hectares, and Nauryzbai district has the lowest at only 8.46 hectares (see table 4).

Protected areas such as Ile-Alatau National Park, the Main Botanical Garden, the State Regional Natural Park Medeu and the Almaty Museum cover 31.3 per cent of green spaces in Almaty.\(^74\) The city of Almaty values its green spaces and recognizes the importance of sustainable development for the benefit of its residents. Overall, it is making significant efforts towards achieving its goals and improving the well-being of its citizens through its Green Space Development Strategy 2030.

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\(^70\) Order of the Minister of Health of the Republic of Kazakhstan No. 26 ‘On approval of the Sanitary Rules “Sanitary and epidemiological requirements for water sources, places of water intake for domestic and drinking purposes, domestic and drinking water supply and places of cultural and household water use and safety of water bodies’ of 20 February 2023. Available at https://adilet.zan.kz/rus/docs/V2300031934#z18.


\(^73\) Almaty City Akimat, Almaty City development programme until 2025 and the medium-term outlook until 2030.

\(^74\) Almaty City Akimat, Green City Action Plan for the City of Almaty, October 2022.
# V. KPI Evaluation Results

## Table 4

<table>
<thead>
<tr>
<th>Districts</th>
<th>Number of hectares</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alatau</td>
<td>29.57</td>
<td>5</td>
</tr>
<tr>
<td>Almaly</td>
<td>91.68</td>
<td>15</td>
</tr>
<tr>
<td>Auezov</td>
<td>59.38</td>
<td>9</td>
</tr>
<tr>
<td>Bostandyk</td>
<td>200.50</td>
<td>32</td>
</tr>
<tr>
<td>Medeu</td>
<td>97.43</td>
<td>15</td>
</tr>
<tr>
<td>Nauryzbai</td>
<td>8.46</td>
<td>1</td>
</tr>
<tr>
<td>Turksib</td>
<td>87.60</td>
<td>14</td>
</tr>
<tr>
<td>Zhetysu</td>
<td>56.75</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>631.37</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>


The state of trees in Almaty is very concerning as they are ageing rapidly and becoming damaged due to various factors such as car emissions, utility networks, street cleaning chemicals and construction work. There are currently around 84,000 damaged trees in the city, and 5,000 of them are expected to be cut down by the end of 2022 due to safety concerns. The trees that will be cut down are distributed across different districts as follows: 350 in Alatau district, 900 in Almaly district, 900 in Auezov district, 900 in Bostandyk district, 500 in Zhetysu district, 700 in Medeu district, 50 in Nauryzbai district and 700 in Turksib district. However, efforts are being made to address the issue. Over the past three years, more than 130,000 trees and shrubs have been planted in Almaty.

## Waste

According to available data, Almaty has a moderate performance in waste management, with 86 per cent of total waste being sent to sanitary landfills and 14 per cent being recycled. However, there is no data reported on solid waste that is disposed of through burning, incineration or in an open dump.

Currently, municipal garbage is collected without any segregation, which results in food waste accounting for 39.77 per cent of municipal solid waste (MSW), 10.53 per cent of plastic trash and 8.99 per cent of paper waste, including packaging waste, while the rest is unclassified due to non-segregation.

The city has only one municipal solid waste sorting facility (MSWSF), which was constructed as a public-private partnership project in 2018 for KZT 5.4 billion. It can handle up to 550 thousand tons of waste every year and can store and process wood waste. Authorities plan to expand its capabilities for the deep processing of secondary raw materials and establish a site for construction wastes.

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75 Almaty City Akimat, Almaty city development programme until 2025 and the medium-term outlook until 2030.

76 Almaty City Akimat, Green City Action Plan for the City of Almaty, October 2022.

77 Almaty City Akimat, Almaty city development programme until 2025 and the medium-term outlook until 2030.

Almaty has 82 waste collection operators in addition to the major waste collection operator, Tartyp Company, which serves the entire population. However, there are no established guidelines for municipal waste management. Only 20 per cent of landfills or 603 units nationwide meet hygienic and environmental standards, and the Karasai landfill that services Almaty does not conform to sanitary standards.

Air quality
Almaty has performed poorly in air quality as per the collected air samples which indicate an unfavourable air quality index (AQI). The environmental surveys conducted in Almaty revealed that the air has high levels of PM2.5 at 36 micrograms (μg), PM10 at 475 μg, nitrogen dioxide (NO₂) at 81 μg, sulfur dioxide (SO₂) at 34 μg and ozone (O₃) at 24 μg. However, the total greenhouse gas emissions per capita are relatively low, with only 13.9 tonnes of CO₂ emitted per person per year.

The main contributors to air pollution in Almaty are growing industries and air pollution. Stationary sources alone emit a significant amount of air pollutants and the city has close to 8,000 registered stationary sources emitting air pollutants in 2021. Air pollutants from these sources have significantly increased from 15,100 metric tons in 2006 to 46,100 metric tons in 2021. Meanwhile, the motor vehicle fleet was responsible for over 44,845 metric tons of air pollutants in 2020, which is more than 50 per cent of total emissions in Almaty.

Due to the city’s natural depression and temperature inversions, emissions accumulate and generate high concentrations of air pollutants. These geographical features contribute to high levels of urban air pollution.

Energy
Almaty has poor energy consumption performance, with only 5.1 per cent of energy coming from renewable sources. Electricity consumption is high, averaging approximately 650 kilowatt hours (kWh) per capita annually. Public buildings consume more energy than target levels, with 138 kWh per m² of floor space per year. The total thermal energy consumption per capita in Almaty is 10.21 gigajoules (GJ) per year.

According to the Almaty Municipal Energy Efficiency Plan for 2030, schools are the largest energy consumers among public buildings, followed by health-care units. Overheating in educational facilities and public offices is caused by a lack of thermostat valves to regulate the temperature of heating systems.

The housing stock in Almaty is in a dire need of renovation and energy efficiency improvements to reduce the high energy usage for heating. In 2018, the residential sector accounted for 30 per cent of the final energy consumption in Kazakhstan, making it the second-largest user after industry. High energy usage for heating is also due to long winters, old and poorly maintained housing stock and heat losses.

