UNITED NATIONS

HSP/HA.2/14

United Nations Human Settlements Programme

Distr.: General
17 March 2025

Original: English

United Nations Habitat Assembly of the United Nations Human Settlements Programme
Resumed second session
Nairobi, 29 and 30 May 2025
Item 7 of the provisional agenda*

Adoption of the outcomes of the session

Draft international guidelines on people-centred smart cities: "Smart cities for people: empowering lives, protecting the planet, advancing prosperity"**

Report of the Executive Director

I. Introduction

1. The transformative power of digital technologies is reshaping urban life globally, offering profound opportunities to enhance how cities and human settlements are designed, planned, managed and governed. Digital technology is changing urban living in many ways including through improved urban and spatial planning, data and insights for policy, the delivery of adequate housing, land and urban basic services, among others. Cities are increasingly adopting digital technology solutions and data to deliver better services for residents and address critical urban challenges. Given the scale of these issues, such as 2.8 billion people lacking access to adequate housing[1], digitally enabled solutions are essential to drive impact at scale towards sustainable cities and human settlements.

2. While digital technology offers opportunities, ensuring these advancements benefit all urban residents and address the pressing needs of people and the planet remains a challenge. In particular, the digital divide between and within States is of particular concern[2]. Today, 2.6 billion people still lack affordable access to the internet[3] and 39% of the global population is not using the internet despite having access to it, with adoption gaps especially pronounced in rural areas, low-income countries, and women.[4] In cities, the digital divide manifests also between and within communities, hindering inclusive digital transformation and deepening existing inequalities. [5]

3. This divide is further reinforced by persistent challenges such as gaps in governance, limited participatory approaches, and insufficient resources. 51% of public authorities report difficulties in engaging local communities and only 20% of residents actively participate in smart city initiatives. Local and regional governments face additional constraints related to gaps in legal and regulatory

* HSP/HA.2/12.

** The present document has not been formally edited.

[1] UN-Habitat, SDG11 Synthesis Report 2022, https://unhabitat.org/sdg-11-synthesis-report.

[2] General Assembly A/79/L.2, The Pact of The Future, Annex I: Global Digital Compact.

[3] ITU's Facts and Figures 2024.

[4] UN-Habitat, World Smart Cities Outlook 2024.

[5] UN-Habitat, Global assessment of Responsible AI in cities, 2024.

frameworks, digital infrastructure, skills, and funding to ensure a people-centred approach and manage the societal and environmental impacts of digital technologies (including the unintended impact). For instance, only 36% of cities globally have adopted ethical guidelines for artificial intelligence and 20% data protection regulations.

4. In this context, the second session of the United Nations Habitat Assembly (2023), through Resolution 2/1, requested UN-Habitat to initiate the development of international guidelines on people-centred smart cities as a non-binding framework for developing national and local smart city regulations, plans and strategies, which would ensure that digital urban infrastructure and data contribute to making cities and human settlements sustainable, inclusive and prosperous and respectful of human rights, and to present them for consideration and possible approval by the United Nations Habitat Assembly at its resumed second session[6].

5. These guidelines propose a globally accepted normative instrument to serve as a non-binding framework for developing national and local smart city regulations, plans and strategies, which would ensure that digital urban infrastructure and data contribute to making cities and human settlements sustainable, inclusive and prosperous and respectful of human rights. At the core, the guidelines emphasize that technology serves not as an end, but as a tool for serving the needs of people and communities.

6. Following this introduction, the guidelines are structured as follows:

(a) Objectives (paragraph 1.1) which specifies the purpose of these guidelines.

(b) The Guidelines development process (paragraph 1.2), describing the comprehensive and inclusive preparatory approach that led to the guidelines.

(c) Definition of people-centred smart cities (paragraph 1.3.), explaining the features of a people centred smart city, with a definition specific to the guidelines.

(d) The International Guidelines (paragraph 2), representing the core of the guidelines, containing the principles and enabling conditions also offering strategic actions to uphold the guidelines principles.

(e) Monitoring and Evaluation (paragraph 3) which highlights mechanisms to measure progress and foster continuous improvement.

(f) Annex which includes a glossary.

A. Objectives

7. The guidelines aim to support national, regional and local governments, as well as relevant stakeholders, in leveraging digital technology for a better quality of life in cities and human settlements[7], while mitigating the associated risks to achieve global visions of sustainable urban development, in line with the New Urban Agenda, the 2030 Agenda for Sustainable Development and other relevant global agendas.[8]

8. The aim is to promote a people-centred smart cities approach that is consistent with the purpose and the principles of the Charter of the United Nations, including full respect for international law and the Universal Declaration of Human Rights, to ensure that innovation and digital technologies are used to help cities and human settlements in order to achieve the Sustainable Development Goals and the New Urban Agenda.[9]

9. The guidelines serve as a reference for Member States[10] to implement people-centred smart city approaches in the preparation and implementation of smart city regulations, plans and strategies to promote equitable access to, and life-long education and training of all people in, the opportunities provided by data, digital infrastructure and digital services in cities and human settlements, and to favour transparency and accountability.[11]

[6] UN-Habitat Assembly Resolution 2/1, 2023.

[7] This applies to cities of all scales and sizes including villages and urban areas and their peri-urban and rural surroundings.

[8] Paris Agreement; the Sendai Framework; Beijing Declaration etc.

[9] UN-Habitat Assembly Resolution 2/1, 2023.

[10] The term "Member States" should be understood to encompass all levels of governance, including national, regional, and local governments, as well as relevant institutions.

[11] UN-Habitat Assembly Resolution 2/1, 2023.

10. The guidelines recognize local and regional governments (LRGs) as pivotal actors in ensuring closing digital divides and localizing the objectives and principles of these guidelines as well as the Global Digital Compact for an open, safe, sustainable and secure digital future[12]. The guidelines are intended to complement existing global principles on digital development through a specific additional focus on the key role of local and regional governments in advancing people-centred smart city development.

11. Member States are recommended to apply the provisions on a voluntary basis by taking appropriate steps, including legislative or other measures, in conformity with the national constitutional practice and governing structures of each State as well as with international law.

12. The specific objectives of the guidelines are to:

(a) Promote a common understanding and global application of a people-centred smart city approach;

(b) Provide a universal framework with core principles and enablers for a people-centred smart approach for adequate housing and sustainable urban development;

(c) Advance a people-centred smart city approach to accelerate the implementation of the Global Digital Compact at the local level towards an inclusive, open, sustainable, fair, safe and secure digital future for all[13];

(d) Foster global cooperation and knowledge sharing connecting global visions with local implementation.

B. The Guidelines Development Process

13. The development of the International Guidelines on People-Centred Smart Cities was carried out through a comprehensive and inclusive preparatory process also as per the request within the resolution of the second session of the United Nations Habitat Assembly.[14] To ensure the guidelines reflect diverse perspectives and contextual realities, UN-Habitat conducted extensive global consultations across geographic regions, stakeholder groups, and thematic areas.

14. The Executive Director of UN-Habitat appointed 31 experts nominated by Member States as part of the Expert Working Group[15], criteria of geographical, gender and competences. This group served as the primary advisory body for drafting the guidelines, providing continued and sustained guidance to UN-Habitat through regular monthly meetings and three extended in-person and virtual Expert Group Meetings (EGMs).[16]

15. In addition, five regional online consultations were held in November 2024 across Africa, Asia-Pacific, Eastern Europe, Latin America, and Western Europe and Other States, with experts nominated by Member States in each region. They provided regional insights and context-specific feedback on the guideline's application and adaptation to the local context. An in person regional consultation was held in person in Bratislava (Slovakia) in January 2025.

16. Several targeted stakeholder engagements took place to gather inputs including civil society organizations, academia, local and regional governments, international Organizations, private sector, stakeholder Advisory Groups and UN-Habitat staff[17]. In addition, an open online public consultation

[12] In September 2024, UN-Habitat in partnership with Eurocities, UCLG, WeGo, SCEWC hosted a global consultation with local and regional governments and city networks and association to explore the role of LRGs in closing the digital divide and promoting key principles of the Global Digital Compact and the IG-PCSC. Read the Joint Global Communiqué here.

[13] General Assembly A/79/L.2, The Pact of The Future, Annex I: Global Digital Compact.

[14] UN-Habitat Assembly Resolution 2/1, 2023.

[15] The full list of experts can be found here.

[16] EGM 1: 17–18 April 2024, Strasbourg, France (in-person), EGM 2: 26–27 September 2024 (virtual), EGM 3: 22–23 January 2025 (virtual).

[17] In summary, UN-Habitat organized consultations with the following stakeholder groups: Civil Society Organizations (Nairobi, Kenya), academia (UNITAC, Hamburg, Germany), private sector (Carnegie, United States); local and regional governments and cities networks (virtual), international organizations (virtual), UN-Habitat staff (hybrid) and UN-Habitat advisory groups (virtual). Additional events were included the closed-door Dialogue for Mayors and City Leaders (Geneva); a workshop Consultation in Latin America (Maceio, Brazil); a thematic consultation "Urban Climate Change and Resilience" (Montreal, Canada); Exchange Dialogue (Berlin, Germany); workshop consultation at the Africa Smart Cities Innovation Summit (Nairobi, Kenya) and Digital Metropolis: Expert Group Meeting (Barcelona, Spain), the World Urban Forum 12 (Cairo,

invited external stakeholders[18] as well as one thematic consultation on the linkages between technologies and climate resilience.

