



# International Guidelines on People-Centred Smart Cities

*“Smart Cities for People: empowering lives, protecting the planet, advancing prosperity”.*

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## 1. Introduction

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<sup>1</sup>, digitally enabled solutions are essential to drive impact at scale towards sustainable cities and human settlements.

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<sup>2</sup>. Today, 2.6 billion people still lack affordable access to the internet<sup>3</sup> 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.<sup>4</sup> In cities, the digital divide manifests also between and within communities, hindering inclusive digital transformation and deepening existing inequalities.<sup>5</sup>

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<sup>6</sup>. 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.

Following this introduction, the guidelines are structured as follows:

1. Objectives (paragraph 1.1) which specifies the purpose of these guidelines
2. The Guidelines development process (paragraph 1.2), describing the comprehensive and inclusive approach that led to the guidelines.
3. 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.

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<sup>1</sup> UN-Habitat, SDG11 Synthesis Report 2022, <https://unhabitat.org/sdg-11-synthesis-report>

<sup>2</sup> General Assembly A/79/L.2, [The Pact of The Future, Annex I: Global Digital Compact](#).

<sup>3</sup> [ITU's Facts and Figures 2024](#)

<sup>4</sup> UN-Habitat, [World Smart Cities Outlook 2024](#)

<sup>5</sup> UN-Habitat, [Global assessment of Responsible AI in cities](#), 2024

<sup>6</sup> UN-Habitat Assembly Resolution 2/1, [https://unhabitat.org/sites/default/files/2023/09/english\\_9.pdf](https://unhabitat.org/sites/default/files/2023/09/english_9.pdf)

4. 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.
5. Monitoring and Evaluation (paragraph 3) which highlights mechanisms to measure progress and foster continuous improvement.
6. Annex which includes a glossary.

## 1.1 Objectives

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<sup>7</sup>, 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.<sup>8</sup>

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.<sup>9</sup>

The guidelines serve as a reference for Member States<sup>10</sup> 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.<sup>11</sup>

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<sup>12</sup>. 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, and local action, in advancing people-centred smart city development also towards the vision of global digital compact.

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<sup>7</sup> This applies to cities of all scales and sizes including villages and urban areas and their peri-urban and rural surroundings

<sup>8</sup> Paris Agreement; the Sendai Framework; Beijing Declaration etc.

<sup>9</sup>

[UN-Habitat Assembly Resolution 2/1](#), 2023

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

<sup>11</sup> [UN-Habitat Assembly Resolution 2/1](#), 2023

<sup>12</sup> 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](#).

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 legislation, laws and governing structures as well as with international law.

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;
- (c) Serve as a reference for Member States to implement people-centred smart city approaches in smart city regulations, plans and strategies
- (d) advance a people-centred smart city approach to accelerate the implementation of the Global Digital Compact at the local level<sup>13</sup>;
- (e) foster global cooperation and knowledge sharing among relevant stakeholders connecting global visions with local implementation.

## 1.2 The Guidelines Development Process

The development of the International Guidelines on People-Centred Smart Cities was carried out through a comprehensive and inclusive process also as per the request of the second session of the United Nations Habitat Assembly.<sup>14</sup> This provided an opportunity to consider diverse perspectives and contextual realities, across geographic regions, stakeholder groups, and thematic areas.

The Executive Director of UN-Habitat appointed 31 experts nominated by Member States as part of the Expert Working Group<sup>15</sup>, balancing geographical, gender and expertise considerations. This group served as the primary advisory body for drafting the guidelines, providing continued and sustained guidance through regular monthly meetings and three extended in-person and virtual global Expert Group Meetings (EGMs).<sup>16</sup>

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 regional context. An in person regional consultation was also held in person in Bratislava (Slovakia) in January 2025.

Several targeted stakeholder engagements took place including with civil society organizations, academia, local and regional governments, international organizations, private

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<sup>13</sup> General Assembly A/79/L.2, [The Pact of The Future, Annex I: Global Digital Compact](#)

<sup>14</sup> [UN-Habitat Assembly Resolution 2/1](#)

<sup>15</sup> The full list of experts can be found [here](#)

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

sector, UN-Habitat stakeholder Advisory Groups and UN-Habitat staff<sup>17</sup>. In addition, an open online public consultation invited external stakeholders<sup>18</sup> as well as one thematic consultation on the linkages between technologies and climate resilience.

The Guidelines are also informed by field projects, lessons learned, and normative work carried out under UN-Habitat's People-Centred Smart Cities Flagship Programme<sup>19</sup>. Further, the World Smart Cities Outlook 2024<sup>20</sup> provided a data-driven foundation, offering insights into global trends, regional challenges, and opportunities in smart city development. The evidence pointed to the need for digital solutions that prioritize inclusion, safety, resilience and sustainability, with respect for human rights for inclusive cities, while addressing local realities and capacities.

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

Cognizant of the fast-evolving pace of technology and digital transformation, it would be important to consider revisiting and updating the International Guidelines to capture emerging challenges, opportunities and lessons to ensure that they remain relevant, effective and adaptable globally.

### 1.3 Definition of People-Centred Smart Cities

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<sup>21</sup>. It promotes and protects*

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<sup>17</sup> 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, 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.

<sup>18</sup> Online consultation webpage available [here](#)

<sup>19</sup> <https://unhabitat.org/programme/people-centred-smart-cities>

<sup>20</sup> UN-Habitat, [World Smart Cities Outlook 2024](#).

<sup>21</sup> [New Urban Agenda](#) and Global Digital compact

*human rights and fundamental freedoms, to bridge digital divides, with **multi-level governance systems** and regulations ensuring that technology supports sustainable development rather than becoming the goal itself”.*

This definition represents a new paradigm and reflects a shift from a technology-driven<sup>22</sup>, approach to a focus on people’s needs to enhance the quality of life for all residents while addressing broader societal and environmental challenges. 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.