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79 Almaty City Akimat, Green City Action Plan for the City of Almaty, October 2022.
81 Almaty City Akimat, Green City Action Plan for the City of Almaty, October 2022.
83 Ibid.
85 Ibid., pp. 484-485.
Moreover, the deteriorating communal utility networks and inefficient tariff policies exacerbate the city’s energy consumption issues. About 60 per cent or 811 km of the total heat networks have reached the end of their service life and 36 per cent of gas networks are already worn out. The latter poses a challenge in ensuring a continuous, accident-free and secured gas supply to people. The deterioration and breakdown of the energy supply networks are also related to an inefficient tariff policy. In the past 15 years, the heat tariffs have increased 1.8 times by an average of 4.1 per cent annually and gas tariffs have increased by 2.1 times at an annual average of 5.2 per cent. 88

KPI evaluation results: Society and Culture

Almaty provided data for all 29 society and culture KPIs. The assessment of the KPI data for Almaty within this dimension showed excellent performance by the city in the housing, health and education sub-dimensions and moderate performance in safety, culture and social inclusion.

Housing

The analysis of the reported data showed that Almaty performed well in the housing sub-area, with only 3.7 per cent of the population living in slums, informal settlements or inadequate housing as of 2022. However, the housing expenditure is moderately scored, with 7.3 per cent of total household income reported as spent on housing at the time of the evaluation.

As of 2021, Almaty has the largest portion of urban housing stock in the country, at 19.9 per cent, and the second highest housing provision rate (29 m² per resident) after Astana (30.6 m² per resident). Despite the government’s efforts, housing remains a significant socio-economic issue in Almaty due to its high cost and poor condition. Its urban centre is 190 per cent more expensive to live in than the national average. Between 2001 and 2015, housing expenses quadrupled after accounting for inflation. 89

Moreover, the city is experiencing difficulties in replacing its old housing stock. Around 1,400 two-storey homes built between 1930 and 1975 have already reached the end of their service life, with over 60,000 citizens currently residing in these homes. Out of 948 dilapidated houses, the city has only demolished 56 in the past decade and built 63 multi-apartment residential buildings with 2,368 flats. 90

In particular, the demand for affordable rental housing is high in growing metropolitan areas that attract internal migrants. Currently, this demand is met only by rental housing owned by citizens operating in a semi-legalized commercial rental housing sector. 91

Health

Almaty performed excellently in the health sub-dimension, with 100 per cent of city inhabitants having electronic health records and 81.8 per cent covered by basic health insurance or the public health system. Moreover, the city has reported favourable maternal death rates and a high number of physicians and hospital beds per 100,000 inhabitants.

References

88 Almaty City Akimat, Almaty city development programme until 2025 and the medium-term outlook until 2030.
90 Almaty City Akimat, Almaty city development programme until 2025 and the medium-term outlook until 2030.
At the time of the survey, maternal deaths per 100,000 inhabitants totalled 73.84, and there were 685.68 physicians and 584.63 in-patient hospital beds per 100,000 inhabitants. The average life expectancy of new-born residents in Almaty was 71.97 years for the period 2017-2021, indicating strong performance.

**Education**

The education sub-area of Almaty boasts of a strong overall performance, with 100 per cent of primary and secondary school-aged children enrolled in public or private schools, and 98 per cent of students have access to classroom ICT facilities. However, the city’s higher education attainment of 33,000 higher education degrees per 100,000 inhabitants and adult literacy rate at 73.4 per cent at the time of the survey are only moderately scored.

**Safety**

According to the analysis of KPI data, Almaty showed moderate overall performance in the safety sub-dimension. In the survey year, there were 47.06 violent crimes and 4.79 traffic-related fatalities per 100,000 inhabitants reported. The police service in Almaty scored favourably, with 276.41 police officers per 100,000 inhabitants registered in the city. However, the city’s performance in terms of fire service and emergency services response time was poor, with only 39.51 firefighters per 100,000 inhabitants and an average emergency response time of 9.7 minutes.

In 2022, there were no natural disaster-related deaths reported in 2022. However, nearly a quarter of the population of Almaty, 24.7 per cent, reported living within disaster-prone areas. The city has taken measures to mitigate the risk and vulnerability of these areas by conducting assessments. In 2021, the total economic losses incurred due to disasters were 0.012 per cent of the city’s GDP.

Most of the emergency events in Almaty are due to fires and other man-made events. The COVID-19 pandemic has had a significant impact, with 19,028 cases and 389 deaths in 2020 and 185,776 cases and 2,194 deaths in 2021. According to a study by the United Nations Economic and Social Commission for Asia and the Pacific, “Risk-informed infrastructure planning Central Asia: pilot in Kazakhstan and Kyrgyz Republic,” the Average Annualized Loss (AAL) to the capital stock in Almaty Province was 1.4 per cent, which contributed 36.3 per cent to the total AAL in Kazakhstan.

The risk from flash floods from the rivers of Almaty is a major concern, as the flood protection infrastructure in place is outdated and may not be strong enough to withstand the force of such floods. It was built 50-70 years ago and requires considerable investments for reinforcement. Although monitoring and early warning systems could help save lives, the damages caused by floods could potentially lead to casualties. The flash floods from the Kargaly River in 2015 and 2019 caused severe damage to numerous households in Almaty, emphasizing the need for better disaster preparedness and risk management.

**Culture**

Almaty performed moderately in the culture sub-area, with 1.5 per cent of the city’s operating budget spent on the conservation and protection of natural heritage and culture. However, the city demonstrated weak performance in terms of cultural infrastructure, with only 15.85 reported cultural institutions per 100,000 inhabitants.

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92 The total number of in-patient hospital beds corresponds to moderate city performance relative to the established benchmark.

93 Data corresponds to data obtained during the 2009 Census for Almaty, during which time 31 per cent of all city inhabitants were reported as having obtained at least one higher education degree compared to 36 per cent nationally, according to media reports for Kazakhstan in 2017.


95 For the full text of the study, see https://www.unescap.org/resources/risk-informed-infrastructure-planning-central-asia-pilot-kazakhstan-and-kyrgyz-republic.


