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BENCHMARKING BEST PRACTICES OF TOP-RANKED CITIES FOR HIGH LIVABILITY AND CITIZEN PARTICIPATION

Abstract

This article presents a comparative analysis of international benchmarking systems and their application to assessing urban livability and citizen engagement. The research examines key global indices – Economist Intelligence Unit (EIU), Mercer, PwC, TUWIEN Smart City Model, MIT Treepedia, and the National League of Cities (NLC) – to identify dominant trends and classification models of city benchmarking. Four major types of benchmarking practices were defined: multi-factor indices, single-indicator rankings, thematic analytical reviews, and diagnostic metrics. An empirical case study of Almaty, Kazakhstan, demonstrates the adaptation of international practices to the local context. Between 2020 and 2023, over 1,500 participatory projects were implemented under the Participatory Budget program, primarily in urban greening, infrastructure, and public safety. The findings show that digital governance platforms (Open Almaty, iKomek, Almaty Urban Center) enhance civic participation but remain limited by unequal digital access. The study concludes that benchmarking serves as an effective governance and evaluation tool for improving urban livability and inclusiveness. The Almaty case illustrates the potential of combining global best practices, data-driven governance, and participatory approaches to foster sustainable urban transformation.

Keywords: city benchmarking, livability, citizen participation, smart city, sustainability, digital governance, digital services.

Introduction

With the development of technology and artificial intelligence, methods for assessing the comfort of living in an urban environment are becoming more accurate and diverse. In these conditions, issues of ensuring a comfortable urban environment and public participation in governance are becoming a

priority for local authorities, researchers, and residents themselves. The emergence of global indices and rankings, such as the Global Liveability Index from the Economist Intelligence Unit, the Quality of Living index from Mercer, and the Smart City Index, has intensified the desire of cities not only to improve their internal indicators but also to compete for positions in international comparisons. City rankings are interpreted as benchmark assessments and represent a comparative analysis based on benchmark indicators.

Benchmarking, as a tool for analyzing and comparing urban strategies, has become widespread in urban planning practice. It allows for the identification of best practices, the adaptation of successful models, and the assessment of progress in key areas: infrastructure, digitalization, environmental sustainability, and social inclusion. Alongside this, the importance of citizen involvement in decision-making processes is growing, especially through digital interaction mechanisms.

For Kazakhstan, these issues are particularly relevant in the context of modernizing urban management and transitioning to the principles of a «smart city.» This article examines international approaches to assessing the quality of the urban environment and citizen participation, and also presents an empirical case study of the city of Almaty as an example of the local adaptation of global practices. It analyzes how the city applies benchmarking tools, implements digital services, and develops feedback mechanisms with the population to improve the quality of life and form an inclusive urban policy.

Materials and methods

Benchmarking is interpreted as a tool for comparative assessment of urban efficiency. More than 500 urban indices are actively used in policy and academic practice [1]. The works analyze digital technologies as a means of increasing citizen participation [2–4]. The most common are multi-factor indices that take into account a combination of parameters related to sustainability and quality of life. Local studies in Kazakhstan emphasize the importance of institutional conditions for the successful localization of global practices [5, 6].

The study uses a mixed approach: theoretical analysis of international indices as EIU, Mercer, GVI, etc., a comparative review of benchmarking methodologies, and a case study of the city of Almaty. Empirical data on Almaty includes an analysis of «Participatory Budget» projects, digitalization initiatives, and environmental transformations of the urban environment during the period 2020–2023 [17].

Modern approaches to urban benchmarking and its applied significance

The comfort of the urban environment is a key category of modern urban planning. The report defines comfort as the integration of infrastructure solutions, housing accessibility, ecology, and the quality of public spaces [7].

Big data, «smart» city technologies, GIS, and crowdsourcing provide new opportunities for urban planners and authorities to create more comfortable living conditions. The use of this knowledge base is necessary for smart management. However, to fully realize these opportunities, it is necessary to improve data accessibility and develop analytical tools that will consider the individual needs of each city. Data analytics, along with a flexible and futuristic strategy, should play a very important role in the formation and development of a metropolis. The participation of local communities in these processes is the basis of their management in smart cities. The National League of Cities (NLC) report presents the concept of «livable communities.»