17. The Guidelines are also informed by field projects, lessons learned, and normative work carried out under its People-Centred Smart Cities Flagship Programme[19]. Further, the World Smart Cities Outlook 2024[20] provided a data-driven foundation, offering insights into global trends, regional challenges, and opportunities in smart city development. This research highlighted the need for digital solutions that make cities and human settlements sustainable, inclusive and prosperous and respectful of human rights, while addressing local realities and capacities.

18. This collaborative and evidence-driven process ensured that the guidelines offer practical, adaptable, and actionable recommendations to support governments and stakeholders in designing and implementing people-centred smart city initiatives that are inclusive, sustainable, and resilient.

19. Cognizant of the fast-evolving pace of technology and digital transformation, the International Guidelines should be regularly revisited and updated to capture new challenges and opportunities while integrating new lessons learned from practical implementation. This will ensure that they remain relevant, effective and adoptable globally.

C. Definition of People-Centred Smart Cities

20. For these guidelines *"a people-centred smart city leverages technology to improve the quality of life of people and the social, economic and environmental sustainability and resilience of cities and human settlements. It ensures that smart city innovations are developed through participatory approaches and collaboration, providing equitable access to digital services, skills and infrastructures especially for persons in vulnerable situations[21]. It promotes and protects human rights and fundamental freedoms, with multi-level governance systems and regulations ensuring that technology supports sustainable development rather than becoming the goal itself".*

21. This definition represents a new paradigm and reflects a shift from technology for efficiency to technology for people. It ensures smart city initiatives and technologies are tailored to the needs of urban communities and their broader societal and environmental contexts. Unlike earlier smart city models, which were primarily technology-driven[22], this approach centers smart city activities on people's needs by maximizing transparency as well as community participation, representation and control.

22. It recognizes that digital technology itself does not inherently make cities "smart." Instead, being "smart" implies transformation "for" and "with" people underpinned by a commitment to promote cities that are not just technologically advanced but also inclusive, and sustainable. Furthermore, this approach ensures that urban innovation enhances the quality of life for all residents while addressing broader societal and environmental challenges.

23. The focus of people-centred smart city approach is to advance sustainable urban development leveraging digital technology for better urban and territorial planning, By readdressing the way cities and human settlements are planned, designed, financed, developed, governed and managed, to end poverty and hunger in all its forms and dimensions; reduce inequalities; promote sustained, inclusive and sustainable economic growth; achieve gender equality and the empowerment of all women and girls in order to fully harness their vital contribution to sustainable development; improve human health and wellbeing; foster resilience; and protect the environment.

II. International Guidelines on People-Centred Smart Cities

24. The Guidelines are organized into eight pillars (see **Figure 1**).:

(a) four thematic pillars, which outline the core principles, and

Egypt), Africa Urban Forum (Addis Abeba, Ethiopia), Casablanca Smart City Conference (Morocco). Last, an online consultation open to external stakeholders was opened for feedback from October to November 2024.

[18] Online consultation webpage available here.

[19] https://unhabitat.org/programme/people-centred-smart-cities.

[20] UN-Habitat, World Smart Cities Outlook 2024.

[21] New Urban Agenda and General Assembly A/79/L.2, The Pact of The Future, Annex I: Global Digital Compact.

[22] For a full overview of the smart city development and history, refer to the UN-Habitat Playbook "Centering People in Smart Cities" (p.12-16).

(b) four enabling pillars which list essential conditions to mainstream the principles of the thematic pillars.

25. However, although distinct, all eight areas are interconnected and mutually reinforcing, requiring a holistic approach and collaboration across all stakeholders. Recommended actions that Member States, broken down by national and local and regional governments, and other stakeholders can adopt to uphold and operationalize these principles are highlighted in each area.

26. The principles in the thematic areas of (i) shared prosperity, (ii) sustainability, resilience, crisis response, (iii) community participation and collaboration, (iv) human rights, inclusion and equity, should be embedded within key enablers, namely: (i) governance and regulations, (ii) digital infrastructure, data and smart city services, (iii) digital literacy and skills development and (iv) budgeting and financing.

27. Governments, at all levels, are key players in promoting a people-centred smart city approach. However, the guidelines define specific recommended actions for national and local and regional governments, recognizing the different roles they can play in this domain. A people-centred smart city approach requires a multi-level and multi-stakeholder approach that fosters effective collaboration across various governmental levels and sectors. The guidelines emphasize the importance of partnerships between governments, the private sector, academia, and civil society (referred to as “all stakeholders”) to co-create solutions that prioritize equity, inclusion, and sustainability.

28. Given the interconnected nature of these thematic areas, the order in which they are outlined in this document is neither chronological nor indicative of priority. Most principles require cross-sectoral and multistakeholder collaboration, and certain actions may create ripple effects across others.

29. While the principles are globally applicable, Member States are encouraged to adapt them to their local contexts, taking into account their priorities, readiness levels, governance structures, development objectives, and community needs. Contextual analysis and adaptation are necessary to ensure adoptability and manage potential challenges, considering the principle of proportionality and compliance and general consistency with States’ obligations under international law.

30. Depending on their context, institutional arrangements, local capacities and community needs, state actors implementing this approach can develop a tailored vision and priorities for a people-centred smart city, using the thematic areas, principles, and recommended actions contained in these Guidelines as a reference framework. The principles should be respected by all actors in a smart city ecosystem and be promoted as much as possible through legislation, regulations, initiatives, measures, investments and others. To be effective, all stakeholders share the responsibility of implementing the principles and should work cohesively toward their adoption.

Figure 1

Overview of the thematic and enabling pillars

A. Thematic Pillars

1. Shared Prosperity

31. Digital technologies should enable increased productivity and shared prosperity, promoting investments, innovations and entrepreneurship. Equitable and affordable access to digital technologies as well as digital skilling in cities, human settlements and surrounding areas can unlock the potential

of the digital economy, generating economic growth, fostering shared prosperity, increasing regional integration while helping to reduce socio-economic and geographical inequalities strengthening urban-rural linkages as part of a systemic and multilevel governance framework.

(a) Principles

(a) People-centred smart cities promote a thriving local digital economy that benefits all people, prioritizing inclusive growth, increased productivity, local job creation and shared prosperity.

(b) Holistic and sustainable digital solutions address socio-economic and geographic disparities in cities and human settlements.

(c) Innovation ecosystems promote local entrepreneurs, micro-, small and medium-sized enterprises, and start-ups to create solutions that address community needs.

(d) Digital technologies support integrated urban and territorial planning, increasing rural-urban linkages and synergies.

(e) Urban data collection and predictive analysis are harnessed to inform policymaking and investments for sustainable urban and territorial development.

(f) Digital technologies are leveraged for increased efficiency across all sectors of the economy, harnessing data-driven insights for sustainable urban development.

(b) Actions

32. All relevant stakeholders in the smart city ecosystem are encouraged to foster inclusive economic growth and balanced territorial development by promoting innovation, supporting local entrepreneurship and competitiveness, and strengthening urban-rural linkages. They should ensure that digital transformation initiatives and opportunities are locally driven, generate local revenues that benefit people and communities, especially for those in vulnerable situations, address socio-economic inequalities, and contribute to sustainable and resilient communities through collaborative efforts and responsible investments.

33. National governments in cooperation with other spheres of government and relevant stakeholders are encouraged to:

(a) Develop and enforce legal frameworks that promote digital entrepreneurship, nurture digital talent and skills, and enhance trust in the digital economy, focusing on supporting local businesses, women-owned businesses, micro-, small, and medium-sized enterprises and young entrepreneurs.[23]

(b) Implement national digital frameworks for improved productivity across territories, coordination across sectors and actors while reducing disparities in connectivity and digital economic opportunities across the rural-urban continuum, generating prosperity especially in underserved, poor or remote areas.

(c) Create long-term financial frameworks for the sustainability and scalability of smart city solutions, leveraging alternative funding sources[24] for the continuation of projects beyond piloting, while still supporting new entrepreneurial efforts.

(d) Provide appropriate fiscal incentives and targeted subsidies to enhance local fiscal capacities that empower local authorities to develop technology solutions.

(e) Update procurement processes prioritizing interoperable technical platforms and intellectual property rights arrangements that enable secure and transparent data and knowledge sharing among public and private parties within states, ultimately facilitating the participation of local businesses and micro-, small and medium-sized enterprises.

(f) Monitor the impact of the digital economy[25] in fostering inclusive economic growth, including through job creation and increased productivity, considering also digital solutions to support the gradual formalization of the informal economy.

[23] General Assembly A/79/L.2, The Pact of The Future, Annex I: Global Digital Compact.

[24] Refer to the Governance and regulation section and the financing for some examples.

[25] Member States are encouraged to monitor and analyze the impact of “digital jobs” and smart city initiatives on economic development, job creation, prosperity, and overall well-being to drive sustainable and equitable economic transformation.

34. Local and regional governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Leverage digital technology and predictive models for local economic development, optimizing operations, enhancing decision making and creating new opportunities for economic growth in all sectors of the economy including job creation, revenue enhancement, higher productivity and increased investments to foster community well-being.