V. KPI EVALUATION RESULTS

Social inclusion

Almaty revealed moderate performance within the social inclusion sub-category. The city performed strongly concerning poverty at 5.2 per cent of city inhabitants living below the poverty line and gender income inequality at 0.88 female to male ratio of average hourly earnings in 2021. In terms of income inequality, the performance of Almaty was weak, with a Gini Coefficient of 0.31 in 2021.

According to the Akimat of the City of Almaty, the city’s average hourly earnings by gender, age, types of economic activity and regions, in the city of Almaty in 2021 was KZT 1,572. Hourly earnings for men averaged KZT 1,679 and KZT 1,472 for women. The average USD to KZT rate in 2021 was 431.8.

The city also showed moderate performance in terms of voter participation, with around 30.15 per cent of eligible voters reported as having voted in the 2021 municipal elections. Its performance in the availability of childcare services was also moderate, with 62.51 per cent of pre-school aged children covered by public and private day-care centres at the time of the survey.

Other

Contribution to local food production is significant, with 35 per cent of the food supplied to the city produced within 100 km of the urban area.

Overall, Almaty has made progress in certain areas, but there is still room for improvement in other areas. One such area is disaster preparedness and risk reduction, which could benefit from further attention and investment.

98 According to the Akimat of the City of Almaty, the city’s average hourly earnings by gender, age, types of economic activity and regions; in the city of Almaty in 2021 was KZT 1,572. Hourly earnings for men averaged KZT 1,679 and KZT 1,472 for women. The average USD to KZT rate in 2021 was 431.8.


VI. RECOMMENDATIONS

Urban policy and governance framework

The City Government of Almaty is presented with recommendations which aim to address the main areas of concern and relevant issues that emerged from the evaluation of Almaty based on the KPIs for SSC. The City Government is invited to consider the recommendations.

Urban planning

Almaty faces multiple urban challenges, including urban sprawl, unaffordable housing, traffic congestion and air pollution. To address these issues, Almaty has introduced a new urban planning approach, including the Master Plan of Almaty until 2040 based on the concept of comfortable compact living with human-scale neighbourhood development. To further improve urban planning, it is recommended to:

1. Strengthen the capacities of relevant departments of the City Government and respective institutions for the implementation of ongoing sectoral programmes (short and medium-term).

2. Empower the City Government and relevant departments and institutions to enable participatory and intersectoral approaches to implementation of the newly adopted Master Plan of Almaty by 2040 (short and medium-term) through:
   a) Establishing regular dialogue among authorities, developers and stakeholders to communicate the concept, scope and objectives of the Almaty Master Plan by 2040;
   b) Developing a comprehensive stakeholder participation plan for the Master Plan to engage the inhabitants, especially representatives of vulnerable groups (women, disabled, migrants etc.);
   c) Connecting the city-level spatial planning with the planning at the district and area level;
   d) Promoting research support to the implementation of the Master Plan through launching programmes at universities in cooperation with the research institute “Almatymasterplan”, which was tasked to organize the implementation of the Almaty Master Plan by 2040.

Financial framework

The national government of Kazakhstan provides institutional support to promote investments in the economy of the city. For this purpose, the socio-entrepreneurial corporation Kazakh Invest provides business support and implements the ‘one-stop shop’ principle for domestic and foreign entrepreneurs and investors to attract investments. The Almaty City Government also established a joint stock company “Almaty” to promote investments and support entrepreneurship. Moreover, Kazakhstan has a sufficient legal framework to support public-private partnerships, and a Regional PPP Centre already operates in Almaty.

Therefore, to enhance the volume and quality of attracted investments, improving the institutional framework for FDIs is recommended. This can be done through the support of the City Government and the Regional Almaty Centre on Public-Private Partnership to strengthen the capacities of current regional and city-level institutions for investment attraction, including the Almaty PPP Centre (medium-term).

Urban mobility

With nearly half a million motor vehicles travelling through the city everyday, Almaty faces a significant transportation challenge. The situation is further compounded by vehicles entering the city from outside, adding to the already congested transportation system. Almaty has been taking steps to improve urban mobility by constructing various transport infrastructures. To address the negative consequences of traffic congestion, several measures are recommended:
1. Decrease air pollution from the motor vehicle fleet in Almaty by:
   a) Adopting temporary solutions during peak pollution periods, such as limiting the driving days for cars using the odd-even license plates scheme, making public transport free during these periods, and restricting the circulation of old and polluting cars from the city centre (short-term);
   b) Incentivizing car owners to switch to cleaner fuels like natural gas or electric propulsion. Economic incentives can also help facilitate the renewal of the car fleet (short-term).

2. The city should also consider:
   a) Deploying intelligent transportation systems;
   b) Ensuring reliable public transport systems;
   c) Promoting non-motorized mobility;
   d) Enforcing environmental considerations in urban spatial planning - proactively consider the characteristics of the sites to develop, such as prevailing winds and morphology and the possible effects of the localization of future built-up volumes, to maximize the exploitation of natural light and avoid drawbacks such as street canyons determined by the buildings’ height (mid and long-term).

Housing

The city implements various programmes to provide affordable housing to vulnerable groups. However, there are still many challenges in providing affordable and decent housing due to a large portion of the housing stock being outdated and needing refurbishment. In addition, there is a high demand for affordable rental accommodation due to internal migration, which has not been addressed yet. To tackle the housing needs of Almaty, the city need to take a comprehensive approach that integrates the requirements of the Almaty Master Plan by 2040 and the needs of the city’s older neighbourhoods. This approach includes:

1. Carrying out inventory work on old residential buildings and taking steps to protect the interests of socially vulnerable populations, with a focus on integrating a gender dimension (short-term);
2. Developing new housing standards that align with the requirements of the new Master Plan of Almaty by 2040, especially concerning polycentres (medium-term);
3. Creating a programme for better municipal management and self-governance in the housing sector, which may consider a diversified range of service providers and better customer relationship management and maintenance of the housing stock (long-term);
4. Establishing a sustainable community management programme for micro districts that emphasizes co-governance, sustainable utilities and municipal solid waste management - this programme should prioritize making the city and neighbourhoods greener, reducing air pollution and promoting energy-saving and efficiency practices (long-term).