The literature review presents the following types of benchmarking (see Table 1):

1. Indices and index reports: These are publicly available multi-factor assessment schemes that rank cities from best to worst based on a comprehensive assessment of several interrelated dimensions. Examples include the Economist Intelligence Unit index, the Z-Yen Global Financial Centres Index, and the Sportcal Global Sports Cities Index. They account for approximately 64% of all benchmarks and are widely used for strategic planning, comparative analysis, and positioning cities on the international stage [10].

2. Rankings based on a single indicator: These record the performance of each city, usually from best to worst, based on a single indicator. Examples include the Rome2Rio Global Connectivity Ranking (direct international flights) and the IQAir Air Quality and City Pollution Ranking (particulate matter density). They account for approximately 23% of the total number of benchmarks. They are easy to interpret but do not provide a comprehensive picture of the quality of life [11].

3. Less common are analytical reviews and thematic reports. These reports assess the performance and readiness of cities on specific urban themes. They are less visible, may require a subscription, and contain comparative components as an additional layer of analysis rather than the main focus. They may group or typologize cities instead of strictly ranking them. They represent 9% of benchmarks, are valuable for their depth of analysis, and are used by specialists in developing urban policy programs Best Performing Cities 2024, World Best Cities Report 2024 [12, 13].

4. Measurement metrics: These consider a city's performance in one specific dimension, usually based on a single or primary data point. They are the least common, accounting for 4% of the indicators. Such metrics serve as diagnostic tools for monitoring the effectiveness of individual areas of urban infrastructure (for example, energy efficiency or accessibility of public transport) Resilient Cities Index 2023 [14].

Table 1 – Types of Comparative Analysis and Their Practical Application

No.	Type of Comparative Analysis	Characteristics and Content	Examples	Percentage share	Practical Purpose
1	Indices and Index Reports	Multifactorial complex assessment schemes that rank cities based on a combination of indicators: economy, environment, safety, culture.	Economist Intelligence Unit, Z-Yen Global Financial Centers Index, Sportcal Global Sports Cities Index	≈64%	Strategic planning, diagnosis of strengths and weaknesses, intercity comparisons.
2	Rankings based on a single indicator	Measure performance based on one factor (transport, pollution, cost of living, etc.).	Rome2Rio Global Connectivity, IQAir Air Quality Ranking	≈23%	Monitoring of individual aspects of the urban environment (ecology, transport, etc.).
3	Analytical reviews and thematic reports	Studies of groups of cities with elements of comparison and typification. Often limited access.	Urban Sustainability Reports, City Readiness Reports	≈9%	Assessment of cities' readiness for innovation and sustainable development.
4	Evaluation measures (metrics)	Assessment of effectiveness based on individual parameters without a final ranking.	Urban Mobility Index, Green View Index (MIT Treepedia)	≈4%	Used as tools for evaluating individual areas of urban policy.

Approximately 20% of all benchmarks are produced by research, analytical, and academic organizations, while in other cases, academics contribute. Notable examples include: The Globalization and World Cities Research Network (GaWC), MIT's Senseable City Lab.

Since 1998, GaWC has mapped and ranked cities based on their «network connectivity,» meticulously studying the centrality of cities based on the concentration of advanced producer services. Their ranking of global cities (alpha, beta, gamma categories) has significantly influenced the strategic plans of local governments, multilateral agencies, and the private sector, demonstrating the ability of academic analysis to inform global urban practice. However, GaWC emphasizes that the ranking is a small part of their model, often oversimplified by the media and politics focused on «best» and «worst» lists.

MIT's Senseable City Lab developed the Green View Index (GVI), later named «Treepedia,» which assesses the greenness of a city using Google Street View panoramas. Its partnership with the World Economic Forum for dissemination attracted significant attention, as cities used its comparative overview to strengthen advocacy for nature-based solutions. The GVI/Treepedia results have undergone academic peer review, and the team provides open access for reproducibility.

In addition, there are benchmarks developed by private organizations, such as the Arup-Rockefeller «Resilience Index» and the PwC «Cities of Opportunity» ranking.