(b) Develop effective frameworks to advance the local digital economy, supporting public-private partnerships, local entrepreneurship and industries.

(c) Increase incentives and investments to expand the local digital economy partnering closely with local and international investors, aiming to enhance the competitiveness and attractiveness of the local economy.

(d) Connect economic growth with territorial policies by integrating smart city strategies that promote equitable spatial development.

(e) Boost local businesses and industries, micro-, small and medium-sized enterprises and community-based businesses leveraging digital technologies.

(f) Transform the informal economy through data-driven strategies that promote local job creation.

(g) Create incentives for actors through training centers, innovation hubs, test beds, accelerators, open-innovation, and open-source communities to foster local solutions.

(h) Support the care economy by designing technologies and smart city services, including personalized digital urban services, that reduce spatial inequalities, for instance connecting urban and rural areas via smart logistic networks and exploring the impact of technologies on access to affordable housing, create sustainable local jobs and improve the quality of life for families, caregivers, youth, older persons, and persons with disabilities, among others.

(i) Promote a culture of innovation in the local economy, including promoting and supporting the adoption of digital technologies and data use by local industries, micro-, small and medium-sized enterprises, and entrepreneurs, skills development programmes and other initiatives.

(j) Implement dedicated programs to support grassroots initiatives and entrepreneurial ventures using digital and social innovation.

(k) Leverage digital technology efforts to protect and safeguard cultural and natural heritage also as an economic asset that can enhance local and national economies.

35. Relevant stakeholders are encouraged to work together to:

(a) Act as intermediaries between communities and policymakers to ensure community participation is encouraged through policies, incentives and programmes, aiming at facilitating access in the digital economy, support job creation and generate shared prosperity.

(b) Conduct technology and data-driven assessments to evaluate the impact of digital technology on urban economies, focusing on sustainable economic growth, inclusive employment opportunities and the creation of new market prospects[26].

(c) Channel resources and investments into local digital infrastructure, smart city solutions, and entrepreneurship initiatives to create sustainable and decent jobs and support underserved communities.

(d) Develop open-source, user-friendly digital tools that address local challenges and enhance inter-municipal cooperation.

(e) Establish open-access knowledge hubs and platforms to disseminate inspiring practices and solutions, lessons learned, and scalable models.

2. Sustainability, Resilience and Crisis Response

36. Digital urban infrastructure, technology and data should contribute to making cities and human settlements sustainable and resilient, promoting biodiversity and urban ecosystem protection, restoration and sustainable use, promoting clean energy, resilience and climate change adaptation and mitigation.

[26] UN-Habitat, World Smart Cities Outlook 2024.

37. They should further enable disaster risk reduction and management, reduce vulnerability, build resilience and responsiveness to natural and human-made hazards and foster mitigation of and adaptation to climate change. Integrating low-carbon technologies, sustainable resource management models, and early warning systems with proactive risk mitigation, climate adaptation, and crisis response mechanisms is essential to protect people and the planet, fostering inclusive, sustainable, and resilient urban environments.

(a) Principles

(a) Digital infrastructure and technologies designed to contribute to reducing the environmental impact of cities and minimizing the pollution and the consumption of natural resources caused by digitalization itself.

(b) Digital technologies and data leveraged for proactive urban disaster risk response, prevention, reduction, recovery and reconstruction as well as for the management of natural and human-made disasters and conflicts including humanitarian crisis, as well as mitigation of and adaptation to climate change.

(c) Digital tools and services in urban development promote responsible and efficient use of technology through sustainable lifecycle practices, including sustainable resource, including water, management and e-waste reduction practices.

(d) Digital technologies and data-driven solutions, ensure environmental sustainability and resilient urban development, biodiversity and ecosystem protection, restoration and sustainable use, resilience and climate change adaptation and mitigation.[27]

(e) Digital infrastructure and data platforms for smart city development include disaster recovery plans, security protocols, and data governance frameworks to ensure resilience, public safety and maintain essential functionality even when advanced systems are disrupted.

(b) Actions

38. All stakeholders in the smart city ecosystem should leverage innovation, responsible use of technology and data including digital twins and big data, to reduce the environmental impact of cities and minimize the pollution and the consumption of natural resources caused by digitalization, strengthening resilience in human settlements, enhancing disaster risk reduction and mitigation efforts for sustainable recovery, adaptation strategies and resilience in facing climate challenges.

39. National governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Develop and enforce regulations and standards for digital infrastructure and technology sustainability in urban development through energy efficiency, environmental impact reduction, biodiversity and ecosystem protection, restoration and sustainable use[28], and e-waste management.

(b) Develop and implement policies for digital technology and infrastructure that encourage sustainable urban resource management practices, including device reuse, recycling, and right-to-repair principles.

(c) Empower national regulatory bodies to assess and monitor the environmental impacts of digital infrastructure, platforms, data centers and digital tools throughout the product lifecycle[29], and across both sectors and government levels, to minimize and mitigate any negative environmental impact on cities as well as on residents and community health.

(d) Support national and regional governments, to the extent possible, with basic infrastructures or platforms to be able to prevent, mitigate and respond to disasters and conflict crises.

(e) Mainstream sustainability principles in national smart city strategies, such as eco-design, into national and local digital transformation, environmental and sector-specific strategies.

[27] UNHA Resolution “Biodiverse and resilient cities: mainstreaming biodiversity and ecosystem services into urban and territorial planning” HSP/HA.2/Res.4.

[28] UNHA Resolution “Biodiverse and resilient cities: mainstreaming biodiversity and ecosystem services into urban and territorial planning” HSP/HA.2/Res.4.

[29] For example, by adopting standard methodologies for life cycle assessment (LCA) and environmental impact assessments to evaluate the environmental impact throughout the product lifecycle of technology solutions.

(f) Provide fiscal incentives for investments in sustainable digital infrastructure, renewable energy, and eco-friendly technologies for urban development (e.g., subsidies, tax breaks, grants, green bonds).

(g) Promote green procurement by integrating environmental sustainability criteria into procurement processes to prioritize digital products and services that are environmentally friendly, energy-efficient, and socially responsible.

(h) Promote the use of data and digital technologies to mitigate climate change impacts and GHG emissions due to rapid urbanization, especially in key sectors including building and construction, transportation and energy[30].

(i) Invest in smart technologies and data-driven solutions to address environmental challenges in urban development such as deforestation, biodiversity loss, soil degradation, and excessive water and energy consumption.

(j) Establish contingency plans for critical infrastructure and digital services to ensure service continuity during climate and humanitarian crises.

(k) Strengthening cybersecurity measures to secure digital infrastructure against cyber threats and sabotage, including during times of conflict and crises.

40. Local and regional governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Reduce GHG emissions and mitigate climate change impacts in key urban sectors like construction, transportation, and energy through technology and data-driven solutions and renewable energies[31].

(b) Use digital platforms for urban disaster prevention, mitigation and preparedness as well as for disaster relief operations and for recovery and reconstruction, including big data, digital platforms and digital twins, by strengthening evidence-based land-use planning, early warning systems, and real-time monitoring of crises[32].

(c) Promote biodiversity and ecosystem protection, restoration and sustainable use in urban development through technologies by addressing local deforestation, soil degradation, and excessive water and energy consumption.

(d) Promote sustainable resource management practices locally by encouraging resource efficiency, reuse, recycling, and sustainable lifecycle management of digital tools and infrastructure.

(e) Adapt contingency plans to ensure critical digital services and infrastructure remain secure and operational during climate events, cyber threats, and humanitarian crises, this includes developing response protocols for localized disruption.

(f) Leverage digital technology to improve resource efficiency and water management, including smart grids, waste management monitoring, climate monitoring, and others.

41. Relevant stakeholders are encouraged to work together to:

(a) Develop energy-efficient, durable and easily recyclable digital infrastructure, tools and services promoting the use of renewable materials and sustainable product life cycles for sustainable urban development[33].

(b) Develop sustainable digital solutions and smart city innovations that mitigate environmental challenges posed by digital infrastructure.

(c) Strengthen corporate sustainability by adopting environmentally responsible practices and initiatives aimed at reducing resource consumption and fostering sustainable resource management models by launching campaigns to influence sustainable behaviors.

(d) Invest in and promote green technologies, promoting clean and renewable energy sources to manage energy consumption and efficiency of digital infrastructure and platforms.

[30] UNFCCC, The Paris Agreement.

[31] UNFCCC, The Paris Agreement.

[32] For example, local digital twins, urban observatories etc.

[33] Private sector can enhance sustainability practices by promoting take-back programs for electronics to promote recycling and reuse and invest in the refurbishment of digital devices.

(e) Conduct research on prototype tools that promote sustainable digital transitions with societal and ecological benefits, including energy-saving and energy-efficient algorithms and eco-conception in digital tools, among others.

(f) Conduct environmental impact assessment of digital tools and infrastructure and recommend improvements in energy consumption, e-waste management and resource conservation.

(g) Promote capacity development and skills enhancement to design and manage environmentally responsible technologies.