Energy

The current state of energy production in Almaty needs improvement and diversification. At present, only 5.1 per cent of energy is generated from renewable sources. This is low considering that the city’s electricity consumption is high, averaging approximately 650 kilowatts (kWh) per capita annually. The energy efficiency of buildings in the city is also low. The total thermal energy consumption per capita in Almaty is quite high at 10.21 gigajoules (Gj) per year.

To increase energy efficiency, it is recommended to:

1. Explore opportunities for switching from direct gas supply to secondary energy sources. This may entail replacing or rehabilitating obsolete supply infrastructure and enforcing cost-reflective regulation of retail tariffs. Consumers should be made aware of the actual cost of energy to encourage them to save energy.
2. Implement clear regulatory measures for heat supply to public buildings and housing funds under the Law on Energy Saving and Increase of Energy Efficiency.\textsuperscript{101}

\textbf{Air pollution}

It is important to prioritize addressing air pollution in urban areas, especially in and around Almaty (see the section on urban mobility). To achieve this, the following are recommended:

1. Enhance the capacity for urban environmental monitoring and management. This includes strengthening the network and improving the abilities of ambient air quality monitoring, managing the levels of harmful pollution to ensure public safety and conducting a detailed study of the population’s health status (short-term).

2. Focus on improving air quality through the following:
   a) Provide incentives for cleaner production and the installation of air pollution prevention technologies.
   b) Support the analysis of industrial emissions and urban developments such as traffic and heating by oblast and other local authorities and include measures for reducing air pollution in their air quality plans and programmes.
   c) Encourage oblasts and other local authorities to create plans and that include ways to reduce and prevent exceeding air quality standards (medium-term).

\textbf{Green and open spaces}

The preservation of green spaces is crucial for the well-being and sustainability of a city. A great initiative taken by the city government towards this cause is the Green Space Development Strategy 2030. It is further recommended to:

1. Preserve and promote green spaces in urban areas, especially in older residential areas in the city centre (short-term).

2. Integrate urban forestry practices in Almaty through awareness-raising and capacity-building initiatives among local authorities, institutions and communities (short-term).


\textbf{Urban water management and blue spaces}

The Almaty Development Strategy 2050 includes important activities aimed at the preservation of green and blue spaces, including through the planned creation of a “green” river corridor crossing the city from foothills to lowlands and supportive natural ventilation of the city. As the city is growing fast, including through the internal migration of the population, there are needs in the future development of the water management system. It is recommended to:

1. Prioritize the rehabilitation and conversion of riversides in Almaty into recreational zones. This will not only extend the area of blue spaces but also potentially rehabilitate the banks of the manmade/irrigation infrastructure in the city (medium-term).

2. Review and assess causes of the poor functioning of the rainwater drainage network and infrastructure in the city (short-term).

3. Take measures to assess and reinforce natural drainage on sub-mountainous parts of Almaty to prevent small-scale landslides and flash floods. This includes exploring the opportunity for integrating watershed management practices in the city, which could also help to manage the street waste waters (medium-term).

4. Elaborate and further implement the Programme on Improved Water Supply and Sanitation for the period beyond 2025. This includes further rehabilitation of water transportation and its end use in order to reduce transportation water losses (short-term).

5. Continue the practice of water metering and its digitalization (medium-term).

Waste management

The Almaty City Development Programme until 2025 and medium-term prospects until 2030 aims to improve the waste management system in Almaty by providing the population with services for the collection of solid waste and creating the necessary infrastructure for waste collection. The programme also aims to increase waste recycling by 30-40 per cent by the end of 2030. To achieve this, it is recommended to:

1. Undertake specialized studies on the lifecycle of the main components of municipal solid waste in Almaty. Elaborate and propose long-term measures for improvement of the municipal waste management in Almaty (short-term).

2. Design and run a mass awareness-raising campaign among the population on household waste separation, recycling and management. This will help people understand the importance of waste management and encourage them to take responsibility for their own waste (medium-term).

3. Design, justify and elaborate a long-term sustainable waste management vision and strategy for Almaty. This will guide efforts to reduce waste, increase recycling and create a cleaner, healthier environment for all Almaty residents (long-term).

Quality of construction, urban infrastructure and utility services

1. To ensure the safety of buildings, it is important to consider the seismic activity in the region. The city can learn from recent earthquakes in neighbouring countries, such as Turkiye and Syria, to design buildings use appropriate construction materials and take into account the spacing of streets and infrastructure (short-term).

2. To improve the overall quality of construction and urban infrastructure development, the city should look into advanced urban planning practices and concepts like smart sustainable cities and new standards for urban housing and infrastructure (medium-term).

3. To further improve utility services, of the city, particularly in terms of customer relationships, billing and encouraging customers to save on their usage (long-term).

Monitoring and evaluation framework for strategic planning

Despite some progress in implementing development programmes and setting target indicators, more could be done to improve data availability at the city level in Almaty. The Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan has made progress in producing available data, but there is still significant space for improvement. Efforts need to be made to improve resource use in the city, which could help trace product lifecycle chains and provide proper waste management and environmental statistics on water use, sanitation, urban land use and infrastructure.

The Bureau of Statistics and other institutions are needed to collect and provide the city with data on the following indicators:

Economy dimension

- Water Supply ICT Monitoring
- Drainage/Storm Water System ICT Monitoring
- Traffic Monitoring

Environment dimension

- Wastewater Treatment
- Solid waste management and treatment.
**SOURCES**


__________ (2022). Investment Programme for 2020-2024. Available at http://almatysu.kz/wp-content/uploads/2020/01/%D0%A3%D1%82%D0%BD%D0%BC%D0%BC%D0%B4%D0%BB%D0%BD%D0%B0%D1%82%D0%BD%D0%BD%D0%B8%D0%BD%D1%8F-%D0%96%D0%9F-%D0%92%D0%A1-%D1%80%D1%83%D1%81.pdf.


