



Draft International Guidelines on People-Centred Smart Cities

Draft for Consultation

“Leveraging innovation to guide the development of open, inclusive, sustainable and resilient cities and communities”

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1. Introduction

Digital technologies are transforming all aspects of urban life everywhere. Through digital tools, profound advancements are being made in enhanced urban public service delivery, planning, and community engagement, among others. Urban residents globally are benefiting from increased access, affordability and efficiency of digital services. Notwithstanding, as cities benefit from digital transformation, it is crucial to ensure that these advancements are fully aligned with and respond to the needs of people and the planet.

Digital technology is reshaping people's lives in cities across political, economic and social spheres¹. The potential risks are considerable. If appropriate measures are not in place to regulate the deployment and impact of digital technologies, inequalities within and amongst countries, discrimination², surveillance, bias, disinformation, social and political polarization, segmentation and exclusion may arise. These risks can be exacerbated where different forms of discrimination and marginalization coexist and overlap with digital gaps in terms of gender, age and education. Pre-existing social and territorial divides may also hinder urban residents from equitably accessing and benefiting from digital services.

Cities and Local and Regional Governments face the challenge of balancing the positive outcomes of digital transformation for sustainable urban development and community empowerment while addressing negative impacts on people. Strategies, policies and regulations that govern digital technologies and spaces are critical to ensure they advance sustainability and quality of life³ in urban areas so that no one and no place is left behind. The people-centred smart city approach recognizes that digital technology needs to be a tool for promoting safe, inclusive, resilient and sustainable cities and communities⁴, not the ultimate goal. The primary purpose of digital technologies for urban development is to improve the quality of life of residents inclusively promoting equitable access to digital tools and urban services. The "smartness" of a city should be understood according to how well digital solutions directly serve and respond to the needs of people and the environment⁵.

This approach also recognizes that technologies are not neutral, as in some cases, without the proper regulatory framework, their use may result in infringement of people's fundamental rights. By shifting from the traditional smart city primary focus on technology, people-centred smart cities focus on building trust with local communities, increasing the participation of people in shaping territories and resources that are human-rights based and gender

¹ UNITAC Post Conference Report. Consultation on the International Guidelines on People-Centred Smart Cities: https://drive.google.com/file/d/1zHs9vKLnNIE344Ogkd_I4k-NTMfRYrgb/view

² <https://unsdg.un.org/2030-agenda/universal-values/leave-no-one-behind>

³ <https://unhabitat.org/quality-of-life-initiative>

⁴ SDG 11: Sustainable Cities and Communities: <https://www.globalgoals.org/goals/11-sustainable-cities-and-communities/>

⁵ UN-Habitat People Centred Smart Cities Playbook: Centering People in Smart Cities. Url: <https://unhabitat.org/programme/legacy/people-centered-smart-cities/centering-people-in-smart-cities>

responsive, and promoting urban spaces that enhance agency, creativity, collaboration, social cohesion and innovation.

The International Guidelines on People-Centred Smart Cities aim to provide a novel normative foundation and global approach for state and non-state actors to ensure urban digital transformation and governance focus on people first. Through the Guidelines, the aim is to shift from a technology-driven approach to a people-centered model of smart city development based on community engagement and participation. The primary aim is to promote cities and human settlements that are safe, inclusive, resilient, sustainable, prosperous and human rights-based aligned to the goals of the New Urban Agenda and the Sustainable Development Goals.

The Guidelines provide structured guidance on how to balance the political, economic, environmental and societal outcomes of technologies. They are not a blueprint, but a set of recommendations to help seize the advantages technology can bring if used, structured, governed and managed responsibly. The Guidelines serve as a reference point for Member States and Local and Regional Governments willing to mainstream digital transformation in sustainable urban development as they face the complexity of managing political, administrative and social tensions in a context of increasing digital divides, inequalities and environmental challenges. The Guidelines are intended to bridge global visions for digital transformation and local implementation across a wide range of readiness levels and diverse local ecosystems.

1.1 Objectives of the Guidelines

Following the Resolution [HSP/HA.2/Res.1](#) adopted by the United Nations Habitat Assembly on 9 June 2023, UN-Habitat has been mandated 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 to ensure that digital urban infrastructure and data contribute to making cities and communities that are sustainable, inclusive, prosperous, gender-responsive and human rights-based.

The main objectives of the Guidelines are:

- **Develop a global normative framework:** Establish a normative foundation based on agreed principles to support Member States and relevant partners in promoting people-centred smart cities. The Guidelines serve as a global framework by defining and establishing minimum standards that must be in place and are common to all smart cities willing to become people-centred and assess existing risks and the wider beneficial impacts of technologies and data in urban development to leave no one behind. As a driver for policy reform and governance processes, the Guidelines should be adapted to local contexts to align with existing regulations, capacities and needs.
- **Advocate for People-Centred Smart Cities:** Elevate and legitimize the concept of putting people at the center of smart city initiatives to ensure that urban digital transformation prioritizes community needs and human rights over purely technology-led approaches. The Guidelines bring the concept and notion of people-centred approaches to the mainstream of smart city development. They promote community-

focused urban development practices that foster trust, protect and promote fundamental rights, and create a collaborative ecosystem that enhances the quality of life of present and future generations, increasing inclusion, sustainability and innovation.

- **Provide structured practical guidance:** Provide recommendations to cities and Local and Regional Governments on how to drive investments and financing to embark in the process of becoming “people-centred” based on specific needs and readiness levels. This is intended to accelerate the achievement of the Sustainable Development Goals (SDGs) globally. The Guidelines are to serve as an actionable resource for a range of governmental and non-governmental stakeholders⁶ including policymakers at the national, regional and local levels, urban planners, technology providers, civil society organizations, academia, research institutions and professional bodies and community leaders. They aim to inform the design and application of smart city policies, strategies, visions, investments and institutional arrangements by Local and Regional Governments to maximize impact on people’s quality of life.
- **Enable global cooperation for smart city development:** Connect global visions with local implementation, ensuring that international principles, such as those of The Pact of the Future and its Annex the Global Digital Compact⁷, are effectively adapted and applied in diverse local contexts. The Guidelines are a normative instrument to foster collaboration and partnerships between international organizations, development agencies, and donors to connect resources, expertise and funding for smart city projects prioritizing people's needs and well-being. The Guidelines may also enhance local knowledge-sharing networks and platforms, further strengthening international support for people-centred smart cities.

The Guidelines contribute to and are informed by ongoing UN-wide regulations, initiatives and processes such as the Secretary General’s Roadmap for Digital Cooperation⁸ including the Pact of the Future, the Global Digital Compact and the High-level Advisory Body on Artificial Intelligence (AI)⁹, the Digital Public Infrastructure (DPI) safeguards¹⁰, and innovative approaches such as Media and Information Literacy Cities¹¹ promoted by UNESCO and the United for Smart Sustainable Cities¹² (U4SSC) initiative among others and will advocate for

⁶ For purposes of these Guidelines, a stakeholder refers to any individual, group, or entity – governmental, non-governmental, multilateral entity, civil society, private sector, or community – that will play a role in, benefit from, or is impacted by, the outcomes and activities of the guidelines.

⁷ General Assembly A/79/L.2- The Pact of The Future- Annex I: Global Digital Compact. Url: https://www.un.org/global-digital-compact/sites/default/files/2024-09/Global%20Digital%20Compact%20-%20English_0.pdf

⁸ United Nations Secretary General’s Roadmap for Digital Cooperation. Url: <https://www.un.org/en/content/digital-cooperation-roadmap/>

⁹ <https://www.un.org/en/ai-advisory-body>

¹⁰ <https://www.dpi-safeguards.org/>

¹¹ <https://www.unesco.org/en/media-information-literacy>

¹² <https://u4ssc.itu.int/>

the role cities have in achieving this vision and ensure an open, free and secure digital future for all.

1.2 Definition of people-centred smart cities

Reflections on the link between cities and technology emerged in literature as early as the 1980s. The concept “smart city” emerged in literature in early 2000, gaining significant traction by 2010 as large technology companies steered its definition and application. Initially, the concept examined the city’s ability to integrate information and communication technologies (ICT) with the efforts to organize, design and plan the city. The narrative surrounding smart cities emphasized efficiency, optimization and the utilization of Big Data and computational solutions. Consequently, cities became experimental grounds for untested or poorly regulated technologies in some contexts, with potentially harmful outcomes and risks for people such as diminished trust, invasion of privacy, cybersecurity threats, and racial and gender discrimination¹³.

Recently, CSOs, academia, local government officials, community groups, and International Organizations have advocated for a just and equitable approach to smart city development. UN-Habitat and partners have been at the forefront of mainstreaming an inclusive, sustainable, and human rights-based approach to smart city development. The International Guidelines respond to the request by Member States to provide an international normative framework for promoting a people-centred smart city approach.

For the purpose of the Guidelines, People-Centred Smart Cities are defined as follows: *“A people-centred smart city leverages technology to improve the quality of life of people and the sustainability and resilience of the environment, while advancing shared prosperity and inclusion. It ensures that smart city innovations are developed through participatory approaches and collaboration, providing equitable access to digital services, skills and infrastructures especially for people in vulnerable situations. It respects, protects and promotes human rights, with multi-level governance systems and regulations ensuring that technology supports sustainable development rather than becoming the goal itself”*.

The definition reflects the need to connect digital tools with human needs, contextualized and tailored to reflect local realities and priorities. A people-centred smart city approach advocates for shifting from a “technology-driven” to “people-driven” development and deployment of digital solutions. It recognizes that technologies and digital tools by themselves do not make cities “smart”. Rather, it is the participation and collaboration of people and local communities that shape their design and effective uptake. Therefore, people-centred smart cities promote participatory and inclusive environments as a matter of priority.

To build trust with local communities and support them in defining their own vision of “smart” through community participation and collaboration, people-centred smart cities engage with a diverse range of local stakeholders including Civil Society Organizations (CSOs), academia, and the private sector to deliver inclusive and accessible innovations to respond to community needs. Under this approach, being “smart” implies building “for” and “with” people and their

¹³ UN-Habitat People-Centred Smart Cities Playbook Series-Centering People in Smart Cities

collaborative ecosystem, ensuring everyone can flourish and equitably access connectivity, devices and skills, with technology serving as a tool to help reduce territorial and social inequalities. Balancing the use of digital technology with culture and community values is also key.

The people-centred smart city approach considers technology as a tool to empower local communities but recognizes need for robust legal frameworks to ensure the technology serves and is not used to surveil or control people against international human rights obligations. Governments are at the forefront of this tension, bearing much of the responsibility to make sure everyone has the capacity and means to participate in a digital society. They are expected to make services accessible and inclusive to all by promoting meaningful participation offline and online while assessing the differential impact of technology on human rights. To balance the opportunities and challenges posed by technology, a people-centred smart cities approach advocates for multi-level and multi-sector governance, robust digital governance frameworks, secure and resilient digital infrastructure, and transparent decision-making processes.

The public sector's role in a people-centred smart city goes beyond regulation and includes ensuring that technology application is aligned with principles of sustainable urban development defined in the New Urban Agenda and the Sustainable Development Goal 11 (Make cities inclusive, safe, resilient and sustainable). Alignment with national development priorities and planning is also critical. Using technology as an enabler, people-centred smart cities must prioritize solutions that address the most pressing urban development challenges for the benefit of both present and future generations. This applies to cities of all scales and sizes, including cities and urban settlements, metropolitan and regional levels.