3. Community Participation and Collaboration

42. Active community participation and collaboration are key pillars of people-centred smart cities. The meaningful participation of communities in decision-making, planning and follow-up processes as well as enhanced civil engagement and co-provision and co-production are critical for smart city development to be people-centred. To ensure that policies, initiatives and solutions are aligned with the needs and values of local communities, municipal governments are expected to continuously engage with them through a variety of channels and in various phases of smart city development[34].

43. Fostering trust among stakeholders, amplifying the voices of local communities in decision-making processes, and creating inclusive opportunities for co-creating tools and services are essential to reflect diverse perspectives. Transparent and accountable governance further strengthens these efforts by clearly communicating the goals, processes and outcomes of community engagements.

(a) Principles

(a) People and communities are actively involved in identifying challenges, setting strategic goals, and co-designing smart city solutions.

(b) Transparent communication with open and timely information sharing with residents and communities on goals, progress, performance and outcomes of smart city initiatives is needed to foster trust and ensure accountability.

(c) Equipping communities with the necessary skills, tools and resources to engage meaningfully in smart city related decision-making and co-creation processes is key for inclusive participation fostering long-term sustainable change.

(d) Establishing structured feedback mechanisms, performance metrics and impact assessments ensures that community input shapes policy decisions and project implementation.

(e) Collaboration across stakeholders should be promoted to encourage diverse and equal participation, ensuring smart city solutions are inclusive, responsive, and community driven.

(b) Actions

44. All stakeholders in the smart city's ecosystem play a role in promoting participation and engagement of people, communities and relevant stakeholders in the planning and implementation of smart city initiatives. Collaboration among relevant stakeholders and ensuring meaningful and responsible community empowerment and involvement is essential for the successful design, implementation, and sustainability of any smart city initiatives, including policies, projects, services and others. Mechanisms should be in place to broaden inclusive platforms for meaningful community participation decision-making, planning and follow-up processes in smart city initiatives.

45. National governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Mainstream community participation and collaboration in national urban policies and digital and smart city strategies, through context specific strategies and participatory frameworks.

(b) Develop legal frameworks and general guidelines to enhance community participation and partnerships, public consultation, and public data and information in order to increase transparency, security and inclusive participation.

(c) Leverage digital tools to communicate policy decisions and share reports, policy documents, and public budgets in open, accessible formats.

[34] UN-Habitat, World Smart Cities Outlook 2024, p.38.

46. Local and regional governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Define and implement guiding principles as well as urban policies for participatory consultation in smart city initiatives ensuring real-time updates and structured feedback loops that regularly inform the general public and residents on progress.

(b) Develop participatory platforms and tools for smart city initiatives with accessible features format responding to different needs and abilities and offering in-person alternatives to ensure to ensure that no one is left behind.

(c) Appoint advisory councils and public officials to strengthen engagement with community organizations and leaders.

(d) Promote flexible and distinct participatory approaches, tools and formats responding to different needs and abilities, such as online/digital forums and surveys, local assemblies, town halls, public space activations, collaborative spaces and participatory budgeting, as well as collaborative spaces etc.

(e) Monitor barriers to community participation including digital literacy, accessibility, information, language and others and developing measures and tools[35] to address them.

(f) Create feedback mechanisms to assess needs, mitigate risks and maintain open communication with residents and communities, keeping them informed on both the progress and the integration of their feedback to smart city initiatives.

(g) Use public feedback and metrics to evaluate the impact and efficiency of smart city interventions locally.

47. Relevant stakeholders are encouraged to work together to:

(a) Advocate for greater community participation and public sector accountability for actions and progresses of smart city initiatives, including ensuring continued and open communication.

(b) Develop digital platforms and tools for public participation for the co-design and evaluation of smart city initiatives, especially for persons in vulnerable situations engaging also those groups that do not engage in smart city initiatives.

(c) Empower people and communities to access and use urban data to address urban challenges and be involved through co-creation initiatives.

(d) Conduct assessments to identify community participation gaps and barriers as well as user-experience tests and impact evaluation and uptake by local communities.

(e) Promote research and innovation including the establishment of innovation and community hubs to drive community-centred solutions.

(f) Foster public trust to facilitate the adoption of emerging technologies through community participation and public-private partnerships.

(g) Promote the development of collaborative spaces such as urban innovation labs and hubs to support the co-design of smart city tools and services with local communities.

(h) Participate in the preparation, implementation and monitoring of consultation processes in smart city initiatives, supporting government authorities in assessing needs, increasing community participation and collaboration.

4. Digital Human Rights, Equity and Inclusion

48. Promoting and protecting human rights, equitable and affordable access, representation and inclusive approaches are essential preconditions to ensure smart city development is “people-centred”. Anchored in international law, including international human rights law, all human rights, including civil, political, economic, social and cultural rights, and fundamental freedoms, are respected, protected and promoted online and offline[36]. Digital technologies should be harnessed to advance human rights in cities and human settlements.

[35] E.g. consultation application.

[36] General Assembly A/79/L.2, The Pact of The Future, Annex I: Global Digital Compact.

49. Additionally, it is crucial to bridge digital gaps by ensuring that all individuals can effectively access and utilize digital tools and services. Ensuring the equitable involvement and values of people, including women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations, and ensuring that digital and other new technologies help reduce spatial, economic, social and digital inequalities, overcome economic and social development challenges. For this, accessible and affordable data and digital technologies and services are essential to enable every person to participate fully in smart city initiatives. Actions to uphold equity and inclusion in smart city development include working towards universal and meaningful connectivity and equitable deployment of infrastructure such as electricity grids, 4G and 5G networks.

50. These guidelines promote a people-centred smart cities approach that is consistent with the purpose and the principles of the Charter of the United Nations, including full respect for international law and the Universal Declaration of Human Rights, to ensure that innovation and digital technologies are used to help cities and human settlements in order to achieve the Sustainable Development Goals and the New Urban Agenda[37].

(a) Principles

(a) Legislation is needed to guide smart city development by protecting individuals against violations and abuses of the right to privacy, namely through the unlawful and arbitrary collection, processing, retention, sharing or use of personal data by individuals, governments, business enterprises and private organizations.[38]

(b) Individuals have control over their personal data and be informed about the collection, use, sharing and retention of their data for smart city development that may affect their right to privacy, with appropriate measures adopted including informed consent, data sovereignty, opt in and opt out right, for them to amend, correct, update, delete and withdraw consent for the data[39].

(c) The systematic use of human oversight and the early identification of risks associated with technology deployment for urban development are ensured through proactive and effective prevention, mitigation measures and redress mechanisms, to prevent discrimination, exclusion and other potential harm, particularly for persons in vulnerable situations.

(d) AI systems and other algorithm-based technologies for urban development are designed and implemented to uphold transparency, explainability, fairness, accountability, and human oversight also preventing bias, discrimination, and harm, also to promote and protect human rights and fundamental freedoms[40] and ethical principles.

(e) Digital tools and services are inclusive and accessible to all, including women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations[41].

(b) Actions

51. All stakeholders in the smart city's ecosystem should collaborate to ensure equitable and inclusive access to technology and support the development and implementation of accountability frameworks, readiness or remedy mechanisms and safeguards to respect, protect and promote human rights and fundamental freedoms, including full respect for international law and the Universal Declaration of Human Rights.

52. Both online and offline measures are key to respect and protect the right to privacy, including in the context of digital communications, new and emerging technologies so that no one shall be subjected to arbitrary or unlawful interference with his or her privacy, family, home or correspondence, and the right to the protection of the law against such interference.

53. Independent, effective, adequately resourced and impartial judicial, administrative and/or parliamentary domestic oversight mechanisms need to be established or maintained to ensure transparency, as appropriate, and accountability for State surveillance of communications, their interception and the collection of personal data[42]. This requires appropriate safeguards, including

[37] UN-Habitat Assembly Resolution 2/1, 2023.

[38] GA resolution A/RES/77/211, Promotion and protection of human rights: human rights questions, including alternative approaches for improving the effective enjoyment of human rights and fundamental freedoms, 2022 – (7g).

[39] General Assembly A/79/L.2, The Pact of The Future, Annex I: Global Digital Compact.

[40] UN-Habitat Assembly Resolution 2/1, 2023.

[41] Ibid.

[42] Ibid.

human rights due diligence and effective oversight and remedy mechanisms, to prevent and address any adverse impact on human rights arising from the use of digital and emerging technologies and protect individuals against violations and abuses of their human rights in the digital space.

54. National governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Embed human rights principles based on international human rights law into all digital technology regulations, policies, and processes, including privacy and data protection to safeguard individuals from violations and harmful impacts of emerging technologies.

(b) Enact and enforce national legislation and mechanisms to put an end to violations of the right to privacy and to create the conditions to prevent such violations, allow to report and remedy human rights violations in digital and online spaces, addressing, in particular against women and children, while safeguarding privacy, dignity, security, and personal integrity.

(c) Develop standards and guidelines to counter hate speech, bullying, disinformation and unlawful surveillance, promote content moderation and accountability, ensuring a safe, participatory, and inclusive digital space that protects persons in vulnerable situations, particularly women, girls, and children from online threats.[43]

(d) Establish regulatory guidance and oversight on the ethical use of technology and human rights, including frameworks for impact assessment, such as human rights and data protection due diligence throughout the lifecycle of technology use.