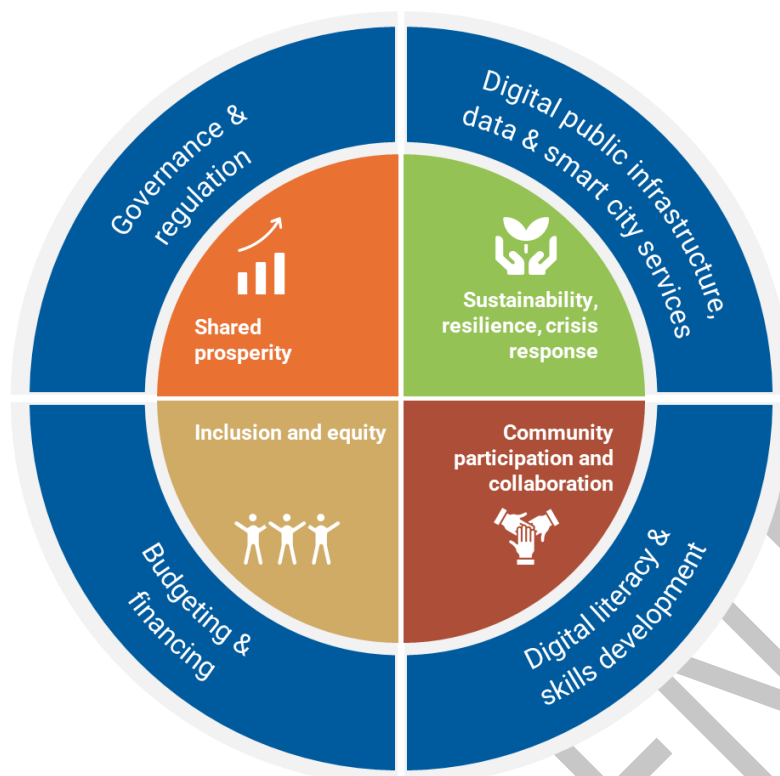
## 2. International Guidelines on People-Centred Smart Cities

The Guidelines are organized into eight pillars: **four thematic pillars** which outline the core principles and **four enabling pillars** which list essential conditions to mainstream the principles of the thematic pillars. (see Figure 1). However, although distinct, all eight areas are interconnected and mutually reinforcing, requiring a holistic approach and collaboration across all stakeholders. Each area outlines recommended actions that Member States - along with national, local, and regional governments, as well as other stakeholders - can take to uphold and implement these principles.

*Figure 1 – thematic areas and enablers of the guidelines*

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<sup>22</sup> 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)



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

Governments, at all levels, are key players in promoting a people-centred smart city approach. Therefore, the

guidelines define recommended actions specific to national and local and regional governments, recognizing the different roles they can play in this domain. 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.

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 national and local governments, the private sector, academia, and civil society (referred to as “all relevant stakeholders”) to co-create solutions that prioritize inclusivity, safety, resilience and sustainability. To be effective, all stakeholders share the responsibility of implementing the principles and are encouraged work cohesively toward their adoption.

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.



## 2.1 Thematic Pillars

### 2.1.1 Shared Prosperity

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, and human settlements 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.

#### *Principles*

1. **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.**
2. **Holistic and sustainable digital solutions address socio-economic and geographic disparities for the benefit of all people in cities and human settlements.**
3. **Innovation ecosystems promote local entrepreneurs, micro-, small and medium-sized enterprises, and start-ups to create solutions that address community needs.**
4. **Digital technologies support integrated urban and territorial planning, increasing rural-urban linkages and synergies.**
5. **Urban data collection and predictive analysis are harnessed to inform policymaking and investments for sustainable urban and territorial development.**
6. **Digital technologies are leveraged for increased efficiency across all sectors of the economy, harnessing data-driven insights for sustainable urban development.**

#### *Actions*

All relevant stakeholders in the smart city ecosystem are encouraged to foster **inclusive economic growth** and **balanced regional and territorial development across the rural-urban continuum** including by promoting innovation and locally driven initiatives, local entrepreneurship and competitiveness, to generate economic benefits for local people and communities, especially for persons in vulnerable situations, addressing socio-economic inequalities and contributing to contribute to sustainable and resilient cities and communities.

1. *National governments in cooperation with other levels of government and relevant stakeholders are encouraged to:*
  - *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.*<sup>23</sup>

- **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 or remote areas.
- **Create long-term financial frameworks** for the sustainability and scalability of smart city solutions, leveraging alternative funding sources<sup>24</sup> for the continuation of projects beyond piloting, while still supporting new entrepreneurial efforts.
- **Provide appropriate fiscal incentives and targeted subsidies** to enhance local fiscal capacities that empower local authorities to develop technology solutions.
- **Update procurement processes** promoting participation of local businesses as well as interoperable technical formats that facilitate secure and transparent data-sharing, for effective policy and governance of smart city development including knowledge among public and private parties<sup>25</sup>, in compliance with national and international data protection laws, trade agreements and intellectual property regulations.
- **Monitor the impact of the digital economy**<sup>26</sup> 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.

2. **Local and regional governments** in cooperation with other levels of government and relevant partners are encouraged to:

- **Leverage digital technology for local economic development** including for job creation, revenue enhancement, higher productivity and increased investments that foster community well-being.
- **Develop effective frameworks** to advance the local digital economy, supporting public-private partnerships, local entrepreneurship and industries.
- **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.
- **Connect economic growth** with urban and territorial policies by integrating smart city strategies that promote equitable spatial development.
- **Boost local businesses and industries**, micro-, small and medium-sized enterprises and community-based businesses leveraging digital technologies.
- **Transform the informal economy** through technology and data-driven strategies that promote local job creation and productivity.
- **Create incentives for actors** including through skills enhancement, innovation acceleration, and open-source innovation to foster local solutions.

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<sup>23</sup> General Assembly A/79/L.2, [The Pact of The Future, Annex I: Global Digital Compact](#)

<sup>24</sup> Refer to the Governance and regulation section and the financing for some examples

<sup>25</sup> UN-Habitat, [World Smart Cities Outlook 2024](#), p. 79

<sup>26</sup> 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.

- **Support the care economy** by designing smart city services that reduce spatial inequalities and improve the quality of life for families, caregivers, youth, older persons, and persons with disabilities, among others.
- **Promote a culture of innovation in the local economy**, including promoting and supporting the adoption of digital technologies and data use by local industries, enterprises, and entrepreneurs.
- **Implement dedicated programs** to support **grassroots initiatives** and **entrepreneurial ventures** using digital and social innovation.