SMART SUSTAINABLE CITIES PROFILE  ALMATY, KAZAKHSTAN


SOURCES


Legal references:


Order of the Department of the Committee for the Regulation of Natural Monopolies of the Ministry of National


Order of the Minister of Health of the Republic of Kazakhstan No. 26 of 20 February 2023 “On approval of the Sanitary Rules ‘Sanitary and epidemiological requirements for water sources, places of water intake for household and drinking purposes, household and drinking water supply and places of cultural and domestic water use and the safety of water bodies’” (https://adilet.zan.kz/rus/docs/V2300031934#z18).

List of interviewees

- Department of Digitalization
- Department of Urban Planning
- Department of Environment
- Department of Water supply
- Department of Energy and Energy Companies
- Department of Housing Construction
- Department of Development of Communal Infrastructure
- Department of Mobility
- Department of Green Economy

All interviews were carried out in person during the UNECE mission to Almaty in November 2022.


**ANNEX 1**

**SUMMARY OF NATIONAL-LEVEL STRATEGY PLANNING DOCUMENTS OF THE REPUBLIC OF KAZAKHSTAN ACCORDING TO YEAR OF ISSUANCE AND EXPIRATION (2022)**

<table>
<thead>
<tr>
<th>Policy</th>
<th>Year of issuance</th>
<th>Expiry date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Code</td>
<td>2007</td>
<td>2021 New Reduction</td>
</tr>
<tr>
<td><strong>Strategy Kazakhstan 2050</strong></td>
<td>2012</td>
<td>2050</td>
</tr>
<tr>
<td><strong>Concept for Transition of the Republic of Kazakhstan to Green Economy</strong></td>
<td>2013</td>
<td>2050</td>
</tr>
<tr>
<td><strong>Action plan for the implementation of the Concept for transition of Kazakhstan to Green Economy 2021-2030</strong></td>
<td>2020</td>
<td>2030</td>
</tr>
<tr>
<td><strong>Forecast scheme of territorial and spatial development of Kazakhstan</strong></td>
<td>2019</td>
<td>2030</td>
</tr>
<tr>
<td><strong>State programme of regional development</strong></td>
<td>2019</td>
<td>2025</td>
</tr>
<tr>
<td><strong>National project for the development of entrepreneurship</strong></td>
<td>2021</td>
<td>2025</td>
</tr>
<tr>
<td><strong>National Project Zhasyl Kazakhstan</strong></td>
<td>2021</td>
<td>2025</td>
</tr>
<tr>
<td><strong>National project “Quality and affordable healthcare for every citizen” Healthy Nation</strong></td>
<td>2021</td>
<td>2025</td>
</tr>
<tr>
<td><strong>National project “Quality Education, Educated Nation”</strong></td>
<td>2021</td>
<td>2025</td>
</tr>
<tr>
<td><strong>National project “Technological breakthrough through digitalization, science and innovation”</strong></td>
<td>2021</td>
<td>2025</td>
</tr>
<tr>
<td><strong>National project “Strong regions - the driver of the country’s development”</strong></td>
<td>2021</td>
<td>2025</td>
</tr>
<tr>
<td><strong>National project “Sustainable economic growth aimed at improving the welfare of Kazakhstanis”</strong></td>
<td>2021</td>
<td>2025</td>
</tr>
<tr>
<td><strong>National project for the development of the agro-industrial complex</strong></td>
<td>2021</td>
<td>2025</td>
</tr>
<tr>
<td><strong>National project “Safe country”</strong></td>
<td>2021</td>
<td>2025</td>
</tr>
<tr>
<td><strong>National Program Nurly-Zher 2020-2025</strong></td>
<td>2019</td>
<td>2025</td>
</tr>
<tr>
<td><strong>State program of business support and development “Business Roadmap-2025”</strong></td>
<td>2019</td>
<td>2025</td>
</tr>
<tr>
<td><strong>Interregional scheme of territorial development of Almaty agglomeration</strong></td>
<td>2016</td>
<td>2035</td>
</tr>
<tr>
<td><strong>Interregional Action Plan for the development of the Almaty agglomeration</strong></td>
<td>2020</td>
<td>2030</td>
</tr>
</tbody>
</table>
## ANNEX 2
### OVERVIEW OF LOCAL PLANS, PROGRAMMES AND STRATEGIES FOR ALMATY

<table>
<thead>
<tr>
<th>Areas</th>
<th>Plans, programmes, and strategies</th>
<th>Objectives</th>
<th>Policy measures</th>
</tr>
</thead>
</table>
| Policy framework and governance | Almaty Development Strategy 2050 | • Effective city management                                                 | • Improve the quality of urban planning through transparency and open access to data, allowing informed decision making using smart city technologies  
• Reducing the share of state participation in the management of municipal assets and the economy of the city, and bringing the share of state participation in the competitive environment to the level of OECD countries  
• Increase the "Participation Budget" by at least 10 times  
• Polycentric model development  
• Effective management of existing assets, as well as high-level involvement of citizens in decision-making processes and public consensus  
• Management of city assets based on the principles of maximizing socio-economic return while minimizing risks to the society and the environment  
• Application of best practices to improve the transparency and efficiency of budget expenditures and transfer of advanced technologies, and attract private financing  
• Transfer of management of state assets to a competitive environment in areas where the private sector can operate  
• City development based on initiatives and proposals of citizens  
• Creation of an urban crowdsourcing platform to involve citizens in the implementation of urban tasks. |
|                        |                                    | Institutional structure for GCAP coordination and implementation of 5 financed projects in the first 3 years | • Akimat Office for Green Project Implementation |
|                        |                                    | • Reduce car trips up to 20%                                                | • Development of transport links between the city and suburbs (electric trains and light rail transit - LRT)  
• Infrastructural development of city outskirts, with easy access to public transport  
• Development of smart transport system to optimally distribute traffic flows  
• Awareness-raising campaigns  
• Creation of car-free or low-emission zones  
• Phase out of diesel vehicles  
• Development of green and energy-efficient public transport. |