(e) Safeguarding public trust by putting in place cybersecurity measures that protect data and infrastructure, including trusted, secure and resilient digital infrastructure.

(f) Develop national information and communications technology policies and e-government strategies, in order to make information and communications technologies accessible to the public, including women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations, to enable them to develop and exercise civic responsibility, broadening participation and fostering responsible governance, as well as increasing efficiency.[44]

(g) Promote universal, affordable, and meaningful connectivity[45] ensuring that digital infrastructure and smart city services are accessible to all, particularly persons in vulnerable situations, low-income and underserved communities.

(h) Establish or maintain existing independent, effective, adequately resourced and impartial judicial, administrative and/or parliamentary domestic oversight mechanisms capable of ensuring transparency, as appropriate, and accountability for State surveillance of communications, their interception and the collection of personal data.

(i) Conduct regular digital inclusion assessments to identify and address gaps in connectivity, accessibility, usage, digital literacy and infrastructure deployment.

55. Local and regional governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Develop local legislation and frameworks to promote and protect human rights and fundamental freedoms, to protect the right to privacy, including civil, political, economic, social and cultural rights, and fundamental freedoms, are respected, protected and promoted online and offline.

(b) Develop local policies and strategies to make digital technologies accessible to the public, aligning to national frameworks, including women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations to enable them to develop and exercise civic responsibility, broadening participation and fostering responsible governance, as well as increasing efficiency.

(c) Implement digital inclusion strategies and plans with stakeholders to address gaps in connectivity, digital literacy, and accessibility, supported by community advisory mechanisms.

(d) Invest in digital infrastructure aimed at universal and meaningful connectivity through service provision regulation, incentives, and subsidies, particularly for persons in vulnerable situations.

[43] General Assembly A/79/L.2, The Pact of The Future, Annex I: Global Digital Compact.

[44] New Urban Agenda.

[45] https://www.itu.int/itu-d/sites/projectumc/home/aboutumc/.

(e) Assess the digital divide through local surveys and data analysis to identify disparities to ensure equitable involvement including for women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations.

(f) Make information and data about smart city initiatives available to the public that is diverse, clear, transparent and reliable enabling informed and meaningful participation of all stakeholders while combating misinformation.

(g) Enforce universal accessibility standards for digital services, platforms, and tools.

56. Relevant stakeholders are encouraged to work together to:

(a) Develop inclusive, universally accessible, fair and transparent smart city tools adapted to the needs of women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations[46].

(b) Develop user-centred digital public and private services that enforce universal and meaningful connectivity standards, integrate assistive technologies, and provide multilingual and culturally tailored information to reduce digital, language and literacy barriers.

(c) Conduct human rights due diligence, impact assessments and algorithm risk evaluations throughout the lifecycle of technology to evaluate adverse risks[47], report potential human rights law violations and prevent adverse impacts to enforce human rights diligence in public and private organizations[48].

(d) Analyze accessibility gaps and usability obstacles for groups at risk of exclusion and adapting service design to meet their specific needs.

(e) Implement fact-checking and robust content moderation systems to effectively identify and remove harmful content, such as hate speech, to ensure a safer and more respectful digital environment.[49]

(f) Develop transparency measures, enacting informed consent practices, impact assessments and safeguards to protect personal data throughout the data lifecycle of collection, sharing and use, with appropriate measures adopted for them to amend, correct, update, delete and withdraw consent for the data.[50]

(g) Provide access to effective remedy[51] mechanisms for users to report and address human rights violations and harmful impacts associated with smart city technologies.

(h) Promote an open and safe online environment that empowers users by implementing strategies that foster media and information literacy, provide online safety-related training materials, enforce cybersecurity measures and safeguards[52] human rights to protect individuals from digital threats and attacks.

(i) Advocate for and implement digital inclusion initiatives for the meaningful engagement and benefit of women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations.

B. Enabling Pillars

1. Governance and Regulations

57. Transparent and accountable governance frameworks are key enablers for managing digital infrastructure, data, technologies and services responsibly and securely in smart city initiatives. Clear roles and responsibilities should be defined to ensure that the design, deployment and oversight of digital infrastructure and tools and data systems promote sustainable, resilient, and inclusive cities and human settlements.

[46] UN-Habitat Assembly Resolution 2/1, 2023.

[47] OHCHR Resolution 41/11 of 11 July 2019: New and emerging digital technologies and human rights and Resolution A/78/L.49: Seizing the opportunities of safe, secure and trustworthy artificial intelligence systems for sustainable development.

[48] UN-Habitat, World Smart Cities Outlook 2024, p.78.

[49] UNESCO Guidelines for the Governance of Digital Platforms.

[50] GA resolution A/RES/77/211.

[51] OHCHR Guiding Principles for Business and Human Rights.

[52] UNESCO Guidelines for the Governance of Digital Platforms.

58. Regulatory authorities can strengthen public oversight and ensure secure, inclusive, and accountable digital governance to promote and protect human rights and fundamental freedoms, to promote equitable access to the opportunities provided by data, digital infrastructure and digital services in cities and human settlements, and to favour transparency and accountability[53] with active involvement of local communities to promote transparency, participation, and equitable access to digital infrastructure, data and services.

59. Multi-level governance and multi-sectoral collaboration are essential along with policies and safeguards to protect data privacy, ensure data ownership and informed consent, cybersecurity, and digital human rights, guarantee transparency, accountability, and ethical use of emerging technologies, such as AI, and data platforms.

(a) Principles

(a) Institutional coordination mechanisms are established to align national and local urban and digital strategies, plans and investments ensuring that initiatives are coherent, place-based, community-led, and responsive to local contexts and needs.

(b) All levels of government contribute to the development of robust and enabling regulatory frameworks that support consistent policies and processes for digital transformation anchored in a people-centered approach.

(c) National policies respect and preserve local autonomy by adhering to the principles of subsidiarity and proportionality, allowing local governments to adapt smart city regulations to their specific contexts and set up independent oversight mechanisms[54].

(d) Regulatory arrangements are transparent and include mechanisms for independent oversight to ensure accountability and public trust in digital governance for smart cities.

(b) Actions

60. Governmental actors at national, regional and local levels are responsible for ensuring appropriate institutional arrangements to reflect the need for new roles and responsibilities, new skills and new rules and regulations to procure and manage digital technologies in cities. The other stakeholders and actors are expected to provide skills and collaborate to design policies and regulations while abiding by them.

61. National governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Develop institutional arrangements for effective collaboration across governmental levels as well as sectors, defining roles and responsibilities and accountability across administrations and increasing institutional capacities to manage new emerging technologies in a people-centred and sustainable manner.

(b) Create a functional and multidisciplinary mechanism like a committee, taskforce or similar structure across governmental bodies to align urban and territorial and digital policies and strategies enabling synergies and coordination across departments, units and administrations.

(c) Ensure adequate capacities, mandates and expertise of public administrations to manage and oversee smart city projects/initiatives

(d) Develop and enact regulations, policies and standards to govern digital technologies, infrastructure and data in alignment with international human rights law to safeguard privacy, consent, and data ownership rights.

(e) Develop dedicated data governance policies and strategies that define processes, rules and roles and oversee data sharing, data use and data infrastructure, including a data ethics framework to guide public servants in the appropriate and responsible use of data[55].

(f) Establish national policies, regulatory and governance approaches and frameworks to promote open, safe, secure and trustworthy AI systems[56] deployment, including clear guidelines on accountability, bias prevention, and transparency.

[53] UN-Habitat Assembly Resolution 2/1, 2023.

[54] UNESCO, Guidelines for the Governance of Digital Platforms.

[55] OECD (2023). Smart City Data Governance: Challenges and the way forward.

[56] UN General Assembly's Resolution 78/L.49 "Seizing the opportunities of safe, secure and trustworthy artificial intelligence systems for sustainable development".

(g) Ensure clear governance arrangements and processes for secure interoperability of smart city technologies, interoperable design and minimum interoperability mechanisms within states to enable the safe integration of data from multiple sources and digital exchanges.[57]

(h) Support the localization and operationalization of national strategies, policies and legislation at the local and regional levels, embedding them into local regulations, local development plans, smart city strategies, masterplans.

62. Local and regional governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Develop Smart City and Data Strategies to guide technology adoption, data governance, and privacy protection.

(b) Define clear roles and responsibilities for managing digital technologies locally, enhancing interdepartmental collaboration, maintaining accountability and addressing overlaps and silos.

(c) Appoint specific unit/department to oversee smart city initiatives, ensure coordination mechanisms are in place, operate and maintain digital platforms and implement legal frameworks for data protection and sharing.

(d) Create multidisciplinary committees or taskforces to support project design and deployment and promote collaboration within the local administration.

(e) Collaborate with other municipalities to share resources, infrastructure and expertise for greater efficiency and expanded access to digital capabilities and digital public goods.

(f) Establish privacy, cybersecurity, and transparency protocols to ensure residents can make informed decisions and opt in or out of digital services.

(g) Adopt secure interoperability standards to facilitate safe data integration and digital exchanges according to the public administration needs.

63. Relevant stakeholders are encouraged to work together to:

(a) Ensure data transparency and public access by sharing insights and data generated by smart city tools, algorithms and digital infrastructure through publicly accessible portals.