1.3 Preparatory process for the development of the Guidelines

To respond to the Member States' request to ensure that the guidelines are developed through an inclusive consultative process, UN-Habitat defined the following governance arrangements and consultative process:

- An **Expert Working Group**¹⁴ has been appointed as the primary advisory body for developing the Guidelines. This group consists of 31 experts, representing 25 countries, nominated by Member States who play a leading role in advising the Executive Director of UN-Habitat. This diverse panel ensures a globally inclusive consultation process, leveraging insights from leading global experts in smart city development, digital transformation and sustainable urbanization. In alignment to the Member States' directive for a consultative approach, UN-Habitat hosted regular meetings with experts to provide continuous advisory support to the Guidelines.
- **Regional consultations** are convened to ensure input for the International Guidelines based on regional challenges and opportunities. A series of these consultations will

¹⁴ The full list of experts can be found in this link: <https://unhabitat.org/expert-working-group-for-the-development-of-the-international-guidelines-on-people-centred-smart>

be held in 2024 and 2025 to facilitate relevant interactions and exchanges among key regional stakeholders and UN-Habitat's partners.

- **Stakeholder consultations** are convened with a wide range of organizations and partners from civil society organizations, academia, local and regional governments, UN-Habitat advisory groups, UN Agencies, Multilateral Organizations, and the private sector to ensure adequate and inclusive inputs.
- **Online consultation** is opened globally to offer an opportunity to relevant stakeholders to contribute views, inputs, and ideas to enhance the Guidelines.

UN-Habitat developed the Guidelines based on lessons learned, normative work and ongoing projects under its People-Centred Smart Cities Flagship Programme, as well as experiences and knowledge of UN-Habitat's partners and stakeholders. In addition, UN-Habitat commissioned a global assessment on smart cities – the **World Smart Cities Outlook** – to serve as a factual bedrock for the Guidelines grounded on solid empirical evidence and global knowledge.

2. International Guidelines on People-Centred Smart Cities

The International Guidelines on People-Centred Smart Cities provide an integrated framework to promote sustainable urban development globally based on universally agreed principles to develop solutions that address people's needs and leverage data, technology, and innovation for common good.

2.1 Structure of the Guidelines

The Guidelines are divided into seven **thematic areas** that help operationalize the core values of the people-centred smart city approach. These thematic areas intersect and complement each other and should be considered holistically, as they constitute interconnected elements and enablers to embed the people-centred smart city approach in strategies, policies, and initiatives based on local priorities and community needs.

Each thematic area includes a set of **principles** that consist of the core values underpinning the people-centred smart cities approach and the **duties** that stakeholders should put in place to uphold them (refer to Figure 1). The principles are based on local realities and acknowledge the diversity in readiness levels of cities, institutional and governance arrangements, and objectives for smart city development. Duties aim to provide normative and practical recommendations across the collaborative ecosystem of a people-centred smart city for the following actors:

- **Local and Regional Governments:** includes elected officials, agencies, quasi-government and government-owned organizations at the local and regional levels, civil

servants delivering infrastructure and urban services, creating laws and regulations and those in charge of developing and implementing urban policies¹⁵.

- **National Governments:** Ministries and departments, elected officials, public servants, public institutions, public enterprises and regulatory and oversight bodies at the national level.
- **Civil Society Organizations:** includes nonprofits, non-governmental organizations (NGOs), grassroots organizations, cooperatives, foundations, associations, human rights organizations, working groups, charities and advocacy organizations.
- **Academia, research institutions, and professional bodies:** includes universities, professional bodies (architects, urban planners, engineers, among others), research centers and Think Tanks.
- **Private Sector:** includes industries at all levels and utility companies; technology companies (telecommunication companies, technology providers, start-ups, developers, social media platforms, local businesses, small and medium size enterprises); and financial sector (banks and other financial institutions).

Depending on the context, institutional arrangements, local capacities and community needs, state actors willing to implement the approach can build their own vision and priorities of a smart city that is people-centred based on the thematic areas, principles and duties contained in these Guidelines.

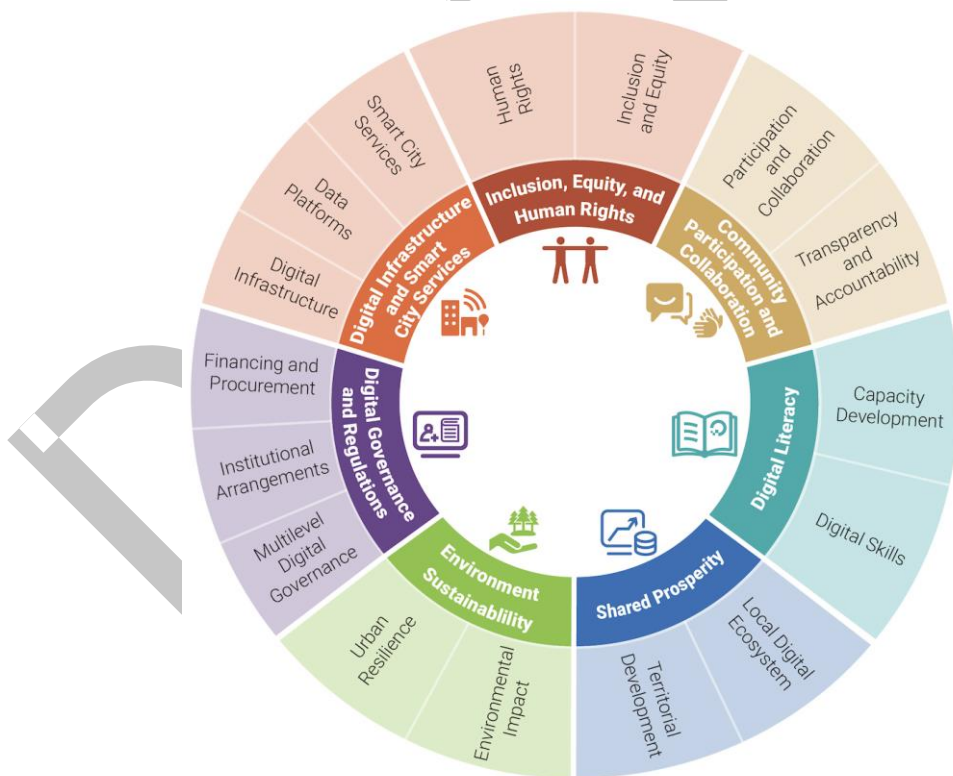


Figure 1 - Structure of the International Guidelines on People-Centred Smart Cities

¹⁵ Please note that roles for Local and Regional Governments can differ across countries, considering the subsidiarity principle and depending on governance arrangements and organizational structures.

2.2 Principles and Duties

Core values and actions to uphold the International Guidelines

The International Guidelines principles and values are 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, and support to achieve the Sustainable Development Goals and the New Urban Agenda.

2.2.1 Inclusion, Equity and Human Rights

Human rights protection and promotion, equitable and affordable access, representation and inclusion are essential preconditions to benefit from smart city innovations. Actions to uphold equity and inclusion in smart city development include working towards universal and meaningful connectivity and affordable access, equitable deployment of infrastructure, enhancing ownership and accessibility challenges and protecting people from potential risks posed by technologies such as bias, profiling and unlawful surveillance.

Human Rights

People-centred smart cities respect, protect and promote human rights including civil, political, economic, social, and cultural rights and fundamental freedoms, to create an inclusive, open, safe and secure digital space¹⁶. All stakeholders must provide redress mechanisms to prevent discrimination and exclusion of people in vulnerable situations and other potential harmful impacts, identifying and mitigating risks and ensuring human oversight of technology¹⁷.

National Governments in collaboration with other governmental levels should develop and enact accountability frameworks, legislation, safeguards, and redress mechanisms to respect, protect and promote human rights and fundamental freedoms in line with international human rights law including through:

- Measures to respect and protect the right to privacy¹⁸ and embed human rights principles in regulations, policies and processes, including the Guiding Principles on Business and Human Rights¹⁹. The aim is to safeguard individuals against violations and abuses in digital spaces and mitigating potential harmful impacts and consequences arising from the use of emerging technologies.
- Mechanisms to report and remedy human rights violations in the digital space such as cybercrime, online abuse, discrimination based on sexual orientation and gender

¹⁶ General Assembly A/79/L.2- The Pact Of The Future- Annex I: Global Digital Compact: https://www.un.org/global-digital-compact/sites/default/files/2024-09/Global%20Digital%20Compact%20-%20English_0.pdf

¹⁷ Ibid.

¹⁸ Resolution A/HRC/51/17: The right to privacy in the digital age

¹⁹ OHCHR- Guiding Principles on Business and Human Rights. Url: https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf

identity²⁰ and gender-based violence, and safeguard privacy, human dignity, security, equal treatment and personal integrity.

- Standards, regulations and guidelines to counter hate speech and discrimination, disinformation, misinformation and unlawful surveillance from digital platforms, promote content moderation and accountability²¹ and protect women, girls and children from online threats, ensuring a safe and inclusive digital space²².

Local and Regional Governments should embed human rights principles and mechanisms in regulations, policies and processes based on national and international human rights law to govern the design and deployment of technology in the urban realm by:

- Focusing on the context of use and diversity of people that will potentially access them and ensuring that solutions are gender-responsive, accessible for persons with disabilities, older persons, migrants, refugees and internally displaced persons, Indigenous Peoples and those in vulnerable situations and protect the rights of the child in the digital space²³.
- Developing and deploying transparent, unbiased artificial intelligence algorithms to ensure fairness, accountability and trust in decision-making processes.

All stakeholders must comply with and respect international human rights law and principles²⁴ and conduct risk assessments to identify actual or potential human rights impacts²⁵ by:

- Conducting human rights due diligence, impact assessments and algorithm risk management approaches to evaluate adverse risks²⁶ and discriminations from smart city tools and ensure the proportional use of emerging technologies throughout their lifecycle.
- Ensure that laws and regulations on the use of technology in areas such as surveillance and encryption are in line with international law²⁷.

²⁰ Resolution A/HRC/RES/32/2: Protection against violence and discrimination based on sexual orientation and gender identity.

²¹ UNESCO Guidelines for the Governance of Digital Platforms. <https://www.unesco.org/en/internet-trust/guidelines> and Global Digital Compact

²² General Assembly A/79/L.2- The Pact Of The Future- Annex I: Global Digital Compact: https://www.un.org/global-digital-compact/sites/default/files/2024-09/Global%20Digital%20Compact%20-%20English_0.pdf

²³ General Assembly resolution 44/25: Convention on the Rights of the Child; and Global Digital Compact

²⁴ General Assembly A/79/L.2- The Pact Of The Future- Annex I: Global Digital Compact: https://www.un.org/global-digital-compact/sites/default/files/2024-09/Global%20Digital%20Compact%20-%20English_0.pdf

²⁵ OHCHR Guiding Principles for Business and Human Rights. Url: https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf

²⁶ 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.

²⁷ General Assembly A/79/L.2- The Pact Of The Future- Annex I: Global Digital Compact: https://www.un.org/global-digital-compact/sites/default/files/2024-09/Global%20Digital%20Compact%20-%20English_0.pdf

- Developing transparency measures, enacting informed consent practices, impact assessments and safeguards to protect personal data throughout the data lifecycle of collection, sharing and use. This shall include the right to erase personal information and minimize data collection.
- Implementing procedures to uphold the right of people to access diverse, clear, transparent and reliable information related to urban processes, smart city tools and technologies to make informed decisions, be involved in participatory processes, and exercise fundamental rights.

Civil Society Organizations should support the enforcement and oversight of human rights laws and regulations by:

- Monitoring the impact of regulations and emerging technologies on human rights and reporting potential human rights law violations.

Academia, research institutions, and professional bodies, in collaboration with other stakeholders, should assess and evaluate the impact of technology on human rights by:

- Developing frameworks and conducting research on the implications of technology and potential risks.