Thus, the presented classification demonstrates that urban benchmarking is gradually evolving from narrowly focused ratings to comprehensive and interdisciplinary management tools, in which digital data, citizen participation, and sustainable development play an increasingly important role.

2.2 Case analysis of improving the comfort of the urban environment and citizen engagement.

In recent years, Almaty has been actively developing approaches to a «human-centered» and sustainable city, using both elements of international experience and local initiatives. Almaty is the largest city in Kazakhstan by population (more than 2 million people), the former capital and a key economic and cultural center of the country. Almaty is actively developing «smart city» components and citizen participation programs. Since 2020, the «People's Participation Budget» mechanism has been introduced, within the framework of which more than 1,500 projects have been implemented [15]. Digital services are also being developed: Open Almaty, iKomek, Almaty Urban Center.

Since 2016, Almaty has been implementing the «Development of a Comfortable Urban Environment» program, within the framework of which the city authorities focus on: the development of pedestrian infrastructure (reconstruction of Panfilov, Zhibek Zholy, and Abay streets); expanding the public transport network and dedicated lanes for buses; the introduction of electric buses and charging stations; improvement of public spaces and parks (Gorky Central Park, district-level squares); greening the city and restoring irrigation canals (surface water drainage system – a unique historical element).

Studies by local urbanists show that the quality of the urban environment in Almaty is improving, especially in the central districts [7, 8]. However, the problem of unevenness remains – in residential areas (Alatau, Nauryzbay districts), the infrastructure lags significantly behind. The «People's Participation Budget» (PPB) allows residents to participate in the distribution of a part of the district budget (more than 11 billion tenge in 2022).

Figure 1 demonstrates the growth in the number of projects implemented within the framework of the PPB. A clear positive trend is visible, reflecting both increased budget funding at the district level and increased awareness and activity among the population. A particularly noticeable increase occurred between 2020 and 2021 – likely due to an intensified information campaign and the digitalization of application submissions.

Data on PPB projects in Almaty for 2020–2023 were collected from open sources: the Open Almaty portal, official reports of the akimats (local administrations), and independent publications of the Urban Forum Kazakhstan [21].

Categories were determined based on the descriptions of applications posted on Open Almaty and reports from district akimats. The conditional distribution of projects by type is shown in Figure 2.

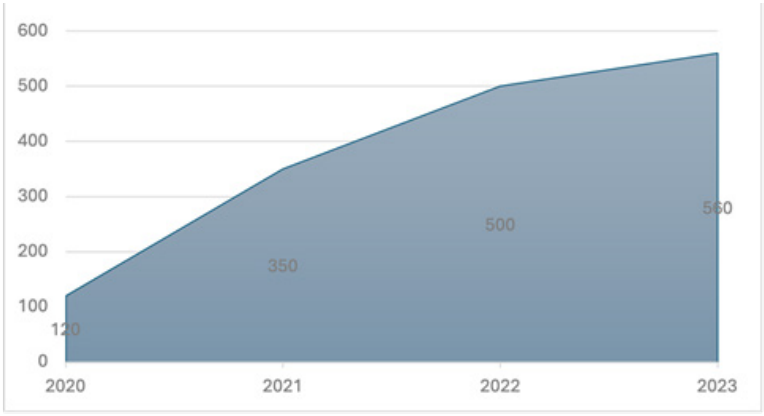

Figure 1 – Dynamics of implemented projects within the framework of the «People's Participation Budget» in Almaty, 2020–2023