### 3. Other relevant stakeholders are encouraged to work together to:

- **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.
- **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<sup>27</sup>.
- **Channel resources and investments** into local digital infrastructure, smart city solutions, and entrepreneurship initiatives to create sustainable and decent jobs and support underserved communities.
- **Develop open-source, user-friendly digital tools** that address local challenges and enhance inter-municipal cooperation.
- **Establish open-access knowledge hubs and platforms** to disseminate inspiring practices and solutions, lessons learned, and scalable models.

#### 2.1.2 Sustainability, Resilience and Crisis Response

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

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.

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<sup>27</sup> UN-Habitat, World Smart Cities Outlook 2024.

## Principles

1. Digital infrastructure and technologies are designed to contribute to reducing the environmental impact of cities and minimizing the pollution and the consumption of natural resources caused by digitalization itself.
2. Digital technologies and data leveraged for proactive urban disaster risk response, reduction and management of natural and human-made disasters and conflicts including humanitarian crisis, as well as mitigation of and adaptation to climate change.
3. Digital tools and services in urban development promote responsible and efficient use of technology through sustainable lifecycle practices, including sustainable resource management and e-waste reduction practices.
4. 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.<sup>28</sup>
5. Digital infrastructure and data platforms for smart city development require disaster recovery plans, security protocols, and data governance frameworks to ensure resilience, public safety and functionality even when systems are disrupted.

## Actions

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

1. **National governments** in cooperation with other levels of government and relevant partners are encouraged to:
  - **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,<sup>29</sup> and e-waste management.
  - **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.

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<sup>28</sup> UNHA Resolution "Biodiverse and resilient cities: mainstreaming biodiversity and ecosystem services into urban and territorial planning" HSP/HA.2/Res.4

<sup>29</sup> UNHA Resolution "Biodiverse and resilient cities: mainstreaming biodiversity and ecosystem services into urban and territorial planning" HSP/HA.2/Res.4

- **Empower national regulatory bodies** to assess and monitor that urban digital infrastructure contributes to reducing the environmental impact of cities and minimizes the pollution and the consumption of natural resources caused by digitalization itself throughout the product lifecycle, and across both sectors and government levels.
  - **Mainstream sustainability principles in national smart city strategies**, such as eco-design, into national and local digital transformation, environmental and sector-specific strategies.
  - **Provide fiscal incentives** for investments in sustainable digital infrastructure, renewable energy, and eco-friendly technologies for urban development.
  - **Promote green procurement** to prioritize digital products and services that are environmentally friendly and energy-efficient.
  - **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<sup>30</sup>.
  - **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.
  - **Establish contingency plans for critical digital infrastructure and services** to ensure service continuity during climate and humanitarian crises and cyber threats.
2. **Local and regional governments** in cooperation with other levels of government and relevant partners are encouraged to:
- **Reduce GHG emissions and mitigate the environmental impact of cities** in key sectors like construction, transportation, and energy through technology and data-driven solutions and renewable energies<sup>31</sup>.
  - **Use digital platforms for urban disaster prevention, mitigation and preparedness** by strengthening evidence-based land-use planning, early warning systems, and real-time monitoring of crises<sup>32</sup>.
  - **Promote biodiversity and ecosystem protection, restoration** in urban development through digital technologies.
  - **Promote sustainable resource management practices locally** by encouraging resource efficiency, reuse, recycling, and sustainable lifecycle management of digital tools and infrastructure.
  - **Adapt contingency plans to ensure critical digital services and infrastructure** remain secure and operational during climate events, cyber threats, and humanitarian crises, .

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<sup>30</sup> UNFCCC, The Paris Agreement

<sup>31</sup> UNFCCC, The Paris Agreement

<sup>32</sup> For example, local digital twins, urban observatories etc.

3. *Relevant stakeholders are encouraged to work together to:*

- **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<sup>33</sup>.
- **Develop sustainable digital solutions and smart city innovations** that mitigate environmental challenges posed by digital infrastructure.
- **Strengthen corporate sustainability** by adopting environmentally responsible practices and initiatives aimed at reducing resource consumption and fostering sustainable resource management models.
- **Invest in and promoting green technologies**, promoting clean and renewable energy sources to manage energy consumption of digital infrastructure and platforms
- **Conduct research on prototype tools** that promote sustainable digital transitions, including energy-efficient algorithms and eco-conception in digital tools
- **Conduct environmental impact assessment of digital tools and infrastructure** and recommend improvements in energy consumption, e-waste management and resource conservation.
- **Promote capacity development and skills enhancement** for to design and manage environmentally responsible technologies.

### 2.1.3 Community Participation and Collaboration

Centring smart city activities on people's needs by maximizing transparency as well as community participation, representation and control is an important pillar of people-centred smart cities. Digital public participation, 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 and leave no one behind.

Continuous and active engagement with them communities in various phases of smart city development<sup>34</sup> and through a variety of communications channels is key to ensure that policies, initiatives and solutions are aligned with the needs and values of local communities, while fostering trust among stakeholders.

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<sup>33</sup> 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.

<sup>34</sup> UN-Habitat, [World Smart Cities Outlook 2024](#), p.38

## Principles

1. **People and communities are actively involved in identifying challenges, providing input to strategic goals setting, and co-designing smart city solutions from the inception phase.**
2. **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.**
3. **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.**
4. **Establishing structured feedback mechanisms, performance metrics and impact assessments ensures that community input shapes policy decisions and project implementation.**
5. **Multi-level, multi-sectoral and multi-stakeholder collaboration and knowledge exchange is promoted to encourage diverse and inclusive participation, ensuring that smart city solutions are inclusive, responsive, relevant and community driven.**

## Actions

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. Mechanisms should be in place to broaden inclusive platforms for meaningful community participation decision-making, planning and follow-up processes contributing to transparency, accessibility and long-term sustainability of smart city initiatives.

