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Smarter and Inclusive Cities

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Smarter and Inclusive Cities

Acknowledgements

This course was co-created by Arup, Climate-KIC and UNDP for the Mayors for Economic Growth (M4EG) initiative. We are grateful to the many colleagues who contributed to this publication: Sean Lockie, Pasqual Capizzi, Tim Hawley, Luke Thompson, and Max Russels Ralf- Martin Soe and Luiza Schuch de Azambuja from TalTech, Nikhil Chaudhary from Climate-KIC, and Semira Osmanovic and Tina S. Stoum from UNDP.

We are also grateful to our UNDP colleagues Kevin Schmidt, Calum Handforth and Ilaria Mariotti for their review and input.

This publication was produced under the joint EU and UNDP initiative M4EG, funded by the EU since 2017 to support local authorities in the Eastern Partnership.

Cover Photo
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Please cite this resource as Arup, TalTech, Climate-KIC, UNDP (2024) “Smarter & Inclusive Cities” Course Materials, 2024 Urban Learning Center

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Overview of course

Module 1	Inclusivity for Smarter City Development
Module 2	Smarter Governance
Module 3	Planning for Smarter and Inclusive Cities
Module 4	Smarter and Inclusive Cities Projects and Pilots
Module 5	Smarter Implementation, Adoption, and Monitoring

Introduction to the Course

Cities worldwide face increasingly complex challenges while striving to achieve sustainable urban living. It requires a smarter approach to urban development that harnesses the opportunities provided by modern-day technologies while addressing the needs of local communities, businesses, and residents. Smarter and inclusive towns and cities work continuously and systematically with their citizens and stakeholders to bring about innovative and people-centered changes for better future living.

Facilitating smarter and inclusive city development is one of the pathways toward a sustainable urban future. Smarter and inclusive cities make use of the opportunities provided by emerging technologies to facilitate economic growth, social inclusion, and climate action. Making cities smarter and more inclusive can bring about transformational change in towns and cities to improve the quality of life, protect natural resources, and pursue socio-economic development.

The Foundations for Future Readiness module dedicated to understanding Smarter and Inclusive Cities, briefly touched upon what smarter and inclusive cities are, why cities should strive to become smarter and more inclusive, and the drivers and barriers of smarter and inclusive city development. Before diving deeper into the topic, it's important to look back at the lessons learned:

1. There is no single definition of a smart city. The European Commission defines a 'smart city' as a place where traditional networks and services are made more efficient using digital solutions to benefit its inhabitants and businesses. In this sense, technology is not the solution but a means to improve the urban environment – leading to improved quality of life, greater prosperity, sustainability, and engaged and empowered citizens.

2. The goal of the efforts and aspirations toward making cities smarter and more inclusive is to increase the quality of life and to ensure prosperity for all. This ambition has a distinct alignment with several SDGs Sustainable Development Goals. Consequently, smart, and inclusive city development is one of the pathways toward sustainability.

3. Making cities and towns smarter and more inclusive is a continuous process that requires overcoming various barriers and challenges spanning different domains: social, economic, environmental, technological, and Governance. It requires a systemic approach built on effective Governance and collaboration, citizen engagement, and evidence-based decision- and policy-making.

Building on the knowledge gained in the Foundations for Future Readiness, we will take a broader and deeper look at what smarter and inclusive city development is all about.

What will this course cover?
This course introduces several key topics to help municipalities embrace a smarter and more inclusive urban future. It is designed to enable municipalities to gain a broad understanding of how cities can become smarter and more inclusive.

The course aims to provide answers to the following questions:

- Why do we need smarter and more inclusive cities?
- What is a smarter and inclusive city?
- What are the key approaches to fostering innovation in smarter and inclusive cities?
- Why are Governance and strategic planning important for smarter and inclusive cities?
- What is a smarter and more inclusive city strategy?
- How can experimentation and agile management facilitate smarter and inclusive city development?
- Why is monitoring and assessment important for developing smarter and inclusive cities?