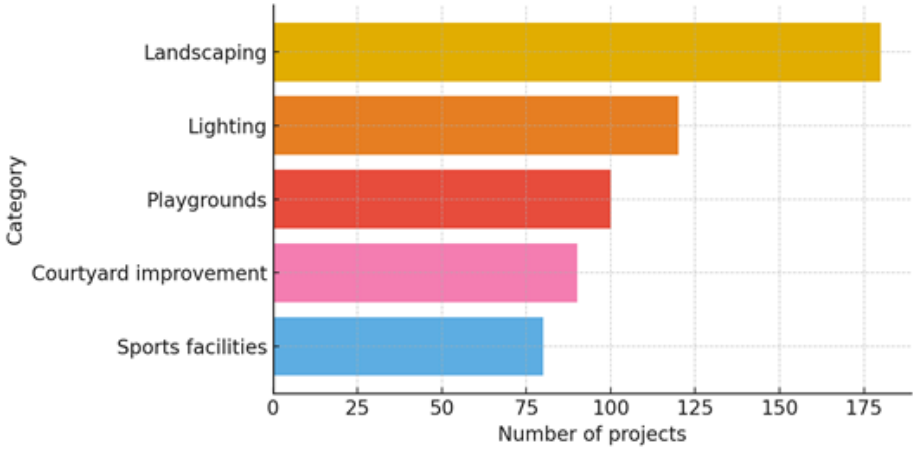

Figure 2 – Distribution of participatory budgeting projects in Almaty by category

The most popular category turned out to be landscaping projects (planting trees, installing flowerbeds, restoring irrigation canals). Lighting and playgrounds also account for a significant share – reflecting the priority of safety and accessible infrastructure in citizens' requests. The share of sports infrastructure is growing as initiatives promoting a healthy lifestyle and urban fitness in residential areas are supported.

The main features to highlight are: the Open Almaty platform is used for submitting initiatives and voting; any resident can submit a beautification project (playground, lighting, landscaping, etc.); decisions are made based on online voting among citizens. Despite a number of advantages, there are challenges. Limited public participation: mainly users aged 30–50 with a high level of digital literacy are active. Insufficient public awareness in areas with low levels of ICT access. Limited project support after implementation (for example, lack of maintenance of small architectural forms and green spaces). Nevertheless, according to the Almaty city administration, more than 1,500 projects have been implemented over the three years of the program, most of which are improvements to residential areas and landscaping [20].

Almaty is actively implementing digital services such as: Open Almaty – a single window for citizens' appeals, suggestions and complaints; iKomek – a system for rapid response to incidents (similar to «SmartCity» platforms in other countries); Almaty Urban Center – an analytical center

engaged in the analysis of the urban environment and public opinion [16–17]. According to a survey by the Urban Forum Kazakhstan, about 47% of surveyed citizens positively assess interaction with the city's digital services, but note a lack of real feedback [18].

The implementation of «green building» principles within the framework of the «Green Almaty» program reflects the city's commitment to sustainable urban development. A key focus has been the expansion of cycling infrastructure, including the construction of dedicated bicycle lanes and the operation of the AlmatyBike bicycle rental system. However, the level of use remains relatively low due to poor route connectivity and limited integration with other modes of transport [19]. Positive steps have also been taken in the area of urban mobility: electric buses have been introduced and an air quality monitoring system has been deployed [20]. Despite these efforts, environmental risks persist – Almaty remains among the most polluted cities in the CIS in terms of PM2.5 particulate matter content, which underscores the need for comprehensive, multi-level measures at the national level [21–23].

Almaty could become a model for other Kazakhstani cities, provided that successful practices are systematically scaled up and citizen involvement in governance processes is expanded. The Almaty case demonstrates that the implementation of digital solutions and public participation through participatory budgeting increase the perception of environmental comfort. However, challenges remain: environmental risks, uneven regional development, and limited involvement of socially vulnerable groups. Compared to Copenhagen, Singapore, and Seoul, Almaty is in the formative stage of urban sustainability and requires a systemic approach.

Results and discussion

The comparative analysis of global city rankings and indices, including the Economist Intelligence Unit (EIU), Mercer, PwC, TUWIEN Smart City Model, Treepedia (MIT), and the National League of Cities (NLC), revealed that modern benchmarking systems are evolving from purely comparative rating tools toward integrated, multi-criteria analytical frameworks. These systems combine quantitative data with qualitative dimensions such as citizen satisfaction, accessibility, and governance transparency.

Trends and classification of city benchmarking

The study identified four main types of benchmarking practices commonly applied in urban governance (Table 2).