1. **National governments** in cooperation with other levels of government and relevant partners are encouraged to:
  - **Mainstream community participation and collaboration in national and city digital strategies to ensure a people-centred approach.**
  - **Develop legal and institutional frameworks and general guidelines to enhance community participation and partnerships, public consultation, and public data and information in order to increase transparency, digital security and inclusion.**
2. **Local and regional governments** in cooperation with other levels of government and relevant partners are encouraged to:
  - **Define and implement guiding principles for community participation in smart city initiatives, ensuring real-time updates and structured feedback loops that regularly inform the general public and residents on progress.**
  - **Develop participatory platforms and tools for smart city initiatives with accessible features and format formats responding to different needs and abilities to ensure inclusion and reduce barriers for participation.**



- **Appoint advisory councils and public officials** to strengthen engagement with community organizations and leaders engaged in smart city initiatives.
- **Monitor barriers to community participation** including digital literacy, accessibility, information, language and others and developing measures to address them.
- **Create feedback mechanisms (online and offline)** 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.
- **Use public feedback and metrics** to evaluate the impact and efficiency of smart city interventions locally.

### 3. **Relevant stakeholders** are encouraged to work together to:

- **Advocate for greater community participation and public sector accountability** for smart city initiatives, including ensuring continued and open communication.
- **Develop digital platforms and tools for public participation** for the co-design and evaluation of smart city initiatives, especially for persons in vulnerable situations.
- **Empower people and communities to access and use urban data** to address urban challenges and be involved in smart city initiatives through co-creation.
- **Conduct assessments** to identify community participation gaps and accessibility barriers as well as user-experience tests and impact evaluation and uptake by local communities.
- **Promote research and innovation** including the establishment of innovation and community hubs to drive community-centred solutions.
- **Foster public trust** to facilitate the adoption of emerging technologies through community participation and public-private partnerships.
- **Promote the development of collaborative physical and digital spaces** to support the co-design of smart city tools and services with local communities.
- **Participate in the preparation, implementation and monitoring** of consultation processes in smart city initiatives to increase community participation and collaboration.

#### 2.1.4 Equity and Inclusion

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<sup>35</sup>.

#### **Principles**

1. **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**

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<sup>35</sup> [UN-Habitat Assembly Resolution 2/1, 2023](#)



collection, processing, retention, sharing or use of personal data by individuals, governments, business enterprises and private organizations.<sup>36</sup>

2. **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.**<sup>37</sup>
3. **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<sup>38</sup>, to prevent discrimination, exclusion and other potential harm, particularly for persons in vulnerable situations persons in vulnerable situations.**
4. **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<sup>39</sup>.**
5. **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<sup>40</sup>.**

## **Actions**

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, promote and protect human rights and fundamental freedoms, including full respect for international law and the Universal Declaration of Human Rights.

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.

Independent, effective, adequately resourced and impartial judicial, administrative and/or parliamentary domestic oversight mechanisms need to be established or maintained to

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<sup>36</sup> [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)

<sup>37</sup> Ibid.

<sup>38</sup> Ibid.

<sup>39</sup> [UN-Habitat Assembly Resolution 2/1](#), 2023

<sup>40</sup> Ibid.

ensure transparency, as appropriate, and accountability for State surveillance of communications, their interception and the collection of personal data<sup>41</sup>.

1. **National governments** in cooperation with other levels of government and relevant partners are encouraged to:

- **Protect and promote human rights and fundamental freedoms**, into all digital technology regulations, policies, and processes, including privacy and data protection to safeguard individuals from violations and harmful impacts of emerging technologies.
- **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, addressing, in particular against women and children, while safeguarding privacy, dignity, security, and personal integrity.
- **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<sup>42</sup>.
- **Establish regulatory guidance and oversight in line with ethical considerations regarding technologies such as artificial intelligence**, including frameworks for impact assessment, data protection due diligence throughout the lifecycle of technology use.
- **Safeguarding public trust** by putting cybersecurity measures in place that protect data and infrastructure, including trusted, secure and resilient digital infrastructure.
- **Develop national information and communications technology policies and e-government strategies**, in order to make information and communications technologies accessible to the public, to enable them to develop and exercise civic responsibility, broadening participation and fostering responsible governance, as well as increasing efficiency.<sup>43</sup>
- **Promote universal, affordable, and meaningful connectivity**<sup>44</sup> ensuring that digital infrastructure and smart city services are accessible to all, particularly persons in vulnerable situations, low-income and underserved communities.
- **Conduct regular digital inclusion assessments** to identify and address gaps in connectivity, accessibility, usage, digital literacy and infrastructure deployment.

2. **Local and regional governments** in cooperation with other levels of government and relevant partners are encouraged to:

- **Develop local legislation and institutional frameworks** to promote and protect human rights and fundamental freedoms, to bridge digital divides, to support, inter alia, the enjoyment of the rights of persons with disabilities, the advancement of gender equality

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<sup>41</sup> [UN-Habitat Assembly Resolution 2/1, 2023](#)

<sup>42</sup> Ibid.

<sup>43</sup> [New Urban Agenda](#)

<sup>44</sup> <https://www.itu.int/itu-d/sites/projectumc/home/aboutumc/>

and the empowerment of all women and girls, and to protect the right to privacy both online and offline<sup>45</sup>.

- **Develop local information and communications technology policies** and e-government strategies to make digital technologies accessible to the public, aligning to national frameworks.
- **Implement digital inclusion plans** with stakeholders to address gaps in connectivity, digital literacy, and accessibility, supported by community advisory mechanisms.
- **Invest in digital infrastructure** aimed at universal and meaningful connectivity through service provision regulation, incentives, and subsidies, particularly for persons in vulnerable situations.
- **Assess the digital divide** through local surveys and data analysis to identify disparities based on gender, age, location and others.
- **Make information and data about smart city initiatives available** to the public and raise awareness about people's rights, enabling informed and meaningful participation of all stakeholders while combating all forms of hate speech and discrimination, misinformation and disinformation, cyberbullying and child sexual exploitation and abuse.

### 3. **Relevant stakeholders** are encouraged to work together to:

- **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<sup>46</sup>.
- **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.
- **Conduct impact assessments, data protection due diligence, and algorithm risk mitigations** throughout the lifecycle of technology to evaluate adverse risks<sup>47</sup>, report potential violations and prevent adverse impacts<sup>48</sup>.
- **Analyze accessibility gaps and usability obstacles** for groups at risk of exclusion and adapting service design to meet their specific needs.
- **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.<sup>49</sup>

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<sup>45</sup> [UN-Habitat Assembly Resolution 2/1, 2023](#)

<sup>46</sup> Ibid.