Private Sector, including companies, developers and digital infrastructure providers should respect, promote and protect human rights throughout the technology lifecycle, being accountable for and taking measures to mitigate and prevent potential risks to ensure technologies and smart city tools uphold human rights and do not perpetuate bias or discrimination by:

- Providing access to effective remedy²⁸, conducting human rights due diligence and impact assessments.
- Implementing robust controls and content moderation systems to effectively identify and remove harmful content, such as hate speech, to ensure a safer and more respectful digital environment²⁹.
- Developing strategies to empower users and promote an open and safe online environment that safeguards human rights through media and information literacy, including online safety-related training material and safeguards³⁰ and cybersecurity measures to protect individuals from online threats and attacks.
- Sharing insights deriving from smart city tools, data and algorithms implemented in the public realm through publicly accessible portals.

²⁸ OHCHR Guiding Principles for Business and Human Rights. Url: https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf

²⁹ UNESCO Guidelines for the Governance of Digital Platforms. Url: <https://www.unesco.org/en/internet-trust/guidelines>

³⁰Ibid.

Equity and Inclusion

Digital tools and services must be inclusive and accessible to all, including people in vulnerable situations, with a focus on people living in extreme poverty, migrants, refugees, indigenous people, ethnic minorities, people with disabilities, elderly, youth and women³¹.

Digital tools should address the needs of people based on individual circumstances such as affordability and ownership gaps, digital and educational literacies, gender, disability, age, geographic conditions or other intersectional factors for exclusion, with the purpose of increasing agency and knowledge and helping local communities benefit from smart city tools and services to leave no one behind³².

Local and Regional Governments, in collaboration with National Governments and other relevant stakeholders, must reduce barriers to access the internet and smart city services, ensure the adequacy of digital infrastructure and develop partnerships and engagements to co-design tools that represent the needs of people in vulnerable situations, in particular:

- Developing a digital inclusion plan in collaboration with all stakeholders to address gaps such as connectivity, digital literacy and accessibility. Community advisory mechanisms may also be created to convene stakeholders to inform plans and programs³³.
- Assessing the digital divide by implementing surveys, analyzing data from digital inclusion surveys and other sources and identifying gaps in terms of gender, age, location and other factors.
- Providing digital infrastructure in low-income areas through service provision regulation, incentives, subsidies, or public operation. Invest in free Wi-Fi access points in public spaces such as libraries and community centers.
- Providing access to affordable devices and equipment (e.g. refurbished computers, tablets, smartphones, printers) via lending programs, subsidies and discounts.
- Engaging with persons with disabilities and other vulnerable groups to identify and remove barriers to accessibility by:³⁴
 - o Using universal web accessibility standards, accessibility design principles for people with disabilities, language diversity, and integration of assistive technologies into all smart city tools, services, platforms, and information.

³¹ <https://www.un.org/en/fight-racism/vulnerable-groups>

³² UNSCEB-Leaving no one behind: Equality and non-discrimination at the heart of sustainable development. Url: https://unsceb.org/sites/default/files/imported_files/CEB%20equality%20framework-A4-web-rev3.pdf

³³ UN-Habitat People-Centred Smart Cities playbook series: Addressing the Digital Divide. url: https://unhabitat.org/sites/default/files/2021/11/addressing_the_digital_divide.pdf and UNDP- Digital Inclusion Playbook 2.0 (2024) url: <https://www.undp.org/policy-centre/singapore/publications/digital-inclusion-playbook-20>

³⁴ Art. 9 of the Convention on the Rights of Persons with Disabilities: <https://social.desa.un.org/issues/disability/crpd/article-9-accessibility#collapse-disability>

- Providing assistive measures and technologies in public spaces and participatory platforms to ensure inclusion and participation.
- Addressing digital, language and literacy barriers to ensure access to online information in preferred format and languages.

National Governments, in collaboration with other governmental levels and other relevant stakeholders, should ensure that internet services, digital devices and smart city tools and services are available, accessible and affordable for everyone, particularly in low-income and remote areas, by:

- Designing policies, oversight bodies and monitoring systems to promote digital inclusion in projects and plans.
- Implementing digital inclusion surveys to assess and address the digital divide, including data disaggregated by income, sex, age, race, ethnicity, migration status, disability and geographical location and other characteristics relevant in national contexts³⁵.
- Promoting universal internet coverage by exploring measures such as subsidies, vouchers or other incentives, including the development of community networks and last-mile connectivity.
- Promoting universal, meaningful and affordable connectivity³⁶ including through targets, indicators and metrics in national development plans.
- Following international, regional and local standards on universal accessibility and inclusive design and raising awareness among stakeholders to apply those standards.

Civil Society Organizations should engage with Local and Regional Governments and technology developers to represent the needs and challenges faced by vulnerable groups by:

- Facilitating partnerships with local organizations and businesses to implement digital inclusion programs for vulnerable populations (e.g. low cost or no cost access to devices, digital literacy courses, after school programs, etc.).
- Monitoring the implementation of smart city tools to ensure they are accessible, affordable and usable.
- Advocating for the inclusion of vulnerable groups in the design and deployment of digital technologies.

Academia, research institutions and professional bodies, in collaboration with the public sector and other relevant stakeholders should provide expertise to study the digital divide by:

- Collecting and analyzing data, implementing surveys and performing scientific analysis and policy recommendations.

Private sector, including technology companies, developers, small and medium enterprises (SMEs) and local businesses should strive to develop affordable and accessible digital services, tools and platforms by:

³⁵ General Assembly A/79/L.2- The Pact Of The Future- Annex I: Global Digital Compact: https://www.un.org/global-digital-compact/sites/default/files/2024-09/Global%20Digital%20Compact%20-%20English_0.pdf

³⁶ <https://www.itu.int/itu-d/sites/projectumc/home/aboutumc/>

- Designing gender and disability-aware, user-centric services in compliance with universal design and accessibility standards.
- Assessing needs and blockers that vulnerable groups may face when finding, accessing and using a service, and including this input in the design of solutions.

Table 1- Basic conditions and recommendations on Inclusion, Equity and Human Rights

Thematic Area: Inclusion, Equity and Human Rights		
Principle	Human Rights	Equity
Objective	Respect, protect and promote human rights, identify and mitigate potential risks from technology	Ensure that tools and services are inclusive and accessible to all, including vulnerable groups
Immediate Actions		
Local and Regional Governments	<ul style="list-style-type: none"> • Embed human rights principles in local legislation • Develop mechanisms to protect privacy 	<ul style="list-style-type: none"> • Assess and address the digital divide • Provide access to affordable devices, equipment and digital infrastructure • Ensure accessibility of smart city services
National Governments	<ul style="list-style-type: none"> • Develop accountability frameworks, legislation and safeguards 	<ul style="list-style-type: none"> • Ensure availability and affordability of internet services, digital devices, services and platforms • Develop digital inclusion policies
Civil Society Organizations	<ul style="list-style-type: none"> • Enforce, oversight and monitor the impact of regulations • Report human rights violations 	<ul style="list-style-type: none"> • Implement digital inclusion projects • Represent the needs of vulnerable populations • Monitor implementation of smart city tools
Academia, research institutions and professional bodies	<ul style="list-style-type: none"> • Assess and evaluate impact of technology on human rights 	<ul style="list-style-type: none"> • Collect and analyze data on the digital divide • Provide policy recommendations
Private Sector	<ul style="list-style-type: none"> • Ensure privacy and security in smart city tools and digital platforms 	<ul style="list-style-type: none"> • Develop affordable and accessible digital services, tools and platforms. • Apply universal design and accessibility standards
All sectors	<ul style="list-style-type: none"> • Conduct human rights due diligence and impact assessments 	

2.2.2 Community Participation and Collaboration

To ensure inclusive and sustainable smart city solutions that meet peoples' needs, community participation and collaboration is vital. People-centred smart cities strive to increase trust amongst stakeholders, give voice to local communities in decisions that impact their lives and promote participatory opportunities to design tools that include diverse perspectives and increase agency. They also need to forge trustworthy engagements and collaborations with stakeholders, fostering transparency and accountability by communicating the goals, processes and outcomes of smart city projects.

Participation and Collaboration

People and communities should have an opportunity to be involved in identifying issues and defining strategic goals in the planning and design of smart city tools and services. Therefore, people-centred smart cities should ensure people have the skills, tools and resources to give their input and feedback, co-create specific smart city interventions and influence decision-making processes. They should also support collaboration of all stakeholders to encourage meaningful participation of people and local communities.

Local and Regional Governments should promote collaboration with other relevant stakeholders and engage with people meaningfully and responsibly during the design, implementation and evaluation of smart city projects by:

- Assessing and addressing literacy, accessibility, informational and language gaps that may hinder participation.
- Appointing a diverse advisory council with key local organizations and community representatives to increase collaboration and community engagement.
- Appointing public officials as focal points to connect with community-based organizations, community leaders, neighborhood representatives and CSOs for greater communication and increased community trust. This may include providing support and resources to organizations to strengthen collaboration.
- Designing participatory platforms and tools to help enhance feedback, enable people to voice concerns, suggest ideas, proactively detect and diagnose needs and support the co-design of smart city tools and services. Design user-friendly interfaces, multilingual support, accessibility features, explore use of immersive technologies and offer in-person alternatives such as interviews, surveys, community meetings, planning exercises to ensure inclusion and broader participation of vulnerable groups.
- Developing guidelines, resources, feedback mechanisms and communication channels to assess needs including guidance on how to mitigate potential risks such as discrimination, disinformation and polarization.
- Promoting participatory approaches to ensure that the strategic agenda of smart cities is reflective and inclusive of the perspectives and needs of multiple stakeholders such as:
 - o Local assemblies, community durbars, townhall meetings and other in-person opportunities for public participation and awareness on smart city projects.

- Participatory budgeting and planning projects, leveraging inclusive and bottom-up processes.
- Participatory governance models that involve diverse stakeholders in structural and meaningful co-creation of solutions.
- Promoting the development of collaborative spaces such as FabLabs, hubs, and urban innovation labs to support the co-design of smart city tools and services and engage with local communities.

National Governments should foster inclusive and meaningful engagement at the local level by:

- Implementing policies and developing participatory frameworks to increase community participation.
- Offering national digital platforms and applications to enable participation.
- Developing guidelines to enhance public participation and provide recommendations to increase transparency, security and inclusion.
- Promoting research and development, including establishment of innovation hubs.

Civil Society Organizations, in collaboration with other stakeholders, should support the active participation of people in vulnerable situations and local communities and represent their interests and needs in the development of smart city tools and services by:

- Participating in the preparation, implementation and monitoring of consultation processes in smart city projects, supporting local authorities in assessing needs.
- Being actively engaged during consultations and join public sector steering committees and advisory groups.
- Assessing the needs of vulnerable and unrepresented groups and helping them advocate for greater participation.

Academia, research institutions, and professional bodies should also be involved in and facilitate participatory process by:

- Joining public sector steering committees and participate in advisory groups for smart city development.
- Producing research on participatory methods and community engagement practices.

Private sector, including technology companies, developers and SMEs should:

- Support the development of tools and platforms that enhance participation in the design and application of technology.
- Conduct user-experience research to ensure that platforms work for diverse groups of users and are evaluated for their impact and uptake in the local community.
- Contribute to public trust in and adoption of emerging technologies through community participation and public-private partnerships.

Transparency and Accountability

People-centred smart cities promote transparency and accountability by maintaining open and accurate communications with stakeholders about the progress of smart city projects, enhancing trust, and embracing a data driven and needs-based approach to responsive policymaking.

Local and Regional Governments should be transparent on the status and processes of smart city interventions by:

- Setting guiding principles, expected outcomes and commitments for the development of smart city projects through a participatory process and consultation, providing regular updates and reporting yearly on the progress.
- Leveraging digital technologies to communicate policy decisions in an active and transparent manner (e.g. through council information systems or publishing public budget data in open formats).
- Using metrics and feedback from the public to evaluate the usefulness, efficiency and impact of tools and interventions.
- Publishing in open and accessible formats policy documents, public budgets, annual reports, and information about pilots and impact assessments on the use of emerging technologies (AI, sensors and vendor registries).