Table 2 – Classification of urban benchmarking approaches and their practical application

No.	Type of Benchmarking	Description	Examples	Practical Purpose
1	Multi-factor indices	Comprehensive evaluations integrating economic, environmental, and social parameters	EIU, Mercer, PwC	Strategic planning and diagnostics of strengths and weaknesses
2	Single-indicator rankings	Performance measurement based on a single factor	IQAir, Rome2Rio	Monitoring of specific aspects of urban systems
3	Thematic and analytical reviews	In-depth studies assessing readiness for innovation and sustainability	Milken Institute, Resonance Consultancy	Policy design and benchmarking-based recommendations
4	Metrics and assessment tools	Diagnostic indicators without final ranking outcomes	Treepedia (MIT), Urban Mobility Index	Evaluation of specific domains of urban policy

This typology corresponds with findings that benchmarking has become a strategic governance mechanism, helping cities assess policy outcomes, strengthen accountability, and identify transferable practices [1].

Empirical analysis: the case of the city of Almaty.

The empirical analysis of Almaty demonstrates the localization of international benchmarking principles in a Central Asian urban context. Between 2020 and 2023, more than 1,500 citizen-led projects were implemented through the Participatory Budget (PB) mechanism [17]. The number of approved initiatives increased from 120 in 2020 to 560 in 2023, reflecting growing civic awareness, digital literacy, and community engagement.

The most common PB categories were urban greening, playgrounds, and lighting infrastructure, representing over 60% of all proposals. These preferences align with global trends emphasizing environmental comfort, accessibility, and safety National League of Cities.

The adoption of digital governance platforms such as Open Almaty, iKomek, and Almaty Urban Center has strengthened citizen feedback channels. According to Urban Forum Kazakhstan, 47% of respondents expressed satisfaction with the performance of these platforms, while some noted the lack of detailed follow-up communication and limited inclusion of vulnerable groups [23].

Overall, Almaty is gradually implementing the "smart and human-centered city" model, combining digitalization, public participation, and sustainability initiatives. These findings are consistent, where emphasize the link between digital participation and improved urban governance quality [24, 25].

Comparison with International Best Practices

In comparison with leading cities such as Copenhagen, Singapore, and Seoul, Almaty remains at the stage of developing comprehensive urban resilience. While substantial progress has been achieved in citizen participation and digital services, persistent challenges include air pollution (PM2.5) and unequal infrastructure development across districts.

Initiatives under the Green Almaty program – including the deployment of electric buses and the expansion of the AlmatyBike network – indicate the city's gradual alignment with international sustainable urban mobility trends. These developments reflect principles highlighted in the Resilient Cities Index and Sustainable Cities Index, emphasizing the integration of environmental and social dimensions in city performance evaluation [10, 14].

The conducted research allows the following general conclusions:

- Benchmarking is an effective diagnostic and governance tool for evaluating urban livability and policy efficiency;
- Digital governance and participatory budgeting strengthen communication between authorities and citizens, increasing trust and policy transparency;
- The adaptation of global benchmarking practices requires contextualization to local socio-economic and cultural conditions.

The case of Almaty demonstrates that the combination of digital transformation, participatory governance, and environmental modernization forms a solid foundation for developing a sustainable, inclusive, and livable urban environment in Kazakhstan.

Conclusion

City rankings have dramatically increased in popularity in media reports and are widely used in municipalities and the consulting world. They are used to justify new policies. Attention from rankings can stimulate public interest in urban policy and assist in city marketing by highlighting positive aspects.

Many scholars argue that urban benchmarking provides urban management professionals with opportunities to:

1. Assess their current situation.
2. Compare their situation with other cities.

3. Learn from the experiences of other cities in terms of policy strategies and goals.
4. More effectively prioritize funding for urban infrastructure projects.
5. Create collaborative urban networks.

The analysis showed that international and national rankings allow for identifying the strengths and weaknesses of cities, as well as developing strategies to improve the quality of life. In Kazakhstan, digitalization and citizen participation initiatives contribute to the formation of more comfortable and sustainable urban ecosystems. In the future, it is important to develop local indices that take into account the specifics of the regions and the cultural context.