<sup>47</sup> 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.

<sup>48</sup> UN-Habitat, [World Smart Cities Outlook 2024](#), p.78

<sup>49</sup> [UNESCO Guidelines for the Governance of Digital Platforms](#)

- **Develop transparency measures** for informed consent practices, and safeguards to protect personal data throughout the data lifecycle and appropriate measures adopted for people to amend, correct, update, delete and withdraw consent for the data.<sup>50</sup>
- **Provide access to effective remedy**<sup>51</sup> to put an end to violations of the right to privacy for users and to create conditions to prevent such violations, including by ensuring that relevant legislation complies with their obligations under international human rights law.
- **Facilitate the appropriate collaboration frameworks** between governments, the private sector, academia and civil society to promote and protect human rights and fundamental freedoms, including ethical considerations regarding technologies such as artificial intelligence, the privacy and human rights of individuals and communities.
- **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<sup>52</sup> human rights to protect individuals from digital threats and attacks.
- **Advocate for and implementing digital inclusion programs** for the meaningful engagement and benefit of women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations.

## 2.2 Enabling Pillars

### 2.2.1 Governance and Regulations

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 sustainability, resilience, and inclusion.

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<sup>53</sup>.

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, guaranteeing ethical use of emerging technologies, such as AI, and data platforms.

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<sup>50</sup> GA resolution A/RES/77/211

<sup>55</sup> [OHCHR Guiding Principles for Business and Human Rights](#)

<sup>52</sup> Ibid.

<sup>53</sup> [UN-Habitat Assembly Resolution 2/1, 2023](#)

## Principles

1. Institutional coordination mechanisms are established to align national and local smart city strategies, plans and investments ensuring that initiatives are coherent, place-based, community-led, and responsive to local contexts and needs.
2. All levels of government contribute to the development of robust and enabling regulatory frameworks that support consistent policies and processes for smart city development anchored in a people-centered approach.
3. National policies respect and preserve local autonomy by adhering to the principles of subsidiarity and proportionality, allowing local governments to adapt smart city regulations and set up independent oversight mechanisms adapted to their specific contexts<sup>54</sup>.
4. Regulatory arrangements are transparent and include mechanisms for independent oversight to ensure accountability and public trust in digital governance for smart cities.

## Actions

National, regional and local and local governments are primarily responsible for ensuring appropriate governance and institutional arrangements for smart city development. Facilitating appropriate multilevel digital governance to guide the development of people-centred smart cities is key, including data governance, management and use, system and data interoperability. Ensuring appropriate collaboration frameworks between governments and the private sector, academia and civil society who expected to provide skills and collaborate to design policies and regulations while abiding by them.

1. *National governments in cooperation with other levels of government and relevant partners are encouraged to:*
  - **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.
  - **Create a functional and multidisciplinary mechanisms** to align urban and territorial and digital policies and strategies enabling synergies and coordination across departments, units and administrations.
  - **Ensure adequate capacities, mandates and expertise** of public administrations to manage and oversee smart city projects/initiatives

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<sup>54</sup> UNESCO, [Guidelines for the Governance of Digital Platforms](#).

- **Develop and enact regulations, policies and standards** to govern digital technologies, infrastructure and data in alignment with obligations under international human rights law, respect and protection of the right to privacy online and offline, data protection.
  - **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<sup>55</sup>.
  - **Establish national policies, regulatory and governance approaches and frameworks** to promote open, safe, secure and trustworthy AI systems<sup>56</sup> deployment, including clear guidelines on accountability, bias prevention, and transparency.
  - **Ensure governance arrangements and processes for interoperability** of smart city technologies and data to facilitate the use of digital public goods across different platforms and systems, aligned with public administration needs.<sup>57</sup>
  - **Support the localization of national strategies, policies and legislation** at the local and regional levels, embedding them into local regulations, local development plans, smart city strategies, masterplans.
2. **Local and regional governments** in cooperation with other levels of government and relevant partners are encouraged to:
- **Develop Smart City and Data Strategies** to guide technology adoption, data governance, and privacy protection.
  - **Define clear roles and responsibilities** for managing digital technologies locally, enhancing interdepartmental collaboration, maintaining accountability and addressing overlaps and silos.
  - **Appoint specific dedicated unit** 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.
  - **Create multidisciplinary committees or taskforces** to support project design and deployment and promote collaboration within the local administration.
  - **Collaborate with other municipalities** to share resources, infrastructure and expertise for greater efficiency and expanded access to digital capabilities and digital public goods.
  - **Establish privacy, cybersecurity, and transparency protocols** to ensure residents can make informed decisions and opt in or out of digital services.
  - **Adopt secure interoperability standards** to facilitate safe data integration and digital exchanges according to the public administration needs.

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<sup>55</sup> OECD (2023). [Smart City Data Governance: Challenges and the way forward](#)

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

<sup>57</sup> GDC



### 3. *Relevant stakeholders are encouraged to work together to:*

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

## 2.2.2 Digital Public Infrastructure, Data and Smart City Services

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<sup>58</sup>. Strengthening **public oversight** over critical infrastructure and essential services is vital to protect privacy, cybersecurity and digital human rights, while local communities should be actively involved in the design, implementation, and monitoring of these infrastructures.

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 prioritize sustainability and resilience.

The integration of **advanced digital services** (e.g., smart mobility, energy grids, waste management, and public health systems) should focus on improving urban living conditions and ensuring widespread adoption across diverse socio-economic groups. Interoperable, scalable, and **technology-neutral** solutions are essential for effective delivery of services and long-term sustainability.

### **Principles**

**31. 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.**<sup>59</sup>

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<sup>58</sup> 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.

<sup>59</sup> Global Digital Compact



32. Smart city services are designed to be universally accessible, particularly for persons in vulnerable situations, while being adaptable to evolving urban needs.

33. 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.

34. Ensure that digital infrastructure and equipment are sustainably designed to address environmental challenges in the context of sustainable development.<sup>60</sup>

34. Digital platforms, digital twins and tools are used to enhance efficiency, inclusivity and transparency in advancing access to adequate housing, land and basic services.