National Governments, in collaboration with other governmental levels, should develop frameworks to encourage collaborations in smart city projects such as:

- Legal frameworks for partnership agreements, memorandums of understanding (MOUs) and data sharing agreements.
- Guidelines and provisions to increase transparency in the development of smart city tools and services such as providing access to codes, reporting algorithms being used by the public administration and implementing auditing processes.

Civil Society Organizations, in collaboration with local communities and other stakeholders, should monitor the progress of outcomes and smart city commitments by:

- Holding the public sector accountable for the actions and progress of smart city plans.
- Monitor the inclusion of feedback from local communities in smart city plans and programs.

Academia, research institutions, and professional bodies, in collaboration with other stakeholders, should measure the impact of smart city interventions by:

- Monitoring smart city commitments and projects.
- Developing research methods, impact evaluations and indicators on smart city development.

Private Sector entities should ensure that smart city commitments are embed in the development of smart city tools by:

- Developing tools to increase transparency and access to information.
- Facilitate transparency measures when engaging in a public-private partnership.

Table 2- Basic conditions and recommendations on Community Participation and Collaboration

Thematic Area: Community Participation and Collaboration		
Principle	Participation and Collaboration	Transparency and Accountability

Objective	Support collaboration of all stakeholders and encourage meaningful participation of people and local communities	Increase transparency and accountability on the progress of smart city projects and initiatives
Immediate Actions		
Local and Regional Governments	<ul style="list-style-type: none"> • Develop tools and guidelines to engage with people meaningfully and responsibly • Connect with community leaders 	<ul style="list-style-type: none"> • Co-create and publish smart city commitments • Report on the status of smart city projects
National Governments	<ul style="list-style-type: none"> • Develop frameworks to foster inclusive and meaningful engagement and participation. • Level national digital platforms and applications to enable online participation 	<ul style="list-style-type: none"> • Develop guidelines and provisions to increase transparency and collaboration in the development of smart city tools and services
Civil Society Organizations	<ul style="list-style-type: none"> • Support the active participation of local communities • Represent the needs of vulnerable groups in consultative processes 	<ul style="list-style-type: none"> • Hold the public sector accountable for the commitments, actions and progress of smart city projects
Academia, research institutions and professional bodies	<ul style="list-style-type: none"> • Research on participatory methods and community engagement • Join steering committees and participate in advisory groups 	<ul style="list-style-type: none"> • Support the monitoring and evaluation of smart city projects and commitments
Private Sector	<ul style="list-style-type: none"> • Develop of tools and platforms to enhance participation 	<ul style="list-style-type: none"> • Ensure smart city commitments and transparency measures are embed in tools

2.2.3 Digital Literacy

People-centred smart cities need to build the appropriate capacity and skills to leave no one behind. They must increase competencies not only on digital technologies but also on information for the public good, including dissemination, collection, storage and processing. Learning opportunities to increase capacities and digital skills should allow all stakeholders to respond to new challenges and opportunities posed by digital transformation and have the competencies to fully participate in urban life.

Capacity Development

All stakeholders in a people-centred smart city have equal access to training and capacity development opportunities to ensure everyone has the capabilities to actively participate in

smart city development and benefit from smart city tools and services. Learning opportunities should be designed and tailored according to the diverse literacy needs, competency levels, location and learning styles to respond to the evolving pace of technology and local needs.

Local and Regional Governments, in collaboration with other governmental levels and other relevant stakeholders, should ensure equal access to training locally, addressing digital literacy divides, and adapting programs to diverse learning styles by:

- Developing digital training, in-person engagements and awareness actions in community centres, libraries and schools targeting the following groups:
 - o Parents, caregivers and teachers: to support younger generations in safely accessing the internet.
 - o Residents: to interact with public and private online services and safely participate in digital spaces.
 - o Local businesses, start-ups, organizations and local communities: to learn coding and help generate digital tools for the city.
 - o Adults and elderly persons: media and information literacy and digital skills classes to access smart city services and information and increase resilience to digital threats.
- Implementing training, mentorship and peer-learning opportunities to increase capabilities of city officials such as:
 - o Learning opportunities on emerging technologies, digital innovation, data analysis, coding, accessibility, sustainability, smart city planning, digital public participation, inclusive design and evidence-based policymaking.
 - o Capacity building actions for operating and maintaining digital infrastructure and data platforms.
- Developing strategies like public-private partnerships, incentives to local organizations and businesses and collaborative networks.
- Conducting training needs assessments, focus groups and media and information literacy and digital skills surveys to identify specific needs, strengths and gaps.
- Monitoring and evaluating interventions, identifying key indicators and benchmarks to measure meaningful outcomes and lessons learned.

National Governments, in collaboration with other governmental levels, should design and adapt educational curricula and implement capacity building programmes and media and information literacy interventions by:

- Tailoring programmes and curricula to specific groups such as women and girls, children and youth, as well as older persons, persons with disabilities, migrants, refugees and internally displaced persons, Indigenous Peoples and those in vulnerable situations³⁷.
- Establishing partnerships and allocating resources to increase the financial capacities of Local and Regional Governments, enabling them to invest in capacity development.

³⁷ General Assembly A/79/L.2- The Pact Of The Future- Annex I: Global Digital Compact: https://www.un.org/global-digital-compact/sites/default/files/2024-09/Global%20Digital%20Compact%20-%20English_0.pdf

- Leverage online platforms, tools and resources in diverse languages and accessible formats³⁸ for open, scalable and accessible programmes.

Civil Society Organizations and local businesses should support the implementation of capacity development opportunities by:

- Providing technical support, research contributions and delivery of curricula.
- Providing insights on the curricula design based on needs assessments and research.

Academia, research institutions, and professional bodies should lead the delivery of capacity building programs by:

- Partnering with CSOs and the local administration.
- Adapting contents and curricula to various stakeholders and learning styles.

Private Sector, in collaboration with other stakeholders, should support the implementation of capacity building programs by:

- Developing learning platforms that include the learning needs and capacities of all stakeholders.
- Partnering with organizations to deliver capacity building programs.

Digital Skills

People-centred smart cities promote the development of basic digital skills for everyone to understand and interact with smart city technologies, and promote lifelong, intergenerational and interdisciplinary upskilling opportunities for advanced skills.

Local and Regional Governments, in collaboration with other governmental levels and other relevant stakeholders, should provide lifelong learning opportunities to acquire digital skills, to co-create smart city tools and to understand the implications of technologies:

- Offer basic digital skills training to residents in areas such as data use, data protection, accessing digital services and cybersecurity with a focus on low-income neighborhoods and people in vulnerable situations.
- Enhance skills and competencies of public sector officials to design and implement smart city initiatives and manage smart city tools.
- Offer training programs and workshops for both public and private sector employees to develop media and information literacy and advanced digital skills.
- Facilitate active participation of public officials and relevant stakeholders in open-source communities.
- Promote open access to digital educational services, tools and information.

National Governments should develop competency frameworks in digital transformation for all stakeholders, implementing digital skills strategies to enhance educational cooperation between governmental entities at all levels, the private sector, civil society organizations, and research institutions to build digital skills and increase technological awareness at all educational levels by:

³⁸ Ibid.

- Adapting or developing competency frameworks for public sector officials to design and enact strategies and policies for inclusive, trusted, secure and user-centred smart city services³⁹.
- Adapting or developing competency frameworks for residents, design and roll out training and awareness campaigns to ensure that all users have the skills and knowledge to safely and critically interact with content and information online and to make informed choices and provide or withdraw informed consent⁴⁰.
- Including technology education as well as media and information literacy and digital skills in the educational curricula as early as primary school, teaching about the risks and opportunities of digital transformation.
- Upskilling workforces in the public and private sectors to collect, process, analyze, store and transfer data safely and securely.
- Developing vocational upskilling and reskilling training for workers in occupations impacted by digitalization and automation to promote decent work⁴¹.

Civil Society Organizations, in collaboration with other stakeholders, should:

- Support Local and Regional Governments and Academia in implementing upskilling programmes for residents, organizations and local businesses.

Academia, research institutions, and professional bodies, in collaboration with other stakeholders, should deliver upskilling initiatives:

- Design and deliver smart city development focused educational curricula, courses, and workshops for stakeholders.

Private Sector entities, in collaboration with other stakeholders, should also provide upskilling opportunities:

- Upskill workers in areas such as data management and use of technology with a special focus on workforces that may be impacted by digitalization and automation.

Table 3- Basic conditions and recommendations on Digital Literacy

Thematic Area: Digital Literacy		
Principle	Capacity Development	Digital Skills
Objective	Ensure equal access to training and capacity development opportunities	Promote the development of basic digital skills and lifelong, intergenerational and interdisciplinary upskilling opportunities
Immediate Actions		

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Ibid.

Local and Regional Governments	<ul style="list-style-type: none"> • Ensure equal access to learning through partnerships, incentives, digital training and in-person engagements 	<ul style="list-style-type: none"> • Offer basic technology skills for residents • Offer training programs and workshops for public and private sector employees to develop advanced digital skills
National Governments	<ul style="list-style-type: none"> • Develop or adapt capacity building programmes, educational curricula and tools 	<ul style="list-style-type: none"> • Develop competency frameworks in digital transformation • Include technology education and digital skills in the educational curricula
Civil Society Organizations	<ul style="list-style-type: none"> • Support implementation of capacity building actions 	<ul style="list-style-type: none"> • Support the local government in implementing upskilling programmes
Academia, research institutions and professional bodies	<ul style="list-style-type: none"> • Deliver capacity building programs and curricula 	<ul style="list-style-type: none"> • Design and deliver educational curricula, courses, and workshops
Private Sector	<ul style="list-style-type: none"> • Develop platforms that include learning needs and capacities 	<ul style="list-style-type: none"> • Upskill workforces

2.2.4 Shared Prosperity

People-centred smart cities need to support the development of a local digital ecosystem of entrepreneurs, SMEs, local business and local organizations that design and deliver tools and services through local investments and projects that prioritize local economic growth. The aim is to ensure that digital tools and services address local needs and contribute to reducing socio-economic and geographical inequalities, fostering shared prosperity, and increasing regional integration.

Local Digital Ecosystem

People-centred smart cities nurture an inclusive and sustainable local digital economy by creating economic opportunities for local stakeholders and prioritizing local job creation. Investments and incentives must drive the development of innovative smart city tools and services, improving quality of life and boosting economic growth.

Local and Regional Governments, in collaboration with other governmental levels and other relevant stakeholders, should integrate local entrepreneurship, community co-creation of smart city solutions to benefit the local digital ecosystem and generate local revenues by:

- Developing or strengthening frameworks for public and private collaborations, local innovation and entrepreneurship, and community ownership of digital infrastructure to enhance the competitiveness and attractiveness of the local economy.

- Leveraging digital technologies to boost local industries and businesses with a focus on local SMEs, community spaces, entrepreneurs and local businesses.
- Leveraging data to assess and transform the informal economy and job creation.
- Running initiatives such as open innovation or innovation-based procurements to include SMEs, start-ups or community-based organizations in smart city projects.
- Creating incentives to local businesses, start-ups, organizations and community groups to develop solutions through training centres, innovation labs/hubs, test beds, accelerators and open-source communities.
- Strengthening networks of collaboration to create opportunities for people and community groups to own or co-own digital infrastructure and design digital tools and services for their communities.

National Governments, in collaboration with other governmental levels, should create an enabling environment, through regulation and investments, to steer innovation by:

- Developing legal frameworks to protect consumer rights, promote competition and digital entrepreneurship, nurture digital talent and skills, and enhance trust in the digital economy⁴².
- Fostering an open, fair, inclusive and non-discriminatory local digital ecosystem that enables micro-, small and medium-sized enterprises to access and compete in the digital economy with a focus on women-owned businesses and young entrepreneurs⁴³.