Green City Action Plan for the city of Almaty and Institutional structure for GCAP coordination and implementation of 5 financed projects in the first 3 years.
<table>
<thead>
<tr>
<th>Areas</th>
<th>Plans, programmes, and strategies</th>
<th>Objectives</th>
<th>Policy measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban mobility (continued)</td>
<td>Almaty City Development Program until 2025 and medium-term prospects until 2030</td>
<td>- Creation of a modern public transport system connecting the urban and suburbs areas&lt;br&gt;- Encourage residents and visitors of the city to use public transport</td>
<td>- Optimization of the route network&lt;br&gt;- Implementation of a new tariff policy for urban and suburban routes&lt;br&gt;- Implementation of Vision Zero in the development of design and documentation for projects in the field of road transport infrastructure, road network, etc., adapting the necessary regulatory legal acts&lt;br&gt;- Use of a unified transport model for the Almaty agglomeration for purposes of urban and transport planning&lt;br&gt;- Strengthen technical and human resources&lt;br&gt;- Creation of a link between the amount of subsidies and quality of service and improvement the stability of the conditions for attracting private investment in public transport&lt;br&gt;- Improve the system of regulation of taxi services and expand the practice for application in electric transport&lt;br&gt;- Renewal of public transport stock and its conversion to an ecological type of fuel by the end of 2025 - conversion of municipal and special equipment to compressed natural gas (methane) and electric traction&lt;br&gt;- Promote transport sharing services through improved regulation and creation of an appropriate infrastructure&lt;br&gt;- Creation of a single traffic management centre&lt;br&gt;- Introduction of a permit system “electronic waybill” for managing traffic in the city&lt;br&gt;- 40-km dedicated lanes for priority public transport&lt;br&gt;- Convert 1,200 units diesel buses into gas and electric traction&lt;br&gt;- Update of the trolleybus fleet (200 units)&lt;br&gt;- Commissioning of 2 new car parks and 5 new filling stations&lt;br&gt;- Development of charging infrastructure networks for public and private electric transport&lt;br&gt;- Introduction of 3 new modern depots for electric buses&lt;br&gt;- Installation of at least 200 modern bus stations in different districts of the city&lt;br&gt;- By 2027, put into operation the first high-speed light rail&lt;br&gt;- Introduction of additional 125 km bike paths and lanes&lt;br&gt;- Launch of 30 new main suburban routes, ensuring connection with the existing 22 routes and new transport hubs in all directions.</td>
</tr>
</tbody>
</table>
### Urban mobility

#### Comprehensive Plan New Almaty

- Development of infrastructure and improvement of the quality of life of the population

- **Policy measures**
  - Road construction in 51 microdistricts
  - Reconstruction of the road network
  - Construction of transport interchanges and U-turn overpasses.

#### Municipal Energy Efficiency Plan for the city of Almaty

- **Objectives**
  - Extend and improve public transport services in Almaty City
  - Transport modal shift from private to public transport

- **Investment measures:** Energy Efficiency Investment Program
  - Priority 3. Investments in public transport (9 EE measures including LED Metro lighting and escalator system, conversion of diesel buses to CNG, extension of bike renting system, traffic flow optimization, among others)
  - Priority 8: Investments in private transport (3 measures including enforcement of vehicle emissions standards, empower technical inspectors, service stations, penalty system for non-compliance; increase attractiveness of low emission vehicles: development of vehicle charging infrastructure, investments in electric, LPG and CNG vehicles; and car parking management and restraint measures in city centre and inspection service).

#### Green City Action Plan

- **Objectives**
  - Coverage of the transport needs in the suburbs
  - Increase number of public transport users
  - Increase the share of shared mobility and increase the share of electric mobility
  - Increase traffic safety
  - Reduce private cars in the city centre

- **Policy measures**
  - Developing a high-performance public transport network
  - Transit Oriented Development (TOD): applying TOD in satellite city development
  - Connecting different transport modes: multimodal hubs
  - Increasing the visibility of school areas in the city
  - Creating enjoyable cycling and walking routes
  - Establishment of low-emission zones.
<table>
<thead>
<tr>
<th>Areas</th>
<th>Plans, programmes, and strategies</th>
<th>Objectives</th>
<th>Policy measures</th>
</tr>
</thead>
</table>
| Housing | Almaty Development Strategy 2050 | Reduce the degree of wear of the city’s water supply networks to 45% | • Optimization of urban development, replacement of dilapidated and low-rise housing, and moving large industrial sites out of the city  
• Introduction of innovative solutions that ensure high rates of construction and low cost of housing  
• Prioritizing the use of energy-efficient technologies in the construction, modernization and operation of facilities  
• Use of rational and reasonable use of utilities in all facilities  
• Smart technologies for collecting and processing utility consumption, using differentiated tariffs  
• Increasing investments in the construction and reconstruction of utility networks to reduce network wear  
• Introducing a system of self-management of residential buildings to ensure transparency in the housing and utilities sector. |
| | Almaty City Development Program until 2025 and medium-term prospects until 2030 | The highest quality standards in the provision of public services | • Introduction of a new tariff policy for housing and communal services on the principle of “tariffs in exchange for investments” with transition to the tariff policy “high consumption = more expensive tariff” by 2025  
• Compensation of utility costs for socially vulnerable segments of the population  
• Construction of 280 km of water supply networks in ten settlements to provide 100% access to centralized water supply in the city by 2026  
• Reconstruction of at least 104 km of water networks annually  
• Gasify 99.4% of Almaty by 2023.  
• Accelerated digitalization and introduction of smart grid technologies to reduce transportation losses and the share of unpaid water in the city’s water supply system by 50%  
• 30 sewage pumping stations built by 2026  
• Increasing the coverage of residents with centralized sanitation to 95% by 2030  
• Modernization of 22 small urban boiler houses by 2026  
• Annual reconstruction of at least 39 km of heating networks  
• Implementation of a programme to improve the energy efficiency of public buildings by 2026, which will increase heat savings by up to 40%  
• Reconstruction of 467 km of electric networks until 2025  
• Implementation of a new software package and modernization of 44,000 LED lamps with SMART system support, with completion in 2026.
### Areas