## Actions

1. **National governments** in cooperation with other levels of government and relevant partners are encouraged to:
  - **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.
  - **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.
  - **Standardize interoperability and open data across digital systems at all governmental levels** to prevent silos, enable seamless service delivery, open-source solutions increase urban data availability.
  - **Define standards for local service provision of smart city tools and services**<sup>61</sup> based on the principle of subsidiarity and ensure the local level has the capacities and resources to exercise such provision<sup>62</sup>.
  - **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<sup>63</sup>.
  - **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.
  - **Create networks of data stewards across cities** for knowledge exchange and peer learning opportunities.

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<sup>60</sup>Global Digital Compact

<sup>61</sup> For example: <https://digitalprinciples.org/> or <https://www.undp.org/digital/standards>

<sup>62</sup> UN-Habitat, [International Guidelines on Decentralization and Access to Basic Services to All](#).

<sup>63</sup> UN-Habitat, [People-Centred Smart Cities Playbook Series: Building & Securing Digital Infrastructure](#)

2. **Local and regional governments** in cooperation with other levels of government and relevant partners are encouraged to:

- **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.
- **Develop transparent, safe and secure digital systems** and user-centred safeguards that can promote public trust and use of digital services
- **Ensure citizen engagement** in the design, implementation, and monitoring of smart city services to enhance their effectiveness.
- **Provide digital and data infrastructure** including by exploring public-private partnerships to increase capacities, while supporting community-led digital infrastructure initiatives
- **Advance digital public goods** including through open-source software, open data, open standards and open content to address the needs of people and communities
- **Invest in municipal internet networks** providing free public WiFi in city buildings and public spaces.
- **Standardize data protocols through the adoption of open standards** to enhance interoperability and data exchange.
- **Facilitate data sharing and collaboration** across municipalities, with other levels of governments and stakeholders to monitor smart city services and inform urban policy.
- **Establish protocols to protect residents' data privacy**, incorporate principles of privacy in a digital age aligned with community priorities.
- **Open urban data to communities**, empowering them to address challenges through projects like citizen science and crowdsourcing initiatives.

3. **Relevant stakeholders** are encouraged to work together to:

- **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
- **Conduct research and data collection** to design and pilot technologies and smart cities services that improve city planning, residents' participation and service optimization
- **Contribute to research user needs assessment** as well as on the use of emerging technologies and digital public infrastructure applications
- **Finance infrastructure projects** through investment funds, private bank loans, public-private partnerships or debt financing to the local government to increase investments.
- **Facilitate the design and supply of secure and trustworthy digital platforms**, applications and solutions that protect people's privacy.
- **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.
- **Establish open-access knowledge hubs and platforms** to disseminate inspiring practices and solutions, lessons learned, and scalable models.

- **Develop tools to make data accessible** to communities and support stakeholders in increasing tools uptake and use.
- **Collaborate with the public and private sectors** to co-design smart city services and support community groups willing to design their own services.
- **Support local communities in developing community owned digital infrastructure** and collecting and use community data for designing solutions based on local needs.

### 2.2.3 Digital Literacy and Skills Development

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 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. 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.

#### **Principles**

1. **Digital literacy efforts should ensure that everyone, regardless of background, has access to basic digital skills to fully participate in urban life.**
2. **Learning opportunities should be tailored to the diverse literacy needs, competency levels, local context and evolving technological landscapes to foster meaningful participation.**
3. **All stakeholders should have equal access to capacity-building opportunities, ensuring all individuals can engage in and benefit from smart city initiatives.**
4. **Collaborative partnerships and collaborations across sectors should be fostered to enhance digital capacity and create a supportive learning ecosystem.**
5. **Lifelong learning, intergenerational, interdisciplinary and continuous upskilling opportunities should be promoted to develop advanced digital skills.**

#### **Actions**

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.

1. **National governments** in cooperation with other levels of government and relevant partners are encouraged to:

- **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.
- **Adapt or develop competency frameworks for both public sector officials and residents**, to develop inclusive, trusted, secure and user-centred smart city services<sup>64</sup> and to ensure 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<sup>65</sup>.
- **Integrate digital skills training and curricula into education systems and public programs**, tailoring them to specific groups such public officials, women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations.
- **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.
- **Leverage online platforms, tools and resources** in diverse languages and accessible formats<sup>66</sup> for open, scalable and accessible learning programmes.

2. **Local and regional governments** in cooperation with other levels of government and relevant partners are encouraged to:

- **Offer 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.
- **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.
- **Facilitate participation in collaborative initiatives**, such as public-private partnerships, open-source communities, and local networks.
- **Conduct local needs assessments and evaluations** to tailor training programs, identify gaps, and monitor progress through key performance indicators and benchmarks.
- **Develop targeted local digital literacy programs** for specific groups such as elderly persons, caregivers, persons with disability, among others.
- **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).

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<sup>64</sup> Ibid.

<sup>65</sup> Ibid.

<sup>66</sup> Ibid.

### 3. *Relevant stakeholders are encouraged to work together to:*

- **Deliver digital training, mentorship and peer-learning opportunities and platforms that are tailored to learning needs and capacities of beneficiaries in communities.**
- **Establish metrics and processes to rigorously monitor the digital skills gaps and trends to identify capacity and skills needs, strengths and gaps** <sup>67</sup>.
- **Promote open access to digital educational services, tools and information.**
- **Facilitate dynamic and lifelong digital learning aimed at enhancing digital literacy and skills through local partnerships, including academic programs.**
- **Deliver educational programs, training and learning initiatives for the general public and public officials.**
- **Upskill employees and offering vocational training for workers affected by digitalization and automation.**

## 2.2.4 Budgeting and Financing

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 the design, implementation, and maintenance of digital infrastructure and services. 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.

### **Principles**

1. **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.**
2. **Smart city initiatives require comprehensive, long-term funding programs that support the design, delivery, and maintenance of digital infrastructure and services beyond fragmented, short-term funding schemes.**
3. **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.**
4. **Procurement frameworks should be modernized to adopt innovative sourcing practices that promote fair competition, interoperability and collaboration.**

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<sup>67</sup> UN-Habitat, [World Smart Cities Outlook 2024](#), p.38

5. ..