Civil Society Organizations and Academia, in collaboration with other relevant stakeholders, should support community groups and local organizations by:

- Helping in the design of local digital tools that address community challenges.
- Providing technical support and assistance to enhance local entrepreneurship.

Private Sector, including technology companies, SMEs, local businesses and developers, should offer sustainable job opportunities in the local digital economy by:

- Channeling investments and increasing collaboration with the public sector and other relevant stakeholders to promote the development of sustainable local digital ecosystems, for example, through joint ventures.
- Facilitating access to financing to include the local digital ecosystem of vendors in the development of smart city tools.

Territorial Development

People-centred smart cities prioritize local wealth and shared prosperity by mitigating the impactful consequences of digitalization and the digital economy on the urban realm. This may include harnessing technologies and data to enhance integrated urban and territorial planning, increasing rural/urban connections and synergies for greater regional development and integration.

⁴² Ibid.

⁴³ Ibid.

Local and Regional Governments, in collaboration with other governmental levels and other relevant stakeholders, should balance digital innovation with territorial development to build connected and prosperous cities that address existing inequalities⁴⁴ by:

- Promote smart city principles that connect local economic growth with integrated territorial policies and adequate investments at the national, subnational and local levels.
- Prioritizing local economic growth by developing smart city tools and locally owned platforms that help mitigate the impactful effects of digitalization on urban life and the local economy.
- Leveraging technologies and data to ensure that urban and territorial planning coordinates the spatial location and distribution of economic activities, building on economies of scale and agglomeration, proximity and connectivity for increased productivity, competitiveness and prosperity⁴⁵.
- Monitoring and reporting on the impact of technology and smart city projects on economic development, job creation, prosperity and wellbeing.
- Supporting the care economy by strengthening collaboration with national and subnational governments to integrate or design smart city services aimed at reducing spatial inequalities and enhancing the quality of life of families, caregivers, children, youth, elderly people and people with disabilities.

National Governments, in collaboration with other governmental levels and other relevant stakeholders, should strengthen shared prosperity, inter-city relations and synergies by:

- Promote a digital framework for territorial systems that integrate urban and rural functions into the national and subnational spatial frameworks and the systems of cities and human settlements.
- Supporting inter-municipal cooperation to ensure that smart city strategies, data and digital solutions are leveraged for urban and territorial planning and contribute to increase productivity and enhance urban planning at the city-region level⁴⁶.
- Providing appropriate fiscal incentives and targeted subsidies and enhancing local fiscal capacities to empower local authorities to develop smart city projects that help redress social inequalities and promote cultural diversity⁴⁷.
- Developing standards to monitor the impacts of digitalization on the territory such as urban sprawl, socioeconomic inequalities and the digital divide.

Civil Society Organizations, in collaboration with local communities, should:

- Advocate for the development of smart city tools that promote increased quality of life of vulnerable groups.

Academia, research institutions, and professional bodies, should:

⁴⁴ UN-Habitat Strategic Plan 2020-2033. https://unhabitat.org/sites/default/files/documents/2019-09/strategic_plan_2020-2023.pdf

⁴⁵ Ibid.

⁴⁶ UN-Habitat- International Guidelines on Urban and Territorial Planning. Url: https://unhabitat.org/sites/default/files/download-manager-files/IG-UTP_English.pdf

⁴⁷ Ibid.

- Provide technical support and evaluate the impact of digital tools on territorial development.

Private Sector, including SMEs, technology companies and developers, should design and deliver smart city tools that increase inter-municipal cooperation by:

- Developing open-source and scalable smart city tools and platforms to increase cooperation across cities and territories.

Table 4- Basic conditions and recommendations on Shared Prosperity

Thematic Area: Shared Prosperity		
Principle	Local Digital Ecosystem	Territorial Development
Objective	Nurture an inclusive and sustainable local digital ecosystem	Prioritize local wealth and shared prosperity, and harness technologies to enhance urban planning
Immediate Actions		
Local and Regional Governments	<ul style="list-style-type: none"> • Enable micro, SMEs, local business and community organizations to access and compete in the digital economy • Channel investments to integrate local entrepreneurship and community co-creation 	<ul style="list-style-type: none"> • Design smart city tools that help mitigate the impactful effects of digitalization on urban life and support the care economy
National Governments	<ul style="list-style-type: none"> • Create an enabling environment to support innovation and local entrepreneurship 	<ul style="list-style-type: none"> • Support inter-municipal cooperation in the development of smart city solutions
Civil Society Organizations	<ul style="list-style-type: none"> • Support community groups and local organizations in designing local digital tools to tackle local challenges 	<ul style="list-style-type: none"> • Advocate for the development of smart city tools that increase shared prosperity
Academia, research institutions and professional bodies	<ul style="list-style-type: none"> • Support community groups and local organizations in designing locally owned digital tools 	<ul style="list-style-type: none"> • Evaluate the impact of digital tools on territorial development.
Private Sector	<ul style="list-style-type: none"> • Facilitate access to financing to support the development of smart city projects 	<ul style="list-style-type: none"> • Develop open-source and scalable smart city tools and platforms

2.2.5 Environmental Sustainability

People-centred smart cities place both people and the planet at the center of urban planning balancing the social, environmental and economic impacts of technologies. These cities adopt low-carbon strategies, promote circular economy practices, and leverage digital tools to monitor and reduce their environmental footprint. They also harness technologies to regulate resource consumption, mitigate risks, enhance adaptation, and build urban resilience.

Environmental Impact

People-centred smart cities align digitalization with sustainable development to promote a sustainable digital transition by prioritizing digital infrastructure and developing tools that reduce the environmental impact of digitalization, minimize pollution and conserve natural resources, including managing energy consumption and electronic waste, promoting device reuse, investing in sustainable data centers, adopting the principles of digital sobriety, and eco-conception and mitigating other environmental issues posed by digital infrastructures.

Local and Regional Governments, in collaboration with National Governments and other relevant stakeholders, should integrate digital transformation efforts with environmental sustainability objectives to enhance urban resilience and promote sustainable digital transformation by:

- Leveraging digital technologies and data to develop smart city tools that monitor and reduce local emissions, manage waste effectively, increase resilience, and promote clean energy.
- Collecting data on the direct and indirect environmental impact of digital infrastructure, services, platforms, and data centers on emissions, energy consumption, water, pollution and extractive practices and increase data sharing with the National Government.
- Prioritizing digital infrastructure, tools and services that minimize pollution and conserve natural resources – e.g. by transitioning to flexible, decentralized energy systems supported by solar, wind and geothermal power and flexible storage systems, investing in innovative cooling techniques or renewing equipment.
- Incorporating life cycle assessment (LCA) and environmental impact assessments to evaluate the environmental impact throughout the product lifecycle of smart city solutions.
- Promoting sustainable digital transformation practices in the public administration:
 - o Developing sustainability guidelines on data management.
 - o Optimizing digital devices and hardware to limit their impacts and promote their reuse, extending the lifespan of the equipment and managing e-waste.
 - o Prioritizing open-source software.
 - o Including environmental provisions as a selection criteria in procurement processes.

National Governments, in collaboration with other governmental levels, should set standards, enforce regulations and provide incentives to mitigate the environmental impacts of digitalization by:

- Developing legal frameworks and standards to measure energy consumption and the environmental impact of digital infrastructure, ensuring adherence through regular monitoring and reporting mechanisms as well as promoting environmental impact assessments to monitor and potentially mitigate the effects of technologies on the environment⁴⁸.
- Enforcing international frameworks and embed sustainability principles in national policies and regulations to ensure digitalization aligns with sustainability goals, in areas such as e-waste management, energy efficiency, green technology standards and green public procurement.
- Advocating for harmonizing trade code systems to manage and scrutinize global trade in e-waste to mitigate challenges such as illegal trading and dumping of used electronics.
- Ensuring that digital transformation regulations cross-reference complementary climate and environmental policies and frameworks. For example, by integrating digital sobriety, eco-design and sustainable data center operations into the national digital transformation strategy.
- Providing subsidies, tax incentives or grants to encourage investment in sustainable digital infrastructure, renewable energy and eco-friendly technologies by the private sector.
- Supporting policies that encourage the circular economy of digital devices, such as reuse, recycling and extended product life cycles and right to repair principles.

Civil Society Organizations, in collaboration with other stakeholders, should promote and advocate for sustainable practices in the digital realm by:

- Advocating for efficient resource utilization and conservation in the development of digital tools and infrastructures.

Academia, research institutions, and professional bodies, in collaboration with other stakeholders, should promote sustainable digitalization practices by:

- Conducting research to prototype tools that promote sustainable digital transitions, including energy-efficient algorithms and eco-conception in digital tools.
- Using data to measure the impact of digitalization and assess the environmental impact of digital tools and infrastructure and recommend improvements in energy consumption, e-waste management and resource conservation.
- Facilitating the exchange of knowledge on best practices through conferences, publications and partnerships with other academic institutions.

Private Sector, including technology companies, SMEs, developers, and local businesses should implement sustainability measures in the development of tools by:

- Developing digital devices and technologies that are energy-efficient, durable and easily recyclable, promoting the use of renewable materials and circular product life cycles.

⁴⁸ UN-Habitat- International Guidelines on Urban and Territorial Planning. Url: https://unhabitat.org/sites/default/files/download-manager-files/IG-UTP_English.pdf

- Building and operating data centers with reduced energy consumption by investing in renewable energy sources, adopting energy-efficient cooling systems and employing eco-conception principles.
- Adopting digital sobriety principles by reducing unnecessary digital processes and optimizing energy use in software and hardware solutions.
- Leveraging data and technologies to deliver smart city solutions that prioritize sustainability such as green buildings, smart energy grids and green transportation systems.

Urban Resilience

People-centred smart cities safeguard natural resources and enhance urban resilience to various shocks including climate change, humanitarian emergencies, wars and natural disasters⁴⁹ emphasizing the need for proactive risk management, mitigation and adaptation strategies. Moreover, their efforts should focus on reducing greenhouse gas (GHG) emissions, managing droughts, air quality, water shortages and extreme weather events while enhancing their ability to respond to both environmental and man-made disasters. This should be achieved through forward-thinking, planning, emergency preparedness and renewable energy adoption, which leverage data and digital technologies to ultimately help cities increase their capacity to adapt to and mitigate risks such as climatic hazards, conflicts and other crises.

Local and Regional Governments, in collaboration with other governmental levels and other relevant stakeholders, should leverage data and technologies to increase urban resilience by:

- Leveraging data and technologies to ensure sustainable use and conservation of biodiversity⁵⁰ and to address challenges such as deforestation, biodiversity loss, soil degradation, water and energy consumption by technologies, emergency preparedness, food security, waste management and air quality.
- Implementing strategies for efficient resource utilization and conservation by promoting low-carbon consumption and production patterns and encouraging the growth of circular economy practices that prioritize reuse and recycling.
- Leveraging the potential of digital planning tools and data platforms (e.g. local digital twins, urban observatories or life-cycle assessment tools) to enhance emergency preparedness, land-use and urban planning.
- Encouraging 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 energy⁵¹.
- Developing campaigns to influence negative impacts from production and consumption patterns and promote ethical and responsible digital practices, including corporate responsibility.

⁴⁹ UNDRR- Sendai Framework for Disaster Risk Reduction 2015-2030. url: <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>

⁵⁰ UNEP- Kunming-Montreal Global Biodiversity Framework- CBD/COP/DEC/15/4

⁵¹ UNFCCC- The Paris Agreement

- Designing smart city solutions and investing in digital infrastructure that maintain and restore core government functions in times of crisis such as conflicts, situations of forced displacement and war.