What can I expect to gain from this course?
The course includes five modules and provides a range of opportunities to learn. From video summaries and bite-sized content to interactive quizzes and discussions, the course not only provides new learning but also helps you to apply them to your own context. In addition, the course brings examples of smarter and inclusive city development from around the world, providing inspiration and practical insights from other cities and municipalities.

Our learning objectives are:

- Understand the concept of and need for smarter and more inclusive cities.
- Explore the key approaches to fostering innovation in smarter and inclusive cities.
- Build awareness of the key dimensions of smarter and inclusive cities Governance and strategy process.
- Explore how experimentation and agile management can facilitate smarter and inclusive city development.
- Understand the importance of monitoring and assessment of smarter and inclusive cities.

How is this course structured?
The deep-dive course on Smarter and Inclusive Cities consists of five modules; each module is designed to complement and extend the previous one.

The **first module**, 'Inclusivity for Smarter City Development,' will unpack the people-centered approach to making cities smarter and more inclusive and, through several examples, demonstrate different ways of fostering smarter and inclusive city innovation.

The **second module**, 'Smarter Governance,' will take a deep dive into understanding smarter and inclusive city Governance, key stakeholders, drivers, and barriers to smarter and inclusive city development.

The **third module** will unpack 'Planning for smarter and inclusive cities' focusing on smarter and inclusive city strategies, particularities of planning a smarter and inclusive city or town, and typical thematic areas of action.

The **fourth module**, 'Smarter and Inclusive City Projects and Pilots,' will look at the mechanisms and approaches to developing locally adapted and people-centered smarter and inclusive city solutions and explain how to go from planning to action.

Finally, the **fifth module** will focus on implementing, adopting, monitoring, and assessing smarter and inclusive city initiatives.

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Module 1

Inclusivity for Smarter City Development

Module 1

Inclusivity for Smarter City Development

The first module of the deep-dive course on Smarter and Inclusive Cities takes a deeper look at inclusivity and unpacks the people-centered approach to smarter and inclusive city development.

Learning Objectives
On completion of the module, you will be able to:

• Recognize the need and potential of smarter and more inclusive cities

• Understand the importance of applying a systemic and people-centered approach to making cities smarter and more inclusive

• Understand the key approaches to fostering smarter and inclusive city development.

1.1 Why do we need a people-centered approach to making our cities smarter?

The 'Smart City' came with a promise that technology is the key to solving many problems cities face in our modern world. Over the years, this promise proved to be only partially true. Technologies have changed the way we live our lives and develop our cities. However, technology is only an enabler, not the key to better urban living. It creates opportunities for innovative city development, but to make our cities smarter, we need to use the technology smartly and inclusively to meet the needs of local communities, businesses, and citizens.

It is important to note that technology can sometimes act as a barrier, particularly for individuals with basic ICT skills. Women, on average, are less likely to possess advanced ICT skills. Therefore, adopting a gender-responsive approach and ensuring women's active participation in co-creating solutions is essential for fostering inclusivity and equity.

Why do smart cities sometimes fail?