## Actions

1. **National governments** in cooperation with other levels of government and relevant partners are encouraged to:
  - **Develop national digital investment frameworks** that guide and incentivize sustainable smart city financing.
  - **Establish legal and financial structures** to support the development, financing and implementation of digital technology products and solutions.
  - **Establish regulations and policies** for public procurement of digital technologies, including standard clauses on accessibility and sustainability, and impact assessment, data protection due diligence throughout the lifecycle of technology use.
  - **Prioritize procurement of scalable open-source solutions and locally driven** innovation, supporting initiatives that stimulate local economic growth.
  - **Promote green procurement** by integrating environmental sustainability criteria into procurement processes, prioritizing digital products and services that are environmentally friendly and energy efficient.
  - **Explore alternative business models**, such as public-private partnerships (PPPs) and community-driven solutions to ensure the sustainable and equitable development of digital infrastructure and services.
  - **Allocate resources 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.
  
2. **Local and regional governments** in cooperation with other levels of government and relevant partners are encouraged to:
  - **Align municipal and regional budgets** with smart city priorities through long-term, data-driven financial planning and alignment with national investment frameworks.
  - **Align procurement practices** with national regulations, or establish local standards where necessary, to guide smart city technology procurement with social, ethical, and environmental criteria.
  - **Create financial frameworks** to support local community and civil society-led digital infrastructure projects through community-based financing, microfinance, and participatory budgeting.
  - **Develop diverse local financing models** that include multiple funding sources, revenue-generating contracts, cost-benefit analysis, and scalability strategies.
  - **Co-finance physical infrastructure** such as sensors and data centers, ensuring privacy and security are key conditions for investment agreements.



- **Run open innovation and innovation-based procurement** to involve micro-, small and medium-sized enterprises, start-ups, and community organizations in smart city projects.
- **Leverage procurement to foster innovation** by using methods like challenge-based innovation, performance-based contracting, design contests, and pre-commercial procurement.

3. **Relevant stakeholders** are encouraged to work together to:

- **Conduct research and innovation** to support sustainable digital infrastructure and service development, focusing on ethical, social, and environmental impacts.
- **Develop and promote evidence-based procurement policies** that integrate impact assessment and due diligence to ensure sustainability, accessibility, and protection of digital human rights.
- **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.
- **Support public-private partnerships** by co-financing projects, providing technological expertise, and ensuring compliance with privacy, security, and sustainability standards.
- **Explore alternative financing models**, such as performance-based contracts, green bonds, and revenue-sharing agreements, to promote long-term sustainability.
- **Invest in research, development, and prototyping** of environmentally sustainable technologies that align with smart city goals.

### 3. Implementation and Monitoring

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:

- (1) Baseline Assessments;
- (2) Capacity Building; and
- (3) Implementation and Monitoring.

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.



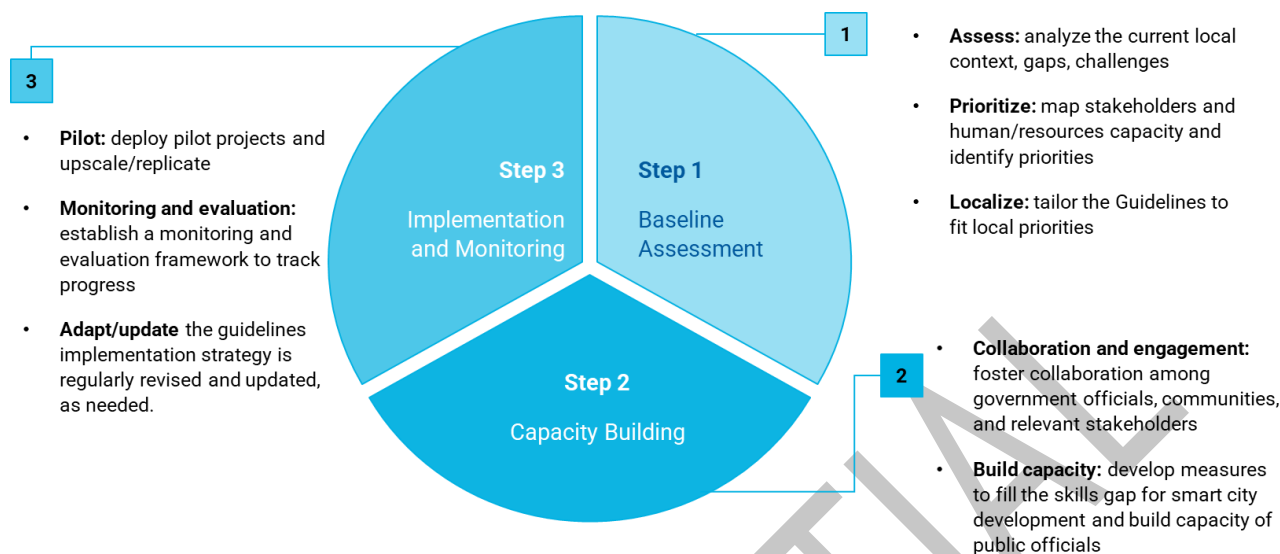


Figure 2 – Step by step approach to implement the guidelines

Table - Approach and actions to implement the Guidelines

| Step                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Objective                                                                                                                                                                                                                                                                                                                                                                       | Actions                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step1: Baseline Assessments</b>                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                          |
| Understand local contexts, map stakeholders and identify priority areas.                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Action 1.1: Assess:</b> <ul style="list-style-type: none"> <li>• Evaluate the current state of digital infrastructure, governance frameworks, urban planning and participatory practices.</li> <li>• Analyze local challenges such as gaps in technology, social inclusion, and sustainability efforts.</li> <li>• Map key stakeholders, including local authorities, civil society, private sector, and persons in vulnerable situations.</li> </ul> | <b>Action 1.2: Prioritize:</b> <ul style="list-style-type: none"> <li>• Use the baseline assessment to identify the key areas for improvement in smart city governance, technology integration, and gender inclusion.</li> <li>• Establish clear objectives based on the specific needs of each city, considering local social, environmental, and economic factors.</li> </ul> | <b>Action 1.3: Localize the Guidelines:</b> <ul style="list-style-type: none"> <li>• Adapt the Guidelines to align with local challenges and opportunities identified, ensuring flexibility to fit the unique needs of each city.</li> <li>• Customize key focus areas such as digital inclusion, urban resilience, and sustainable development to match the priorities of local communities.</li> </ul> |

## 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. innovation and collaboration across sectors.**
- **Focus on digital literacy programmes to empower vulnerable communities to participate in smart city initiatives and access digital services.**

### 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 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**

### Action 3.2: Monitoring and Evaluation (M&E):

- Set up a monitoring framework with Key Performance Indicators (KPIs) to track progress on inclusion, sustainability, and digital transformation.
- Conduct regular evaluations to measure the impact of Guidelines, allowing for course correction and refinement.