National Governments, in collaboration with other governmental levels and other relevant stakeholders, should enact frameworks and promote initiatives that safeguard natural resources, including:

- Promoting frameworks and initiatives to manage energy consumption through steering urban service providers (e.g. power companies) and leveraging innovations in data management and infrastructure to mitigate the environmental impact of data centers, platforms and systems, and ensure the appropriate security, resilience and continuity during emergencies, crises and conflicts.
- Investing in emergency preparedness and resilience actions such as disaster warning mechanisms (such as data platforms, digital tools, command and control centres, urban observatories), as well as disaster response and risk reduction mechanisms, including a contingency plan for digital infrastructure.
- Collaborating with Local and Regional Governments to develop shared sustainability and resilience indicators and methods to align local actions with national and global sustainability strategies.
- Measuring and scrutinizing the environmental impacts of multinational technology corporations.

Civil Society Organizations, in collaboration with other stakeholders, should advocate for efficient resource utilization and conservation in the development of digital tools by:

- Creating awareness on sustainable practices and green solutions.

Academia, research institutions, and professional bodies, in collaboration with other stakeholders, should promote educational curricula and support the design of sustainable smart city tools by:

- Creating academic programs and courses for residents and public sector staff that focus on the intersection of smart city tools, digitalization and sustainability.
- Delivering training to design and manage environmentally responsible technologies.
- Partnering with governments and the private sector to co-develop sustainable digital solutions and smart city innovations that mitigate environmental challenges posed by digital infrastructure.

Private Sector, including technology companies, should be legally responsible and accountable on the use of technologies and their environmental impact by:

- Implementing take-back programs for electronics to promote recycling and reuse and invest in the refurbishment of digital devices.
- Investing in green technologies (e.g. through direct investments, green bonds or similar instruments) having a clear priority on clean and renewable energy sources to manage energy consumption of infrastructure and platforms.

Table 5: *Basic conditions and recommendations on Environmental Sustainability*

Thematic Area: Environmental Sustainability		
Principle	Environmental Impact	Urban Resilience
Objective	Develop tools that reduce the environmental impact of digitalization, minimize pollution, and conserve natural resources.	Safeguard natural resources and enhance urban resilience to various shocks, natural disasters and crises.
Immediate Actions		
Local and Regional Governments	<ul style="list-style-type: none"> • Collect data on the direct and indirect environmental impact of digital transformation • Prioritize digital infrastructure, tools and services that minimize pollution and conserve natural resources 	<ul style="list-style-type: none"> • Leverage digital planning tools, data platforms and technologies to increase urban resilience
National Governments	<ul style="list-style-type: none"> • Set national standards and regulations for energy consumption and pollution reduction of digital infrastructure • Provide subsidies, tax incentives or grants to encourage investment 	<ul style="list-style-type: none"> • Promote frameworks and initiatives to manage energy consumption and sustainable use of natural resources.
Civil Society Organizations	<ul style="list-style-type: none"> • Advocate for efficient resource utilization and conservation in the development of digital tools 	<ul style="list-style-type: none"> • Create awareness and advocate for efficient resource utilization and conservation
Academia, research institutions and professional bodies	<ul style="list-style-type: none"> • Use data to measure the environmental impact of digitalization 	<ul style="list-style-type: none"> • Create academic programs and courses that focus on the intersection of digitalization and sustainability
Private Sector	<ul style="list-style-type: none"> • Develop digital devices and technologies that are energy-efficient, durable, and easily recyclable 	<ul style="list-style-type: none"> • Implement take-back programs to promote recycling and reuse, and invest in green technologies

2.2.6 Governance and Regulations

Effective governance of smart city projects requires coordinated management of digital infrastructure, with clear roles across sectors and multilevel governance to promote sustainability, resilience, and inclusion. Collaboration between governments, the private

sector, academia, and civil society is essential to ensure transparency, accountability, and effective oversight of smart city tools.

A robust regulatory framework is equally vital, ensuring ethical development, data governance, cybersecurity, privacy, and human rights protections. This framework should guide the responsible use of emerging technologies like AI⁵² while supporting agile procurement and financing.

Organizational Structure

Organizational structures at the national and local levels must reflect the evolving transformation and innovation driven by smart cities. These structures should ensure agile, efficient and effective governance by clearly defining roles and responsibilities across different sectors and governance levels. Managing a people-centered smart city requires collaboration from all governmental departments involved in technology, inclusion, and urban development. Institutional arrangements should be adaptable, tailored to local priorities, existing frameworks, and available resources, rather than following a one-size-fits-all approach.

Local and Regional Governments, in collaboration with other governmental levels and other relevant stakeholders, should define organizational arrangements that promote smart city development across units by:

- Assessing and reorganizing the internal structures and processes in the local administration to overcome existing administrative silos, institutional overlaps and bureaucratic procedures that constrain innovation and collaboration.
- Establishing or mandating a dedicated Smart City Unit in charge of overseeing and creating synergies across smart city initiatives and coordination amongst units.
- Defining roles and responsibilities across the administration and increase institutional capacities to govern specific technologies as a complement to regulations, fostering interdepartmental collaboration and coordination, and establishing clear lines of communication and accountability.
- Creating a functional and multidisciplinary committee, taskforce or similar structure to support teams across the administration in designing and deploying digital tools and discuss the design of smart city projects, as well as identifying smart city champions across the local administration.
- Exploring opportunities for collaborating and sharing resources and infrastructure across municipalities to maximize efficiency, reduce costs and enhance access to digital capabilities.
- Recruiting new talent with leadership and technical skills that cover competencies on urban planning and management of digital transformation and data projects.
- Creating a specific office in charge of maintaining and curating data platforms and developing local data governance processes and legal structures.

⁵² UN AI Advisory Board. Governing AI for Humanity (2024): https://www.un.org/sites/un2.un.org/files/governing_ai_for_humanity_final_report_en.pdf

- Considering recruiting leadership roles such as Chief Data Officer, Chief Technology Officer and Digital Inclusion Officer.

National Governments, in collaboration with other governmental levels should promote institutional arrangements that enhance collaboration and coordination, including:

- Appointing an office, or mandate an existing one, in charge of overseeing smart city projects and promote collaboration and coordination.
- Developing frameworks and institutional arrangements to increase collaboration with Local and Regional Governments and across sectors.
- Creating a smart city network of public officials across Local and Regional Governments, international organizations and other relevant stakeholders to share best practices and create synergies.

Civil Society Organizations, Private Sector and Academia should:

- Participate in steering committees and smart city networks.
- Promote educational curricula on smart cities aimed at strengthening competencies in the intersection of technology, urban development and project management.

Multi-level Digital Governance

All levels of government have responsibilities for the development of an enabling and robust regulatory framework and an agile multi-level digital governance that ensures consistency of policies and processes. Effective and sustainable regulatory arrangements, policies and regulations at the national level must be transparent and preserve local autonomy based on the subsidiarity and proportionality principles as well as have independent oversight⁵³.

Smart City and related national regulations should be developed in consultation with Local and Regional Governments and other relevant stakeholders, to ensure these instruments address the specific needs and local contexts and are based on local capacities to instrument these regulations through local legislation.

National Governments, in collaboration with Local and Regional Governments and other relevant stakeholders, should create and enact effective, relevant and transparent regulatory frameworks that support sustainable and inclusive urban development, including:

- National Urban Policies with smart city commitments and National Digital Strategies that include an urban development dimension.
- A national Smart City Strategy or Smart City Framework to provide a long-term vision on how technology can support sustainable urban development.
- Regulations and standards to govern digital technologies and infrastructure in areas such as data protection, cybersecurity and risks mitigation, business continuity and universal broadband access policies.
- Open-source policies for the development of tools and services, including provisions for prioritizing open-source solutions when developing smart city tools.

⁵³ UNESCO Guidelines for the Governance of Digital Platforms. <https://www.unesco.org/en/internet-trust/guidelines>

- Regulatory and governance approaches and frameworks to promote open, safe, secure and trustworthy AI systems⁵⁴.
- Dedicated data governance policies and strategies that define processes, rules and roles as well as oversee data sharing, data use and data infrastructure, including technical standards to enact technological interoperability and facilitate data sharing. Additionally, develop a data ethics framework to guide public servants in the appropriate and responsible use of data⁵⁵.
- Policy evaluation mechanisms and strategies for monitoring and regularly updating regulations to keep pace with technological advancements and challenges posed by emerging technologies.

Local and Regional Governments, in collaboration with other governmental levels and other relevant stakeholders, should localize national and international legislation into local regulations, including:

- Masterplans, urban policies and other urban development instruments that embed smart city outcomes.
- A Smart City Strategy and an Action Plan to guide the development of tools and use of technologies based on agreed principles, actions and resources.
- A Data Strategy that includes a data governance framework and includes provisions for open data, data protection and data sharing.
- Policies and protocols to govern technologies in areas such as privacy, cybersecurity and use of emerging technologies. Incorporate data protection, privacy and transparency measures in smart city governance processes including the disclosure of the use of technology and whenever feasible mechanisms for residents to opt out or opt in.
- Clear governance arrangements and processes for secure interoperability of smart city technologies, interoperable design and minimum interoperability mechanisms to enable the safe integration of data from multiple sources and digital exchanges.
- Adopt smart city international standards to measure the performance, efficiency and effectiveness of smart city policies and projects and to enhance evidence-based policymaking.
- Regulatory sandboxes to test emerging technologies or specific applications, to assess the most effective regulatory interventions to be adopted.

Civil Society Organizations should:

- Ensure the enforcement of regulations and assess potential impact of policies and legal frameworks.

Academia, research institutions and professional bodies should:

⁵⁴ UN General Assembly's Resolution 78/L.49 "Seizing the opportunities of safe, secure and trustworthy artificial intelligence systems for sustainable development". url: <https://documents.un.org/doc/undoc/ltd/n24/065/92/pdf/n2406592.pdf?token=Xxwqqb7TZtTl6kSgG4&fe=true>

⁵⁵ OECD (2023). Smart City Data Governance: Challenges and the way forward. url: https://www.oecd-ilibrary.org/urban-rural-and-regional-development/smart-city-data-governance_e57ce301-en;jsessionid=YmwfqiQZsvYlpEz-Hb4ltQDUL9k84FPIJ-i6PSo.ip-10-240-5-148

- Conduct research and future scenario-analysis to inform regulations.

Private Sector, including technology developers, should:

- Comply with regulations when developing smart city tools and digital infrastructure.

Financing and Procurement

Business models and agile procurement processes for the development of smart city tools and services should be agile, inclusive and sustainable to guarantee that innovations are accessible and equitable for all, retain control over digital assets and data, ensure uptake, scalability and maintenance, avoid vendor lock-in practices and contribute to economic and environmental sustainability.

Local and Regional Governments, in collaboration with other governmental levels and other relevant stakeholders, should develop financing instruments and procurement practices to sustain smart city tools and services including:

- Developing financing and business models with emphasis on diverse funding sources, revenue-generating contracts, cost-benefit analysis, savings, risk management and scalability. Explore using guarantees such as municipal bonds, government-backed bank loans and green bonds.
- Implementing innovative practices such as proof-of-concept iterations and sandboxes to identify and test alternative business models and scale-up strategies.
- Developing financial models, frameworks and incentives for communities and CSOs to self-organize and finance digital infrastructure projects. Support community-based financing, social procurement, microfinance projects and participatory budgeting.
- Exploring business models to co-finance physical infrastructure such as sensors and data centers, putting privacy and security as key conditions for agreements, investments and management by the private sector.
- Aligning with national regulations to implement and experiment with innovative approaches to public procurement. In the absence of national legislation, provide the legal basis and standards to steer the procurement of smart city technology across the local administration, including evaluation criteria that includes assessing the social, ethical and environmental effects of digital tools and services.
- Leveraging procurement to foster innovation within the local digital ecosystem such as challenge-based innovation, design contests, performance based-contracting and pre-commercial procurement methods, calls for solutions, among others.