#### Housing (continued)

<table>
<thead>
<tr>
<th>Plans, programmes, and strategies</th>
<th>Objectives</th>
<th>Policy measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive Plan New Almaty</td>
<td>Development of infrastructure and improvement of the quality of life of the population</td>
<td>• Construction of water supply and sanitation networks in 7 districts of the city</td>
</tr>
</tbody>
</table>
| Green City Action Plan for the city of Almaty | Increased resources use efficiency | • Energy Efficiency Programme for public buildings and facilities  
• Residential buildings retrofit programme  
• Almaty CHP-2 modernisation  
• Rehabilitation and modernisation of the District Heating (DH) infrastructure  
• Heat pumps and solar heating programme for residential buildings in areas not connected to DH  
• Development of the Almaty Smart Grid Programme and pilot project implementation  
• Developing a leakage reduction programme for drinking water supply  
• Wastewater (WW) collector retrofit  
• Feasibility study on WWTP modernisation and industrial WW treatment options. |
<table>
<thead>
<tr>
<th>Areas</th>
<th>Plans, programmes, and strategies</th>
<th>Objectives</th>
<th>Policy measures</th>
</tr>
</thead>
</table>
| Housing (continued) | Municipal Energy Efficiency Plan for the city of Almaty | To reduce energy consumption, diminish related expenditures from the municipal budget, and improve municipal service delivery for city residents | **Investment measures:**

**Energy Efficiency Investment Program**

- Priority 1: Investments in District Heating (10 measures including automation of DH distribution and improved heat metering and implementation of SCADA; rehabilitation/replacement of DH pumping stations; DH network maintenance and upgrade programme, pipeline insulation, regulation and balancing; conversion of 100 autonomous boilers (coal, power, mazut) at public facilities to efficient gas fired boilers, etc.)
- Priority 2: Investments in municipal public buildings (7 measures including EE Retrofit Programme of municipal schools; solar hot water programme for education and medical facilities; Building Energy Management Systems (BEMS) for large buildings (> 20,000 m²), etc.)
- Priority 5: Investments in potable water and wastewater (9 measures including improvement of efficiency of pumps and motors in the water supply system; active leak detection and pressure management programme; support programme for residential users for water-efficient fixtures and fittings; retrofit of WW Treatment Plant; biogas production from WW sludge at WWTP, etc.)
- Priority 7: Investments in residential buildings (5 measures including implementation of individual automated heating stations (IHS) in the multi-store residential buildings; installation of individual heat metres in all apartments and introducing consumption-based billing; replacement of elevator equipment; retrofit of residential multi-store buildings; and solar rooftop for residential buildings)

**Non-investment measures and policies:**

- A benchmark analysis on energy consumption and energy audit program for all buildings
- Capacity-building programme for the technical staff operating the facility
- Education and behavioural change training for employees/users of municipal buildings
- Introduction of green public procurement criteria for energy appliances in public buildings
- Certification scheme for buildings.
<table>
<thead>
<tr>
<th>Areas</th>
<th>Plans, programmes, and strategies</th>
<th>Objectives</th>
<th>Policy measures</th>
</tr>
</thead>
</table>
| Waste         | Almaty Development Strategy 2050                                                                 | Bring recycling of waste up to 80%                                                                    | • Phased introduction of the practice of separate waste collection and reduction of the area for solid waste landfills  
• Minimization of the impact of waste on the environment – converting waste into resources.                                                                 |
|               | Almaty City Development Program until 2025 and medium-term prospects until 2030                 | • Providing the population with services for the collection of solid waste and creating the necessary infrastructure for waste collection  
• Enhance cooperation in the field of solid waste management with the Almaty agglomeration  
• Increase waste recycling by 30-40% by the end of 2030                                                                                                           | • Development of a waste management programme and measures  
• Improvement of waste management rules: introduction of mandatory separate collection of waste into “dry” and “wet”  
• Expansion of the network of recycling collection points through private investment  
• Special sites for the collection of industrial construction waste and for processing them into secondary material resources  
• Together with the Kazakh-Spanish company WasteEnergyKazakhstan LLP, construction of a full-cycle waste processing plant that uses Meriolyis technology (biogas production), as part of the integrated MSW management system in Almaty and Almaty region  
• Implementation of digital tools to encourage residents to collect and transfer waste for recycling  
• Launch of the Green School Project, to increase environmental awareness  
• By 2025, introduce a dispatching system for special equipments of waste collecting organizations equipped with GPS systems  
• By 2027, build a waste incineration plant with a capacity of 500,000 tons of waste per year and electricity generation of 40 MW per year  
• Construction of a plant for the production of alternative fuel from unsorted waste.                                                                                                    |
| Green City    | Environmentally neutral governance of waste management activities and increase of resource efficiency |                                                                                                       | • Development of an Integrated Waste Management Strategy  
• Establishment of a construction and demolition waste recycling facility  
• Feasibility study for the establishment of a biowaste management system and pilot project for green waste composting  
• Feasibility study for upgrading the existing waste sorting plant  
• Implementation of separate waste collection system for dry recyclables.                                                                                                           |
| Action Plan   | for the city of Almaty                                                                          |                                                                                                       |                                                                                                                                                                                                                |
| Municipal     | Improve performance of the solid waste sector in Almaty city                                   |                                                                                                       | Investment measures:  
• Investment package in municipal solid waste (6 measures including conversion of waste collection vehicles to CNG and fuelling infrastructure; bio waste to energy: biogas plant; Landfill Gas Capture Program; Waste-to-Energy Plant, etc.). |
| Energy        | Efficiency Plan for the city of Almaty                                                          |                                                                                                       |                                                                                                                                                                                                                |
### Green and open spaces

**Objectives**
- Bring up the available public green space to 20 m² per person

**Policy measures**
- Creation of a “green network” in the city which will unite the urban ecosystem and support biodiversity
- Upgrade of the city’s green fund
- Creation a new world-class recreational park
- Mountain Cluster Conservation Measures
- Planning the growth of an urban agglomeration according to the principle “not a city grows into mountains, but mountains grow into a city”.