### Action 3.3 Adapt/update:

The guidelines implementation strategy regularly, as needed

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| <p><b>energy consumption, air quality, mobility, community participation, inclusion etc.</b></p> <ul style="list-style-type: none"> <li>• Develop frameworks aligned with the principles of the Guidelines to assess their effectiveness and scalability.</li> </ul> | <ul style="list-style-type: none"> <li>• Use data collected from the pilot projects and ongoing initiatives to guide future implementations and inform policy decisions.</li> <li>•</li> </ul> |
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Further, UN-Habitat, in collaboration with relevant stakeholders, aims to support the implementation of the guidelines globally through the following ways:

1. Facilitating diagnostics to evaluate cities and countries' readiness to adopt the principles of the guidelines.
2. Promoting people-centred smart cities impact assessments to review the societal, environmental, and economic impacts of digital technologies and related policies.
3. Enhancing knowledge, skill and capacities to mainstream, implement, and monitor the guidelines.
4. Partnerships to apply the principles and enablers of these guidelines also to promote scalability and replication of successful models.
5. Monitoring progress with the implementation of the principles through global data and review of practices including through the World Smart Cities Outlook.
6. Global advocacy and mobilization through networks of cities, countries, and partners committed to advancing the guidelines.

## ANNEX: Glossary

| TERM                                   | DEFINITION                                                                                                                                                                          |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Artificial Intelligence (AI)</b>    | Technology that enables machines and software to perform tasks typically requiring human intelligence, such as decision-making, language understanding, and data analysis.          |
| <b>Artificial intelligence systems</b> | Programmes or algorithms that analyze data to recognize patterns, make predictions, or automate decision-making.                                                                    |
| <b>Assistive technologies</b>          | 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. |
| <b>Automated decision-making</b>       | Decisions made by systems or algorithms with no human intervention.                                                                                                                 |
| <b>Big data</b>                        | Large and complex datasets characterized by high volume, velocity, variety, and variability, requiring advanced methods to process and analyze.                                     |
| <b>Cybersecurity</b>                   | Practices and measures to protect networks, data, and systems from unauthorized access and threats to confidentiality, integrity, and availability.                                 |
| <b>Community-based financing</b>       | Financial models driven by community involvement, such as participatory budgeting, where residents influence spending decisions.                                                    |
| <b>Data governance</b>                 | Policies and procedures to ensure data is collected, managed, and used ethically and securely, protecting privacy and ensuring accountability.                                      |

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| <b>Data platforms</b>         | Digital infrastructures used for data collection, storage, processing and sharing to support decision-making and the development of smart city tools and services                                                                                                                                                                                                                                      |
| <b>Data sharing agreement</b> | 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                                                                                                 |
| <b>Data stewards</b>          | Individuals designated to manage data governance activities within their department or organization                                                                                                                                                                                                                                                                                                    |
| <b>Data sovereignty</b>       | The idea that data is subject to the laws and governance structures that govern where it is collected.                                                                                                                                                                                                                                                                                                 |
| <b>Digital infrastructure</b> | Fundamental digital services such as broadband networks, data centers, and cloud services that support digital activities and services.                                                                                                                                                                                                                                                                |
| <b>Digital inclusion</b>      | Ensuring equitable access to digital technologies, services, and literacy, particularly for persons in vulnerable situations and underserved communities.                                                                                                                                                                                                                                              |
| <b>Digital identification</b> | 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                                                                                                                                                            |
| <b>Digital literacy</b>       | The ability to use information and communication technologies to find, evaluate, create and communicate information, requiring both cognitive and technical skills.                                                                                                                                                                                                                                    |
| <b>Digital public goods</b>   | Open-source resources, such as software, data, and models, that adhere to privacy and security standards and promote the Sustainable Development Goals (SDGs).                                                                                                                                                                                                                                         |
| <b>Digital services</b>       | 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                                                                                                                                                       |
| <b>Digital skills</b>         | A range of abilities to use digital devices, communication applications, and networks to access and manage information.                                                                                                                                                                                                                                                                                |
| <b>Digital twin</b>           | 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. |
| <b>Digital transformation</b> | 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 processes, and innovative technologies to improve efficiency, enhance user experiences, and drive sustainable development.                            |
| <b>Digitalization</b>         | Refers to the use of digital technologies to change an operating model and transform operational processes, providing additional revenue and value producing opportunities.                                                                                                                                                                                                                            |
| <b>E-waste</b>                | Discarded electronic equipment and devices.                                                                                                                                                                                                                                                                                                                                                            |
| <b>Interoperability</b>       | Refers to the ability of multiple technology systems to exchange information and to use the information that has been exchanged.                                                                                                                                                                                                                                                                       |

|                                       |                                                                                                                                                                                                                                                                                                                                                 |
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| <b>Metadata</b>                       | Provides a structured reference to the data collected that helps to sort and identify attributes of the information it describes                                                                                                                                                                                                                |
| <b>Media and information literacy</b> | 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                                                                                                                                  |
| <b>Open data</b>                      | 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.                                                                          |
| <b>Open data platforms</b>            | 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.                             |
| <b>Open standards</b>                 | 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.                                                                                                                  |
| <b>People-Centred Approach</b>        | 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.                                                                                                                                |
| <b>Smart Cities</b>                   | 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. |
| <b>Smart City tools</b>               | Software, applications and platforms developed by a smart city that leverages technology to address sustainable development challenges.                                                                                                                                                                                                         |
| <b>Vendor lock-in</b>                 | A situation in which a customer using a product or service cannot easily transition to a competitor's product or service                                                                                                                                                                                                                        |