National Governments, in collaboration with other governmental levels and other relevant stakeholders, should enact regulatory frameworks to finance and procure smart city technologies and digital infrastructure such as:

- Legal structures to finance smart city projects such as Public-Private Partnerships, Trusts, Cooperatives, and revenue models.
- Measures to allocate resources from Universal Service and Access Funds to finance local digital infrastructure projects and provide concessional financing through public resources, development banks or international agencies.
- Financial resources to Local and Regional Governments, including funding for research and development both for technological and social development, funding for

prototyping and partnership with the private sector, and supporting sustainable funding mechanisms for the deployment and operation of sustainable smart city tools.

- Evaluate integrating smart city components in urban development projects (e.g.: waste management or transportation) to encourage investments in digital infrastructure.
- Regulations and policies to foster innovative approaches for public procurement of digital technologies, including standard clauses for the procurement of new and emerging technologies, algorithmic systems, open-source solutions, clauses on accessibility and sustainability, and conducting human rights due diligence.
- Provisions to ensure that digital infrastructure provided by a third-party benefits urban development by enhancing transparency, disclosure of economic benefits, and public control over data.

Civil Society Organizations should play a key role in ensuring provisions for public procurement:

- Advocate for the inclusion of universal design and accessibility standards in procurement.

Academia, research institutions and professional bodies should:

- Conduct research and advice on sustainable financing and procurement practices.

Private Sector, including technology developers should:

- Comply with procurement standards.
- Explore innovative business models, provide financing and engage in public-private partnerships.

Table 6- Basic conditions and recommendations on Governance and Regulations

Thematic Area: Governance and Regulations			
Principle	Organizational Structure	Multi-level Governance	Financing and Procurement
Objective	Ensure an agile, efficient, and effective governance of smart city initiatives	Development of an enabling and robust regulatory framework and an agile multi-level digital governance	Agile and sustainable business models and procurement processes for the development of smart city tools and services
Immediate Actions			
Local and Regional Governments	<ul style="list-style-type: none"> • Establish or mandate a dedicated Smart City Unit • Define roles and responsibilities in smart city development 	<ul style="list-style-type: none"> • Enact regulations and standards to govern digital technologies • Develop policy evaluation mechanisms for 	<ul style="list-style-type: none"> • Develop financing and economic models with emphasis on diverse funding sources

		monitoring regulations	<ul style="list-style-type: none"> Leverage procurement to foster innovation
National Governments	<ul style="list-style-type: none"> Appoint an office in charge of overseeing smart city projects Create a smart city network 	<ul style="list-style-type: none"> Localize national and international legislation into local regulations Incorporate privacy rights measures in smart city governance processes 	<ul style="list-style-type: none"> Develop legal structures to finance smart city projects and allocate resources Develop regulations and policies to foster innovative public procurement
Civil Society Organizations	<ul style="list-style-type: none"> Participate in steering committees and networks 	<ul style="list-style-type: none"> Ensure enforcement of regulations 	<ul style="list-style-type: none"> Advocate for the inclusion of universal design and accessibility standards in procurement
Academia, research institutions and professional bodies	<ul style="list-style-type: none"> Help assess institutional capacities 	<ul style="list-style-type: none"> Conduct research to inform regulations 	<ul style="list-style-type: none"> Conduct research and advise on sustainable financing and procurement
Private Sector	<ul style="list-style-type: none"> Participate in steering committees and networks 	<ul style="list-style-type: none"> Comply with regulations 	<ul style="list-style-type: none"> Comply with procurement standards

2.2.7 Digital Infrastructure and Smart City Services

Digital infrastructure is a key component to allow people and other stakeholders to develop smart city tools such as real-time traffic management systems, metering systems and waste management solutions, among others. To build secure and resilient digital infrastructure that safeguards public trust, people-centred smart cities must provide the basis upon which smart city tools and services can be built. This includes universal high-speed internet access, robust digital identity and payment systems, open data platforms, interoperable systems, and robust cybersecurity protocols and interoperability standards.

There is not a unique business model for expanding, funding and financing digital infrastructure; government owned and operated solutions, community networks and public-private partnerships may be leveraged based on existing resources and national regulatory

frameworks. People-centred smart cities should balance risks, potential benefits and oversight to monitor and own the digital assets and data generated by these systems⁵⁶.

Digital Infrastructure

People-centred smart cities strive for control and oversight over their digital infrastructure to safeguard public trust. This can be achieved either by ownership, co-ownership with stakeholders to build local digital economies, or by enacting regulatory measures to ensure public benefit, security and competitiveness among providers.

Local and Regional governments, in collaboration with other governmental levels and other relevant stakeholders, should increase the adequacy of local digital infrastructure through investments and regulatory actions that maintain oversight and secure smart city assets⁵⁷ including:

- Building municipal networks of internet infrastructure such as small cell, broadband, WiFi, fiber and mobile networks. In addition, implement free public wi-fi networks and Internet access points in public buildings of the city administration and public spaces.
- Supporting the development of community networks and other models to manage digital infrastructure by communities and organizations.
- Facilitating public-private partnership models to invest in digital infrastructure, implement incentives for private provision of broadband connectivity such as fiscal incentives, subsidies or access to public infrastructure.
- Investing in secure, privacy by design and environmentally sustainable sensor networks, open-source solutions⁵⁸ and other smart city assets to increase the efficiency of urban services such as water, energy and transportation. Investments should also be allocated to expand basic services that support digital infrastructure and platforms (e.g.: electricity, water, etc.).
- Providing safe and interoperable digital infrastructure in key areas such as identity, online authentication⁵⁹, digital payments and data exchange.
- Providing financial support for open-source code development.
- Enforcing standards and practices by the private sector and other actors to protect residents' data privacy, promote equitable access to technology and foster competitive markets.
- Managing access to urban infrastructure including the public right of way, poles, public buildings and other urban assets.

National Governments, in collaboration with other governmental levels and other relevant stakeholders, should provide technical assistance, financial resources and provisions to retain control over digital infrastructure, including:

⁵⁶ UN-Habitat. People-Centred Smart Cities Playbook series: Addressing the Digital Divide. https://unhabitat.org/sites/default/files/2021/11/addressing_the_digital_divide.pdf

⁵⁷ UN-Habitat. People-Centred Smart Cities Playbook Series: Building & Securing Digital Infrastructure. Url: https://unhabitat.org/sites/default/files/2022/06/playbook5_infrastructure_and_security.pdf

⁵⁸ UNDP (2024). Open by design: How open source can drive sustainable urban development. Url: <https://www.undp.org/publications/open-design-how-open-source-can-drive-sustainable-urban-development>

⁵⁹ Ibid.

- Investing in the development of digital infrastructure with a focus on Digital Public Infrastructure (DPI) ⁶⁰ by financing open, interoperable, scalable and safe digital building blocks in areas such as digital payments, identification, data exchange, among others⁶¹.
- Providing National Identification Systems or liaising with subnational governments for an efficient, standardized, secure and interoperable legal ID systems.
- Developing National Broadband Plans that include provisions for underserved areas, last-mile connectivity, open competition of community operators seeking access to the internet infrastructure and “Dig Once” policies.
- Leverage spatial industrial policies to address medium-mile connectivity challenges for example through Regional Internet Exchange Points to improve affordability of digital infrastructure or data center collocation services to foster agglomeration economies.
- Enabling local control, ownership and operation of physical infrastructure and urban assets needed for connectivity and digital infrastructure development.
- Promoting the adoption of open standards, interoperability protocols⁶² and open-source software and platforms and performance standards to regularly evaluate technologies and improve their safety, continuity, resilience and reliability.

Civil Society Organizations, in collaboration with other stakeholders, should enhance the participation of people and communities in the development of digital infrastructure by:

- Supporting local communities in developing community owned infrastructure and designing digital infrastructure based on local needs.

Academia, research institutions, and professional bodies, in collaboration with other stakeholders, should support the development of digital infrastructure by:

- Contributing to research on the use of emerging technologies and digital public infrastructure applications.

Private Sector, including technology developers and financial institutions, should develop and finance digital infrastructure in compliance with standards and regulations:

- Facilitate the supply, design, and commercialization of secure and trustworthy platforms, applications and digital solutions that protect people’s privacy.

⁶⁰ The Universal Digital Public Infrastructure Safeguards Framework (2024) defines digital public infrastructure as: “a set of shared digital systems that should be secure and interoperable, and can be built on open standards and specifications to deliver and provide equitable access to public and / or private services at societal scale and are governed by applicable legal frameworks and enabling rules to drive development, inclusion, innovation, trust, and competition and respect human rights and fundamental freedoms”.

⁶¹ UNDP-Accelerating The SDGs Through Digital Public Infrastructure: A Compendium of The Potential of Digital Public Infrastructure (<https://www.undp.org/publications/accelerating-sdgs-through-digital-public-infrastructure-compendium-potential-digital-public-infrastructure>) and UN-High Impact Initiative: <https://www.dpi-safeguards.org/>

⁶² For example, ITU’s Minimal Interoperability Mechanisms for smart and sustainable cities and communities: https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18458

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

Data Platforms

People-centred smart cities must have control over the data generated by smart city tools and services and manage the whole value chain of urban data for the common good. Therefore, they must build capacities, expertise and data infrastructure- such as data platforms, data processing tools, digital twins, geodata portals- to collect, share and use data within the public administration and across the collaborative smart city ecosystem. A robust data governance strategy must be in place to protect privacy, increase security, promote data sovereignty and enhance interoperability.

Local and Regional Governments, in collaboration with other governmental levels and other relevant stakeholders, should operationalize data governance practices to increase data use, measure the impact of smart city-related investments on urban development, increase transparency and innovation, enhance service delivery and policymaking by:

- Developing data management arrangements for data collection and hosting, sharing and use based on principles such as data protection, informed consent, anonymity, security, data minimization, stewardship and ownership.
- Delivering training for people handling urban data and developing processes for managing the entire data life cycle (collection, use, storage, sharing, deleting, etc.) to protect the privacy of anyone using digital public services or infrastructure.
- Financing and operating data infrastructure such as open data portals, geodata portals, Geographic Information Systems (GIS), data processing tools, and evaluate leveraging technologies such as digital twins and drones to enhance informed decisions and predictive analysis in urban development. Evaluate investing in local data centers, ensuring open-source cloud computing standards.
- Increasing data sharing and collaboration with the private sector, academia and CSOs to open data of interest for urban policies and monitoring of smart city services.
- Using open standards, protocols, metadata standards, data classifications and common definitions to collect, share and use data.
- Developing data sharing models, instruments, licensing terms and data management processes to safely exchange closed and restricted data between offices, departments and municipal companies, subsidiaries and technologies delivered by third parties.
- Opening data of interest to stakeholders and empowering people and communities to access and use urban data to address urban challenges through citizen science and crowdsourcing projects.

National Governments, in collaboration with other governmental levels and other relevant stakeholders, should define standards, guidelines and procedures to enhance data management by:

- Offering national open data platforms to Local and Regional Governments to increase urban data availability.

- Opening data of interest to Local and Regional Governments and developing data strategies to promote reuse of key urban data by Local and Regional Governments.
- Creating networks of data stewards across cities for knowledge exchange and peer learning opportunities.
- Promoting data standards and data quality guides to enhance interoperability transparency, privacy and security of data collection, sharing and use.
- Developing innovative data stewardship models and legal structures (e.g.: Data Trusts, Cooperatives, data sovereignty models, Data Spaces) to promote the ownership and management of data assets by community groups or other stakeholders.

Civil Society Organizations, in collaboration with other stakeholders, should support people and communities in accessing and using urban data by:

- Empowering people to collect and use community data and steward data of interest for specific communities to address local challenges.