(b) Embed privacy and security by design by integrating privacy safeguards and data protection measures into all phases of technological development and deployment to ensure compliance with international standards.

(c) Develop and deploy transparent, unbiased artificial intelligence algorithms to ensure fairness, accountability, and trust in decision-making processes.

(d) Implement AI ethics frameworks that prioritize fairness, explainability, and human oversight, including regularly assessing and mitigating algorithmic bias in AI systems and decision-making processes.

2. Digital Public Infrastructure, Data and Smart City Services

64. Robust and inclusive digital Infrastructure and data is essential for enabling the development, deployment and scaling of digital tools and services shaped to address specific urban challenges[58]. Strengthening public oversight over critical infrastructure and essential services is vital to protect cybersecurity and digital human rights. Dedicated public entities should be empowered to govern digital systems effectively while local communities should be actively involved in the design, implementation, and monitoring of these infrastructures.

65. Smart city services should follow principles of inclusivity, accessibility and responsivity to the needs of all community members. These services should be co-created with communities, emphasizing public value, local needs, and the subsidiarity principle. To enhance urban service delivery, smart city solutions should integrate seamlessly into urban systems, support equitable spatial development, and

[57] ITU, “Minimal Interoperability Mechanisms for smart and sustainable cities and communities”. https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18458.

[58] As per recommendations from the World Smart Cities Outlook 2024, we refer to solutions applicable to one or more urban sectors: 1) urban and spatial planning, 2) housing, 3) mobility, 4) energy, 5) water management, 6) waste management, 7) prevention and management of natural disasters, 8) safety and security, 9) welfare.

prioritize sustainability and resilience. Digital solutions should be integrated to reduce spatial inequalities and connect urban and rural areas through smart logistics networks.

66. Integrating digital technology in urban and territorial planning is essential to maximize benefits for sustainable urban development. The integration of urban digital services and intelligent public transport systems for better mobility, access to adequate housing, land use planning and administration, waste management, water services, among others, should focus on improving urban living conditions and ensuring widespread adoption across diverse socio-economic groups. Digital solutions can enable spatial planning for compact urban form and sustainable densification. Interoperable, scalable, and technology-neutral solutions are essential for effective delivery of urban services and long-term sustainability.

(a) Principles

(a) Resilient, safe, inclusive and interoperable digital public infrastructure is essential to deliver services at scale and increase social and economic opportunities for all in cities and communities and there is a need to increase investment in their successful development with the participation of all stakeholders.[59]

(b) Smart city services are designed to be universally accessible, particularly for persons in vulnerable situations, while being energy neutral, interoperable, scalable and adaptable to evolving urban needs.

(c) People and communities' co-creation of smart city services ensures integrating diverse perspectives in design, implementation, and monitoring and anticipating potential barriers to accessibility and use.

(d) Digital platforms, digital twins and tools including city information modeling platforms, geospatial information systems, real-time data and predictive analytics, are used to enhance efficiency, inclusivity and transparency in urban and territorial planning, and urban design, land administration and management, and access to urban and metropolitan services.

(e) A human rights-based approach informs the entire data lifecycle, from collection, storage, processing, sharing, and disposal, protecting individual privacy, upholding human rights, and ensuring transparency and accountability throughout the digital transformation process.

(b) Actions

67. To effectively implement these principles, coordinated actions are required from national governments, local and regional authorities, and relevant stakeholders. These actions should focus on investing in resilient digital infrastructure which increase efficiency, accessibility and transparency of urban and territorial planning, promoting universal access to urban services, open standards, and ensure transparency and accountability of digital processes.

68. National governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Invest in digital infrastructure with a focus on digital public goods and digital public infrastructure as key drivers of inclusive digital transformation and innovation with the participation of all stakeholders.

(b) Strengthen public oversight and appoint national regulatory bodies to oversee cybersecurity, data privacy, and the governance of digital infrastructures, as well as their environmental impact.

(c) Promote the adoption of open standards, interoperability protocol and open-source software to regularly evaluate technologies and improve their safety, continuity, resilience and reliability.

(d) Standardize interoperability and open data across digital systems at all governmental levels to prevent silos, enable seamless service delivery[60], open-source solutions increase urban data availability.

[59] General Assembly A/79/L.2, The Pact of The Future, Annex I: Global Digital Compact.

[60] Seamless smart city services integrate various urban systems to enhance efficiency, accessibility and to improve the quality of life of people living in cities and human settlements. Some examples include integrated public transportation systems, intelligent waste management, city apps as well as generally platforms integrating data from different urban services such as transport, health services, waste, water, energy, land and housing data among others.

(e) Define standards for local service provision of smart city tools and services[61] based on the principle of subsidiarity and ensure the local level has the capacities and resources to exercise such provision[62].

(f) Enable local administration control, ownership and operation of physical infrastructure and urban data assets needed for connectivity and digital infrastructure development, maintaining oversight and secure smart city assets[63].

(g) Develop innovative data stewardship models and legal structures to promote the ownership and management of digital infrastructure and data assets by community groups or other stakeholders.

(h) Create networks of data stewards across cities for knowledge exchange and peer learning opportunities.

69. Local and regional governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Use technologies to deliver smart city services that are inclusive, ensuring access for women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations.

(b) Develop transparent, safe and secure digital systems and user-centred safeguards that can promote public trust and use of digital services.

(c) Ensure beneficiary participation in the design, implementation, and monitoring of smart city services to enhance their effectiveness.

(d) Provide digital and data infrastructure including by exploring public-private partnerships to increase capacities, while supporting community-led digital infrastructure initiatives.

(e) Advance digital public goods including through open-source software, open data, open standards and open content to address the needs of people and communities.

(f) Invest in municipal internet networks providing free public WiFi in city buildings and public spaces, enhancing usability of public spaces.

(g) Standardize data protocols through the adoption of open standards, metadata classifications, and common definitions to enhance interoperability and data exchange.

(h) Facilitate data sharing and collaboration across municipalities, with other levels of governments and stakeholders to monitor smart city services and inform urban policy.

(i) Establish protocols to protect residents' data privacy, incorporate principles of privacy in a digital age, equity, security, and interoperability, aligned with community priorities.

(j) Open urban data to communities, empowering them to address challenges through projects like citizen science and crowdsourcing initiatives.

(k) Enhance skills and knowledge of local public officials on digital data management and implementing processes to oversee the entire data lifecycle (collection, storage, sharing, and deletion).

70. Relevant stakeholders are encouraged to work together to:

(a) Advocate for digital urban services to address the needs of people and communities by empowering communities and facilitating support for persons in vulnerable situations in accessing urban services through needs assessments, consultation processes and feedback mechanisms.

(b) Conduct research and data collection to design and pilot technologies and smart cities services that improve city planning, residents' participation and service optimization.

(c) Contribute to research user needs assessment as well as on the use of emerging technologies and digital public infrastructure applications.

(d) Finance infrastructure projects through investment funds, private bank loans, public-private partnerships or debt financing to the local government to increase investments.

[61] For example: https://digitalprinciples.org/ or https://www.undp.org/digital/standards.

[62] UN-Habitat, International Guidelines on Decentralization and Access to Basic Services to All.

[63] UN-Habitat, People-Centred Smart Cities Playbook Series: Building & Securing Digital Infrastructure.

(e) Facilitate the design and supply of secure and trustworthy digital platforms, applications and solutions that protect people's privacy.

(f) Use open standards, protocols, and tools to collect, share and use data and to open data of interest for public policies, monitoring smart city services and community engagement.

(g) Develop open-source, user-friendly digital tools that address local challenges and enhance inter-municipal cooperation.

(h) Establish open-access knowledge hubs and platforms to disseminate inspiring practices and solutions, lessons learned, and scalable models.

(i) Develop tools to make data accessible to communities and support stakeholders in increasing tools uptake and use.

(j) Collaborate with the public and private sectors to co-design smart city services and support community groups willing to design their own services.

(k) Support local communities in developing community owned digital infrastructure and collecting and use community data for designing solutions based on local needs.

3. Digital Literacy and Skills Development

71. Digital literacy is a key enabler for people-centred smart cities to ensure everyone has the capabilities to actively participate in smart city development and benefit from smart city tools and services, leaving no one and no place behind. This involves building the necessary skills and capacities across all levels of government and sectors of society to engage with and benefit from smart city tools and services, with a specific focus on those historically underrepresented in the digital economy or with limited access to education.

72. Capacity development should go beyond basic digital technologies to include competencies related to the dissemination, collection, storage, and processing of information for the public good. Inclusive learning opportunities should be provided to all stakeholders to navigate challenges and harness opportunities posed by digital transformation and to fully participate in urban life.

(a) Principles

(a) Digital literacy efforts should ensure that everyone, regardless of background, has access to basic digital skills to fully access digital and offline basic services in urban life.

(b) Learning opportunities should be tailored to the diverse literacy needs, competency levels, local context and evolving technological landscapes to foster meaningful participation.

(c) All stakeholders should have equal access to capacity-building opportunities, ensuring all individuals can engage in and benefit from smart city initiatives.

(d) Collaborative partnerships and collaborations across sectors should be fostered to enhance digital capacity of all levels of governments and general public and create a supportive learning ecosystem.