**Program until 2025 and medium-term prospects until 2030**
- Maintain the ecological balance and support biodiversity
- Conservation and development of protected areas

**Policy measures**
- Creation of a sustainable “ecological” framework which will unite the urban ecosystem
- The draft new Rules for the Maintenance and Protection of Green Spaces in the City of Almaty will include norms for the quality of seedlings, watering green spaces, as well as strengthening control over the implementation of compensatory plantings, and the procedure for cutting down trees included in the List of Red Book Plants
- Creation of 2 plant nurseries with an area of about 30 hectares in the city
- Preservation and further sustainable development of the green fund of the city - plant 1.2 million trees by 2025 and about 1.3 million by 2030
- To improve the green fund, pest control of green spaces will be strengthened with an increase in cultivated areas (based on biological, chemical methods)
- Introduce drip irrigation for watering green spaces and eco paths
- Adjustment of the general development plan, taking into account the wind regime
- Granting entry to protected areas only to environmentally friendly means of transport.

### Green City Action Plan for the city of Almaty

**Objectives**
- Double the available public green space per person (up to 10m² / person) by 2030
- Include the rivers and their embankments in recreational park areas

**Policy measures**
- Development of a city-wide Blue and Green Strategy and Implementation Plan
- Implementing priority blue and green infrastructure projects at the district level.
## Areas

<table>
<thead>
<tr>
<th>Areas</th>
<th>Plans, programmes, and strategies</th>
<th>Objectives</th>
<th>Policy measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban water management and blue spaces</td>
<td>Almaty Development Strategy 2050</td>
<td>Sustainable preservation of the ecological balance</td>
<td>• Creation of a “green” river corridor crossing the city from the foothills to the lowlands and supportive natural ventilation.</td>
</tr>
<tr>
<td>Program until 2025 and medium-term prospects until 2030</td>
<td>• Improving the condition of small rivers and reservoirs</td>
<td>• Flooding elimination</td>
<td>• Carrying out work on the restoration, cleaning, dredging, bank protection and landscaping of adjacent water protection zones 7 reservoirs, 26 irrigation canals, 30 km of rivers and streams by 2025; by 2030, restoration and cleaning of 21 reservoirs, 20 irrigation canals and 50 km of rivers and streams • Reconstruction of 276 km of canal networks and storm sewers; construction of 100 km of new canal networks and restoration of 25 km of storm sewers • Reconstruction and construction of 27 water intake facilities – 15 new construction and 12 reconstructions.</td>
</tr>
<tr>
<td>Green City Action Plan for the city of Almaty</td>
<td>Improve city resilience to flood risks and other climate-related pressures</td>
<td>• Development of a water-saving plan • Increasing the water permeability • Preventing and mitigating landslide situations • Awareness-raising and education centre for landslide prevention.</td>
<td></td>
</tr>
</tbody>
</table>
## ANNEX 3

**KEY PERFORMANCE INDICATORS THAT SCORED BELOW 25 PER CENT OF TARGET VALUE**

<table>
<thead>
<tr>
<th>Category</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air quality</td>
<td>Air pollution</td>
</tr>
<tr>
<td></td>
<td>GHG emissions</td>
</tr>
<tr>
<td>Energy</td>
<td>Renewable energy consumption</td>
</tr>
<tr>
<td></td>
<td>Electricity consumption</td>
</tr>
<tr>
<td></td>
<td>Public building energy consumption</td>
</tr>
<tr>
<td>Culture</td>
<td>Cultural infrastructure</td>
</tr>
<tr>
<td>Employment</td>
<td>Unemployment rate</td>
</tr>
<tr>
<td>Safety</td>
<td>Emergency service response time</td>
</tr>
<tr>
<td></td>
<td>Fire service</td>
</tr>
<tr>
<td>Social inclusion</td>
<td>Gini coefficient</td>
</tr>
<tr>
<td>Buildings</td>
<td>Public building sustainability</td>
</tr>
<tr>
<td>Electricity support</td>
<td>Demand response penetration</td>
</tr>
<tr>
<td></td>
<td>Electricity supply ICT monitoring</td>
</tr>
<tr>
<td></td>
<td>Electricity system outage frequency</td>
</tr>
<tr>
<td></td>
<td>Electricity system outage time</td>
</tr>
<tr>
<td>Innovation</td>
<td>Patents</td>
</tr>
<tr>
<td></td>
<td>R&amp;D expenditure</td>
</tr>
<tr>
<td>Transport</td>
<td>Dynamic public transport information</td>
</tr>
<tr>
<td></td>
<td>Intersection control</td>
</tr>
<tr>
<td></td>
<td>Low-carbon emission passenger vehicles</td>
</tr>
<tr>
<td>Water and sanitation</td>
<td>Smart water meters</td>
</tr>
<tr>
<td></td>
<td>Solid Waste Treatment</td>
</tr>
</tbody>
</table>

Almaty has demonstrated significant progress in diverse areas, including business, economy, culture and education, in Kazakhstan. The city has set its sights on becoming one of the leading smart and sustainable cities in the world. Since gaining independence, Almaty, alongside the nation’s capital, Astana, has made remarkable strides in realizing the Sustainable Development Goals of the 2030 Agenda for Sustainable Development.

Despite the favourable economic and demographic conditions, Almaty still faces several challenges. Air quality and pollutant emissions remain a significant concern, with official government sources differing from independent assessments. Additionally, the city is grappling with the challenges of renewable energy sources and electricity consumption.

To help address these challenges, the Almaty City Government requested the United Nations Economic Commission for Europe (UNECE) to develop a Smart Sustainable City Profile. The study is based on an evaluation of the performance of Almaty using the Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC), a public and freely available standard developed by the United Nations Economic Commission for Europe (UNECE) and the International Telecommunication Union (ITU) under the United for Smart Sustainable Cities (U4SSC) initiative.

The Smart Sustainable City Profile offers practical recommendations for upscaling development and sustainability efforts in different areas. These recommendations were developed in consultation with local and national authorities and will inform the work of UNECE in supporting the ambitious vision of Almaty. The Almaty City Profile recommendations suggest short-term measures and mid to long-term solutions to help achieve sustainable development in the city.

To learn more about the work of UNECE on urban development, housing and land management, please visit www.unece.org/housing.