Academia, research institutions, and professional bodies, in collaboration with other stakeholders, should support data collection and evidence-based policies by:

- Conducting research and developing tools to make data accessible to communities and support stakeholders in increasing use.
- Supporting the design and evaluation of evidence-based policies.

Private Sector, including SMEs and technology developers, should increase data sharing and provide insights to inform smart city interventions:

- Open data of interest for the city and support the development of analytical tools and portals.
- Provide advanced analytics and insights from urban data and smart city services to improve city planning, resource allocation and service optimization.

Smart City Services

People-centred smart cities prioritize open, green, future-ready, technology-neutral, interoperable and scalable digital tools and services. The ultimate goal is to address urban challenges and create impactful outcomes for people, using technologies and data in a responsible way to empower people and communities through widespread adoption. Therefore, smart city services should be co-created focusing on public value, local needs and based on the subsidiarity principle.

Local and Regional governments, in collaboration with other governmental levels and other relevant stakeholders, should deliver smart city tools in key urban development domains by:

- Leveraging technologies to develop smart city tools that enhance universal access to basic urban services such as water, energy, transportation, healthcare, sanitation and waste management.
- Designing for accessibility with and for people with disabilities, young and older people, people who do not speak the local language, among others.
- Promoting diverse teams in the development of digital technologies and tools to ensure that they are reflective of diverse experiences and points of view.

- Establishing smart city design standards and guidelines and protocols for evaluating technologies covering principles such as privacy, equity, security and interoperability based on community priorities and requirements⁶³.
- Ensuring the participation of beneficiary groups to enhance service delivery during the design, implementation and monitoring of smart city services⁶⁴.
- Promoting an omni-channel and user-centered approach to service delivery to help people needing assistance with connecting with smart city services.

National Governments, in collaboration with other governmental levels, should provide technical support and standards for the development of tools and service delivery by:

- Defining standards across local, regional and national authorities and other relevant stakeholders such as the private sector for local service provision of smart city tools and services⁶⁵ based on the principle of subsidiarity and ensuring the local level has the capacities and resources to exercise such provision⁶⁶.
- Investing in the development or reuse of digital public goods such as open-source software, open data, open artificial intelligence models, architectures, platforms, applications and interfaces.

Civil Society Organizations, in collaboration with other stakeholders, should represent the needs and service demands of communities, particularly vulnerable populations by:

- Participating in needs assessments, consultation processes and feedback mechanisms to ensure that urban services address the needs of people and communities.
- Collaborating with the public and private sectors to co-design smart city services and supporting community groups willing to design their own services.
- Advocating for the delivery of smart city services that empower communities and support vulnerable groups in accessing services.

Academia, research institutions, and professional bodies, in collaboration with other stakeholders, should contribute to the design of smart city tools and services by:

- Developing approaches to user research and needs assessment.
- Supporting the co-design and delivery of tools and services.

Private sector, including SMEs, developers and technology companies, should deliver smart city services that address peoples' needs by:

- Focusing on scalability, open-source solutions, accessibility and interoperability.

⁶³ UN-Habitat People-Centred Smart Cities Playbook series: Building & Securing Digital Infrastructure. Url: https://unhabitat.org/sites/default/files/2022/06/playbook5_infrastructure_and_security.pdf

⁶⁴ UN-Habitat-International Guidelines on Decentralization and Access to Basic Services to All. Url: <https://unhabitat.org/sites/default/files/download-manager-files/International%20Guidelines%20on%20Decentralization%20and%20Access%20to%20Basic%20Services%20for%20all.pdf>

⁶⁵ For example: <https://digitalprinciples.org/#> or <https://www.undp.org/digital/standards>

⁶⁶ UN-Habitat- International Guidelines on Decentralization and Access to Basic Services to All.

- Providing research and development as well as consulting services, to design and pilot technologies and solutions to enhance the delivery of smart city services.
- Contributing to data collection and sharing to improve service delivery.

Table 7 - Basic conditions and recommendations on Digital Infrastructure and Smart City Services

Thematic Area: Digital Infrastructure and Smart City Services			
Principle	Digital Infrastructure	Data Platforms	Smart City Services
Objective	Maintain control and oversight over their digital infrastructure to safeguard public trust and security	Maintain control over the data generated by smart city tools and services and manage the whole value chain of urban data	Develop digital tools and services to address urban challenges and create impactful outcomes for people
Immediate Actions			
Local and Regional Governments	<ul style="list-style-type: none"> • Increase the availability of local digital infrastructure through investments and regulatory actions 	<ul style="list-style-type: none"> • Operationalize data governance processes for data collection and hosting, sharing and use • Invest in data platforms and analytics 	<ul style="list-style-type: none"> • Establish digital service standards • Designing and delivering smart city services in key urban areas such as mobility and waste management
National Governments	<ul style="list-style-type: none"> • Invest in Digital Public Infrastructure and allocate resources 	<ul style="list-style-type: none"> • Offer national open data platforms to local and regional governments to increase urban data availability 	<ul style="list-style-type: none"> • Define standards, roles and responsibilities for local service provision of smart city tools
Civil Society Organizations	<ul style="list-style-type: none"> • Support community owned infrastructure. 	<ul style="list-style-type: none"> • Help people and communities collect and use data. 	<ul style="list-style-type: none"> • Support needs assessments, consultation processes and feedback
Academia, research institutions and professional bodies	<ul style="list-style-type: none"> • Support the development of Digital Public Infrastructure and novel use of technologies 	<ul style="list-style-type: none"> • Develop tools to make data accessible to communities. 	<ul style="list-style-type: none"> • Support the co-design and delivery of tools and services
Private Sector	<ul style="list-style-type: none"> • Facilitate and finance the supply, design and delivery of digital infrastructure 	<ul style="list-style-type: none"> • Open data of interest for the city • Develop analytical tools and portals 	<ul style="list-style-type: none"> • Deliver services and applications based on peoples' needs

3. Implementation of the International Guidelines

The International Guidelines on People-Centered Smart Cities serve as a global framework to foster sustainable, resilient, and inclusive urban environments. The Guidelines are designed to be adaptable, allowing Member States, Local and Regional Governments, and other relevant stakeholders to tailor the principles to fit their specific resources, regulations and needs.

The implementation of the International Guidelines will vary depending on the local context, the institutional and political arrangements and the local priorities. However, there are certain elements that need to be in place to help ensure a successful implementation and effectively mainstream the people-centred smart cities approach in urban development plans, policies and strategies. Effective implementation requires multi-level governance, strong partnerships, resource mobilization and political support at the highest levels to realize the full potential of people-centered smart cities.

3.1 Implementation Mechanism

To ensure successful implementation of the International Guidelines, it is recommended to follow a systematic **step-by-step process** that adapts to the specific needs of different 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, cities can foster innovation, strengthen governance, and create resilient, inclusive urban environments that leave no place and no one behind. While Figure 2 and Table 8 provide an overview of the main actions to follow, those are indicative and require ad hoc analysis and advice.

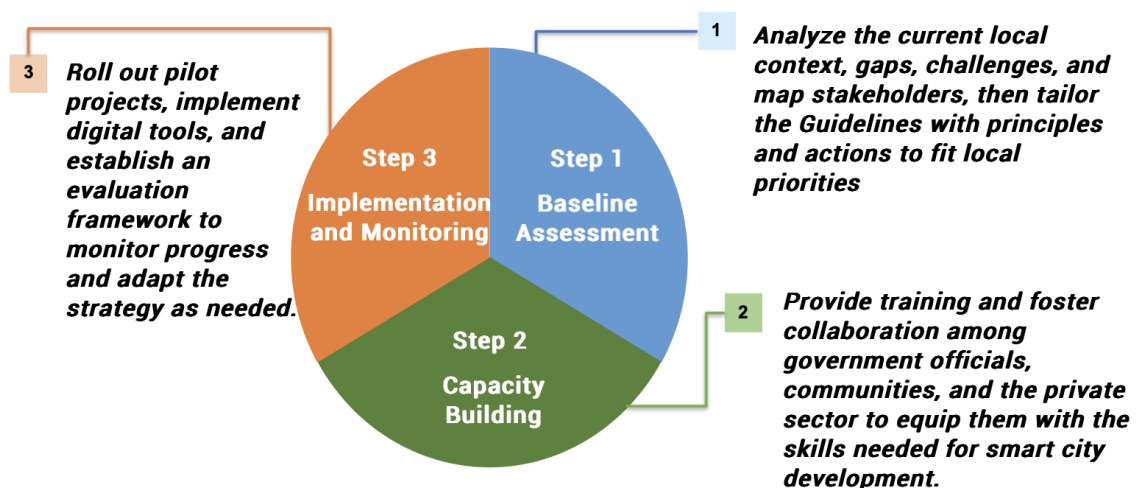


Figure 2 – Step by step approach to implement the guidelines

Table 8- Approach and actions to implement the Guidelines

Step	Objective	Actions
<p>Step 1: Baseline Assessments</p> <p>Understand local contexts, map stakeholders and identify key areas.</p>		
<p>Action 1.1: Assess:</p> <ul style="list-style-type: none"> Evaluate the current state of digital infrastructure, governance frameworks, urban planning and participatory practices. Analyze local challenges such as gaps in technology, social inclusion, and sustainability efforts. Map key stakeholders, including local authorities, civil society, private sector, and vulnerable groups. 	<p>Action 1.2: Prioritize:</p> <ul style="list-style-type: none"> Use the baseline assessment to identify the key areas for improvement in smart city governance, technology integration, and gender inclusion. Establish clear objectives based on the specific needs of each city, considering local social, environmental, and economic factors. 	<p>Action 1.3: Localize the Guidelines:</p> <ul style="list-style-type: none"> Adapt the Guidelines to align with local challenges and opportunities identified, ensuring flexibility to fit the unique needs of each city. Customize key focus areas such as digital inclusion, urban resilience, and sustainable development to match the priorities of local communities.
<p>Step 2: Capacity Building</p> <p>Equip stakeholders with the knowledge, tools, and skills necessary for effective implementation.</p>		
<p>Action 2.1: Build capacities:</p> <ul style="list-style-type: none"> Develop tailored learning programs for local authorities on smart city planning, digital and data governance, sustainability etc. Provide workshops and online courses to strengthen understanding of inclusive and people-centered urban development 	<p>Action 2.2: Community engagement and inclusion:</p> <ul style="list-style-type: none"> Organize community forums to involve people and local communities, including women, people with disabilities, and other vulnerable groups, in the decision-making processes. Focus on digital literacy programmes to empower marginalized communities to participate in smart city initiatives and access digital services. 	<p>Action 2.3: Collaborate with Private Sector, CSOs and Academia:</p> <ul style="list-style-type: none"> Create partnerships between governments, the private sector, CSOs and academia to leverage technical expertise and innovative solutions. Encourage knowledge-sharing platforms that facilitate peer-learning and information exchange. innovation and collaboration across sectors.
<p>Step 3: Implementation and Monitoring</p> <p>Roll out the Guidelines through practical applications and establish mechanisms to monitor progress and impact.</p>		

Action 3.1: Pilot:

- Adopt the Guidelines, prioritizing initiatives that address areas such as digital inclusion, sustainable investments, or resilient public spaces.
- Test new technologies, tools and frameworks aligned with the principles of the Guidelines to assess their effectiveness and scalability.

Action 3.2: Design and deploy Digital Tools:

- Deploy digital platforms for urban management, such as urban observatories or real-time data systems, to monitor key metrics like energy consumption, air quality, or mobility.
- Integrate assistive technologies to ensure accessibility for all, particularly people with disabilities.

Action 3.3: 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.
- Use data collected from the pilot projects and ongoing initiatives to guide future implementations and inform policy decisions.

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4. Annex I – UN Habitat Assembly II Resolution

This Annex will contain the Resolution approved by UNH Assembly [HSP/HA.2/Res.1](#)

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