(e) Lifelong learning, intergenerational, interdisciplinary and continuous upskilling opportunities should be promoted to develop advanced digital skills.

(b) Actions

73. All stakeholders in the smart city's ecosystem should promote collaboration with other relevant stakeholders and ensure meaningful and responsible community participation and involvement for the successful design, implementation, and sustainability of any smart city initiatives, including policies, projects, services and other solutions.

74. All stakeholders in the smart city's ecosystem should collaborate to ensure equal access to learning opportunities at all levels, aiming to address the digital skills gap, while adapting programs to diverse needs, digital literacy and learning styles so to promote basic and advanced digital upskilling opportunities.

75. Building the appropriate capacity and skills for people-centred smart cities is critical, including by promoting digital literacy, education and the training of the officials and technical staff of national, regional and local authorities and governments in digital transformation, digital accessibility, data governance, smart city planning and digital public participation, among others, leaving no one behind.

76. National governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Develop national and local strategies and initiatives to promote digital literacy and innovation targeting public sector officials and general public, with a focus on groups with lower digital literacy.

(b) Adapt or develop competency frameworks for both public sector officials and residents, with the twofold goal of first develop inclusive, trusted, secure and user-centred smart city services[64] and secondly, ensuring that everyone has the skills and knowledge to safely and critically interact with content and information online and to make informed choices and provide or withdraw informed consent[65].

(c) Integrate digital skills training and curricula into education systems and public programs, tailoring them to specific groups such national, regional and local authorities and governments, women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations.

(d) Establish partnerships and investment strategies to enhance educational cooperation between governmental entities at all levels, increase the financial capacities of dedicated governmental bodies and local authorities, enabling them to invest in the capacity development and digital literacy of both public officials and residents.

(e) Leverage online platforms, tools and resources in diverse languages and accessible formats[66] for open, scalable and accessible learning programmes.

77. Local and regional governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Offer basic digital skills training for residents, focusing on data use, data protection, accessing digital services, and cybersecurity, particularly in low-income neighborhoods and for those in vulnerable situations.

(b) Establish hubs of digital capabilities and skills to promote a consolidated people centred approaches in the development of technology and a common understanding of technology use for urban development.

(c) Enhance local authorities' capabilities through training, mentorship, and peer-learning opportunities on digital technologies, digital twins, data, innovation, and related digital infrastructure and platforms, among others.

(d) Facilitate participation in collaborative initiatives, such as public-private partnerships, open-source communities, and local networks.

(e) Conduct local needs assessments and evaluations to tailor training programs, identify gaps, and monitor progress through key performance indicators and benchmarks.

(f) Develop targeted local digital literacy programs for specific groups such as older persons, caregivers, persons with disability, among others.

(g) Enhance skills and knowledge of local public officials on digital data management and implementing processes to oversee the entire data lifecycle (collection, storage, sharing, and deletion).

78. Relevant stakeholders are encouraged to work together to:

(a) Deliver digital training, mentorship and peer-learning opportunities and platforms that are tailored to learning needs and capacities of beneficiaries in communities.

(b) Establish metrics and processes to rigorously monitor the digital skills gaps and trends to identify capacity and skills needs, strengths and gaps [67].

(c) Promote open access to digital educational services, tools and information.

(d) Deliver localized digital literacy programs tailored to community needs.

(e) Facilitate dynamic and lifelong digital learning aimed at enhancing digital literacy and skills through local partnerships, including academic programs.

[64] Ibid.

[65] Ibid.

[66] Ibid.

[67] UN-Habitat, World Smart Cities Outlook 2024, p.38.

(f) Deliver educational programs, training and learning initiatives for the general public and public officials.

(g) Offer upskilling and vocational training in all urban sectors on digitalization and automation.

4. Budgeting and Financing

79. Effective and sustainable financing and budgeting frameworks are essential for the successful development and deployment of smart city tools and services. Budgeting ensures that financial resources are planned and aligned with urban priorities, while financing strategies enable long-term transformation by securing sufficient resources. Agile, inclusive, and sustainable procurement processes ensure that innovations are accessible, scalable, and adaptable to local needs while promoting environmental and economic sustainability. Sufficient and long-term financial resources are required to support the design, implementation, and maintenance of digital infrastructure and services.

80. Within this framework, procurement serves as the operational mechanism, ensuring that financial resources are efficiently and transparently translated into people-centered urban solutions. To foster innovation, optimization, improved financial management and inclusivity, governments should modernize procurement regulations, lower barriers for small businesses and start-ups, and adopt flexible, forward-looking funding models. By aligning budgeting, financing and procurement practices with sustainability and inclusivity goals, smart cities can drive meaningful progress toward resilient, people-centred urban development.

(a) Principles

(a) Integrated, data-driven, and transparent budgeting is a strategic enabler of smart city development, aligning expenditures with long-term urban priorities and ensuring fiscal sustainability.

(b) Smart city initiatives require comprehensive, long-term funding programs and financing models also adapted to resource constraints contexts that support the design, delivery, and maintenance of digital infrastructure and services moving beyond fragmented, short-term funding schemes.

(c) Procurement processes should be flexible, inclusive, and sustainable to ensure that smart city innovations are accessible to all, support economic and environmental sustainability, avoid duplications and vendor lock-in practices.

(d) Procurement frameworks should be modernized to adopt innovative sourcing practices that promote fair competition, in-country interoperability and collaboration.

(e) Procurement frameworks shall be modernized to adopt innovative sourcing practices that promote fair competition, within state interoperability and collaboration. This includes enabling early-stage innovators to participate alongside established corporations and encouraging public-private partnerships, green bonds and alternative financing.

(b) Actions

81. National governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Establish regulations and policies for public procurement of digital technologies, including standard clauses for the procurement of new and emerging technologies, enforcing clauses on accessibility and sustainability, and conducting human rights due diligence.

(b) Prioritize procurement of scalable open-source solutions and locally driven innovation, supporting initiatives that stimulate local economic growth.

(c) Promote green procurement by integrating environmental sustainability criteria into procurement processes, prioritizing digital products and services that are environmentally friendly and energy efficient.

(d) Ensure public benefits of digital infrastructure provided by a third-party benefit, especially for people and communities through establishing provisions related to transparency, disclosure of economic benefits, and public control over data.

(e) Explore alternative business models, such as public-private partnerships (PPPs) and community-driven solutions, that ensure the sustainable and equitable development of digital infrastructure and services.

(f) Fund for digital technology research development and prototyping and partnership with the private sector, supporting sustainable funding mechanisms for the deployment and operation of sustainable smart city tools.

(g) Put in place legal structures to finance digital technology products and solutions including Public-Private Partnership models.

82. Local and regional governments in cooperation with other spheres of government and relevant partners are encouraged to:

(a) Align procurement practices with national regulations, or establish local standards where necessary, to guide smart city technology procurement with social, ethical, and environmental criteria.

(b) Create financial frameworks to support local community and civil society-led digital infrastructure projects through community-based financing, microfinance, and participatory budgeting.

(c) Develop diverse local financing models that include multiple funding sources, revenue-generating contracts, cost-benefit analysis, and scalability strategies.

(d) Co-finance physical infrastructure such as sensors and data centers, ensuring privacy and security are key conditions for investment agreements.

(e) Run open innovation and innovation-based procurement to involve micro-, small and medium-sized enterprises, start-ups, and community organizations in smart city projects.

(f) Leverage procurement to foster innovation by using methods like challenge-based innovation, performance-based contracting, design contests, and pre-commercial procurement.

83. Relevant stakeholders are encouraged to work together to:

(a) Conduct research and innovation to support sustainable digital infrastructure and service development, focusing on ethical, social, and environmental impacts.

(b) Develop and promote evidence-based procurement policies that integrate sustainability, accessibility, and human rights due diligence.

(c) Provide capacity-building programs (e.g. training, mentorship, knowledge-sharing) for local governments, micro-, small and medium-sized enterprises and start-ups to enhance their participation in smart city funding and opportunities.

(d) Support public-private partnerships by co-financing projects, providing technological expertise, and ensuring compliance with privacy, security, and sustainability standards.

(e) Explore alternative financing models, such as performance-based contracts, green bonds, and revenue-sharing agreements, to promote long-term sustainability.

(f) Invest in research, development, and prototyping of environmentally sustainable technologies that align with smart city goals.

III. Implementation and Monitoring

84. To ensure successful implementation of the International Guidelines, it is recommended to follow a systematic step-by-step process that adapts the principles to the specific needs of different countries, cities and communities. This process involves three key steps:

(a) Baseline Assessments;

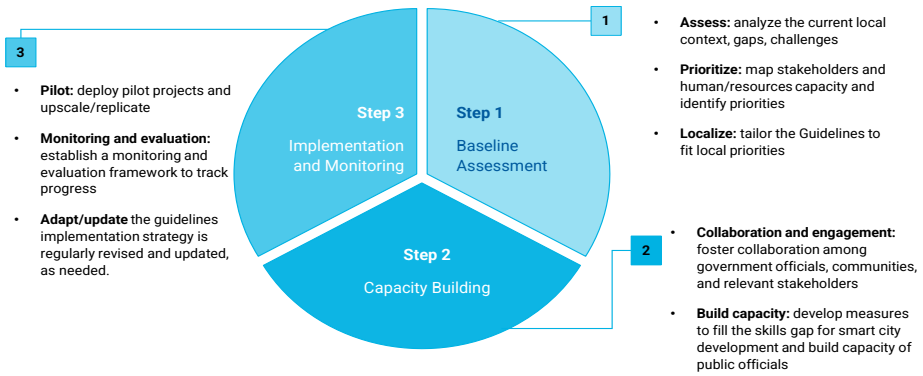
(b) Capacity Building; and

(c) Implementation and Monitoring.