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ӨМІР СҮРУ ДЕҢГЕЙІ ЖОҒАРЫ ЖӘНЕ АЗАМАТТАРДЫҢ ҚАТЫСУЫ ЖОҒАРЫ ҚАЛАЛАРДЫҢ ОЗЫҚ ТӘЖІРИБЕЛЕРІН САЛЫСТЫРУ

Андатпа

Бұл мақалада халықаралық эталондық жүйелердің салыстырмалы талдауы және олардың қала тұрғындарының өмір сүру мүмкіндігі мен азаматтардың қатысуын бағалауда қолданылуы қарастырылады. Зерттеу негізгі жаһандық индекстерді – Economist Intelligence Unit (EIU), Mercer, PwC, TUWien Smart City Model, MIT Treepedia және Ұлттық қалалар лигасын (NLC) – қалалардың салыстырмалы бағалауындағы басым тенденциялар мен жіктеу үлгілерін анықтау мақсатында жүргізілді. Бенчмаркинг тәжірибесінің төрт негізгі түрі айқындалды: көпфакторлы индекстер, бір индикаторлы рейтингтер, тақырыптық аналитикалық шолулар және диагностикалық көрсеткіштер. Алматы қаласы бойынша Қазақстанның эмпирикалық жағдайлық зерттеуі халықаралық тәжірибені жергілікті контекстке бейімдеу ерекшеліктерін көрсетеді. 2020–2023 жж. аралығында бюджеттік бағдарлама аясында, ең алдымен, көгалдандыру, инфрақұрылым және қоғамдық қауіпсіздік бағыттарында 1500-ден астам бірлескен жобалар іске асырылды. Нәтижелер

цифрлық басқару платформаларының (Open Almaty, iKomek, Almaty Urban Center) азаматтық белсенділікті арттыратынын, алайда цифрлық қолжетімділік теңсіздігімен шектелетінін көрсетеді. Зерттеу бенчмаркингтің қалалардың өмір сүру мүмкіндігі мен инклюзивтілігін арттыруда тиімді басқару және бағалау құралы ретінде қызмет ететінін дәлелдейді. Алматы мысалы қалалардың тұрақты трансформациясын ынталандыру үшін озық әлемдік тәжірибелерді, деректерге негізделген басқаруды және қатысушылық тәсілдерді біріктіру әлеуетін айқын көрсетеді.

Тірек сөздер: қаланы салыстыру, өмір сүру мүмкіндігі, азаматтардың қатысуы, «ақылды қала», тұрақтылық, цифрлық басқару, цифрлық сервис.

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БЕНЧМАРКИНГ ГОРОДОВ ПО УРОВНЮ КОМФОРТНОСТИ ПРОЖИВАНИЯ И ВОВЛЕЧЕННОСТИ ГРАЖДАН

Аннотация

В статье представлен сравнительный анализ международных систем бенчмаркинга и их применения для оценки комфортности городской среды и гражданской вовлеченности. Исследование охватывает ключевые мировые индексы – Economist Intelligence Unit (EIU), Mercer, PwC, TUWIEN Smart City Model, MIT Treepedia и National League of Cities (NLC) – с целью выявления современных тенденций и типологии методов сравнительной оценки городов. Определены четыре основных типа бенчмаркинга: многофакторные индексы, рейтинги одного показателя, аналитические обзоры и диагностические метрики. На примере г. Алматы показана адаптация международных практик к местному контексту. В период 2020–2023 гг. в рамках программы «Бюджет народного участия» реализовано свыше 1500 проектов, преимущественно в сферах озеленения, благоустройства и безопасности. Цифровые платформы (Open Almaty, iKomek, Almaty Urban Center) способствуют повышению активности населения, однако сохраняются различия в уровне цифрового доступа. Полученные результаты подтверждают, что бенчмаркинг является эффективным инструментом управления и оценки городской среды. Опыт г. Алматы демонстрирует потенциал сочетания международных практик, цифровых технологий и общественного участия для формирования устойчивых и инклюзивных городов.

Ключевые слова: бенчмаркинг городов, комфортность, вовлеченность граждан, умный город, устойчивое развитие, цифровое управление, цифровой сервис.

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