85. Each step is designed to align the Guidelines with local contexts, empower stakeholders through participatory approaches, training and collaboration, and facilitate application and evaluation. By following these steps, actors can foster innovation, strengthen governance, and create resilient, inclusive urban environments that leave no one and no place behind. While the Table below provides an overview of the main actions, actors can follow, those are indicative and require ad- hoc analysis and dedicated technical assistance.

Figure 2

Step by step approach to implement the guidelines



Approach and actions to implement the Guidelines

Step	*Objective*	*Actions*
Step 1: Baseline Assessments Understand local contexts, map stakeholders and identify priority areas.		
Action 1.1: Assess: • Evaluate the current state of digital infrastructure, governance frameworks, urban planning and participatory practices. • Analyze local challenges such as gaps in technology, social inclusion, and sustainability efforts. • Map key stakeholders, including local authorities, civil society, private sector, and persons in vulnerable situations.	**Action 1.2: Prioritize:** • Use the baseline assessment to identify the key areas for improvement in smart city governance, technology integration. • Establish clear objectives based on the specific needs of each city, considering local social, environmental, and economic factors.	**Action 1.3: Localize the Guidelines:** • Adapt the Guidelines to align with local challenges and opportunities identified, ensuring flexibility to fit the unique needs of each city. • Customize key focus areas such as digital inclusion, urban resilience, and sustainable development to match the priorities of local communities.
Step 2: Capacity Building Equip stakeholders with the knowledge, tools, and skills necessary for effective implementation.		
Action 2.1: Collaboration and engagement: • Organize community forums to involve people and local communities, including women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations, in the decision-making processes. • Create partnerships between governments, communities and relevant stakeholders to leverage technical expertise and innovative solutions. • Encourage knowledge-sharing platforms that facilitate peer-learning and information exchange.	**Action 2.2: Build capacity:** • Provide workshops and online courses to strengthen understanding of inclusive and people-centred urban development • Develop tailored capacity building programs for local authorities on smart city planning, digital and data governance, sustainability etc	

Step	*Objective*	*Actions*
innovation and collaboration across sectors. • Focus on digital literacy programmes to empower vulnerable communities to participate in smart city initiatives and access digital services**.** • Promote international good practices exchange in people centred smart cities development		
Step 3: Implementation and Monitoring Adopt the Guidelines through practical applications and establish mechanisms to monitor progress and impact.		
Action 3.1: Pilot: • Adopt the Guidelines, prioritizing initiatives that address challenges such as digital inclusion, sustainability, or resilience, among others. • Test new technologies, deploy tools such as digital platforms for urban management (urban observatories or real-time data systems/platforms) to monitor key metrics like energy consumption, air quality, mobility, • Develop frameworks aligned with the principles of the Guidelines to assess their effectiveness and scalability.	**Action 3.2: Monitoring and Evaluation (M&E):** • Set up a monitoring framework with Key Performance Indicators (KPIs) to track progress towards inclusive, resilient and sustainable digital transformation. • Conduct regular evaluations to measure the impact of Guidelines, allowing for course correction and refinement. • Use data collected from the pilot projects and ongoing initiatives to guide future implementations and inform policy decisions.	**Action 3.3 Adapt/update:** The guidelines implementation strategy regularly, as needed

86. Further, UN-Habitat, in collaboration with relevant stakeholders, aims to support the implementation of the guidelines globally through the following ways:

(a) Facilitating diagnostics to evaluate cities and countries' readiness to adopt the principles of the guidelines.

(b) Promoting people-centred smart cities impact assessments to review the societal, environmental, and economic impacts of digital technologies and related policies.

(c) Enhancing knowledge, skill and capacities to mainstream, implement, and monitor the guidelines.

(d) Partnerships to apply the principles and enablers of these guidelines also to promote scalability and replication of successful models.

(e) Monitoring progress with the implementation of the principles through global data and review of practices including through the World Smart Cities Outlook.

(f) Global advocacy and mobilization through networks of cities, countries, and partners committed to advancing the guidelines.

Annex

Glossary

Term	*Definition*
Artificial Intelligence (AI)	Technology that enables machines and software to perform tasks typically requiring human intelligence, such as decision-making, language understanding, and data analysis.
Artificial intelligence systems	Programmes or algorithms that analyze data to recognize patterns, make predictions, or automate decision-making.
Assistive technologies	Products, equipment, and systems that improve the functionality and quality of life for persons with disabilities giving access to learning, working, and daily living necessities.
Automated decision-making	Decisions made by systems or algorithms with no human intervention.
Big data	Large and complex datasets characterized by high volume, velocity, variety, and variability, requiring advanced methods to process and analyze.
Cybersecurity	Practices and measures to protect networks, data, and systems from unauthorized access and threats to confidentiality, integrity, and availability.
Community-based financing	Financial models driven by community involvement, such as participatory budgeting, where residents influence spending decisions.
Data governance	Policies and procedures to ensure data is collected, managed, and used ethically and securely, protecting privacy and ensuring accountability.
Data platforms	Digital infrastructures used for data collection, storage, processing and sharing to support decision-making and the development of smart city tools and services
Data sharing agreement	A formal contract that specifies the requirements for sharing data between two parties. The contract clearly documents what data is being shared and sets parameters for the use of data, data transmission, security, storage and destruction between any two parties that collect and/or manage data
Data stewards	Individuals designated to manage data governance activities within their department or organization
Data sovereignty	The idea that data is subject to the laws and governance structures that govern where it is collected.
Digital infrastructure	Fundamental digital services such as broadband networks, data centers, and cloud services that support digital activities and services.
Digital inclusion	Ensuring equitable access to digital technologies, services, and literacy, particularly for women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations, and underserved communities.
Digital identification	A digital identity is a collection of features and characteristics associated with a uniquely identifiable individual — stored and authenticated in the digital sphere — and used for transactions, interactions and representations online
Digital literacy	The ability to use information and communication technologies to find, evaluate, create and communicate information, requiring both cognitive and technical skills.
Digital public goods	Open-source resources, such as software, data, and models, that adhere to privacy and security standards and promote the Sustainable Development Goals (SDGs).
Digital services	The electronic delivery of information including data and content across multiple platforms and devices like the web or mobile. Digital services can be provided by any sector, public or private, that uses the internet to deliver information
Digital skills	A range of abilities to use digital devices, communication applications, and networks to access and manage information.
Digital twin	A virtual representation of a physical object, system, or process that mirrors its real-world counterpart in real-time. Digital twins use data collected from sensors and other sources to simulate, monitor, analyze, and optimize performance, enabling predictive insights and improved decision-making across sectors such as urban planning, resource management, and infrastructure development.
Digital transformation	The process of integrating digital technologies into all aspects of organizations, governments and societies, changing how services are delivered, operations are managed, and value is created. It involves adopting digital tools, data-driven

Term	*Definition*
	processes, and innovative technologies to improve efficiency, enhance user experiences, and drive sustainable development.
Digitalization	Refers to the use of digital technologies to change an operating model and transform operational processes, providing additional revenue and value producing opportunities.
E-waste	Discarded electronic equipment and devices.
Interoperability	Refers to the ability of multiple technology systems to exchange information and to use the information that has been exchanged within the same state, including across the same level of government or between national, regional, and local governments. It does not extend to cross-border exchanges unless explicitly governed by specific agreements or legal frameworks.
Metadata	Provides a structured reference to the data collected that helps to sort and identify attributes of the information it describes
Media and information literacy	A set of essential skills to engage critically with information, navigate the online environment safely and responsibly and ensure there can be trust in our information ecosystem and in digital technologies
Open data	Data that is freely available online for anyone to access, use, modify, and share without restrictions, provided it complies with privacy, security, and legal standards. Open data is designed to promote transparency, innovation, and collaboration across sectors.
Open data platforms	Digital platforms designed to collect, store, publish, and provide access to open data in standardized, machine-readable formats. These platforms facilitate data sharing, interoperability, and the development of data-driven solutions, supporting transparency, innovation, and evidence-based decision-making.
Open standards	Standards available to the public, developed (or approved) and maintained via a collaborative and consensus-driven process. Open standards facilitate interoperability and data exchange among different products or services.
People-Centred Approach	Approaches and practices that prioritize the needs, rights, and well-being of individuals and communities in the design and implementation of smart city initiatives, technologies and participatory mechanisms.
Smart Cities	Urban areas that use digital technology and data-driven solutions to improve the quality of life, efficiency of urban operation and services, and promote sustainability and inclusivity, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects.
Smart City tools	Software, applications and platforms developed by a smart city that leverages technology to address sustainable development challenges.
Vendor lock-in	A situation in which a customer using a product or service cannot easily transition to a competitor’s product or service