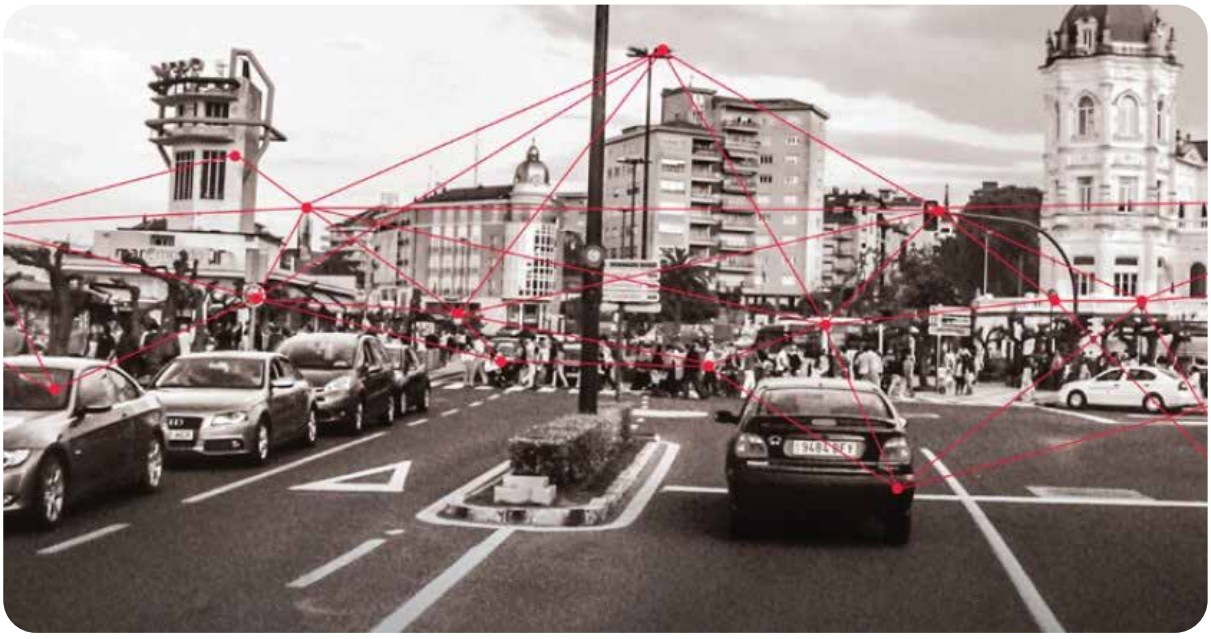
Starting as a technology-driven urban development process, it resulted in many smart city initiatives failing to deliver 'better' and 'smarter' cities as they were not aligned with the needs of locals and often overlooked citizen engagement. It is important to note that these needs vary based on gender, disability status, age, and their intersection. Frequently, women and people with disabilities are among those excluded from smart cities.

Some well-known cases of 'failed' smart cities include Songdo (South Korea) and Santander (Spain). Songdo was constructed from the ground up to be a sustainable, low-carbon, and high-tech utopia but failed to attract residents or create thriving urban communities. In its turn, Santander became famous for being the city with the highest number of sensors worldwide at the end of the 2000s. However, the city ran into various issues related to maintenance, network capacity, and data privacy.

These and other 'failed' smart city examples demonstrate that technological focus alone will not deliver the solutions for better urban living.

Read more about **Sondago here**

and **Santander here**



Santander.
Source: Governing.com

There is no one reason but an interplay of several problems, for example:

- Tech-driven, not problem driven
- **Disregard for local context and people's needs**
- **Lack of citizen engagement, social discrimination**
- Limited organisational capacity and lack of leadership
- Funding gaps and lack of multi-stakeholder partnerships

A collaborative approach to smart cities

In 2016, the European Innovation Partnership on Smart Cities and Communities launched a **Manifesto on Citizen Engagement and Inclusive Smart Cities**, an EU-level Policy outreach document. It declared a commitment to create and foster accessible urban services for citizens to improve the quality of life of **all citizens** and contribute to sustainable cities and a livable environment. The Manifesto also defined an essential element for successful outcomes of smart city projects: to **start from people by focusing on citizen needs, embracing citizen-centric design, and the search for an integral quality of life.**

We need smarter cities, not "smart cities"

The concept of "smart cities" has become too narrow, dominated by high-tech ambitions at the expense of the richness of urban life. Authentic smart cities embrace the complexities of urban living and prioritize human-centric outcomes over technological installations. They incorporate a range of innovations, from Singapore's advanced tech to Curitiba's transport system and China's ecological urban design. This broader vision for urban areas values the interplay between all sectors of society and is aligned with the Sustainable Development Goals, fostering cities that are not just technologically advanced but inclusive, sustainable, and resilient.

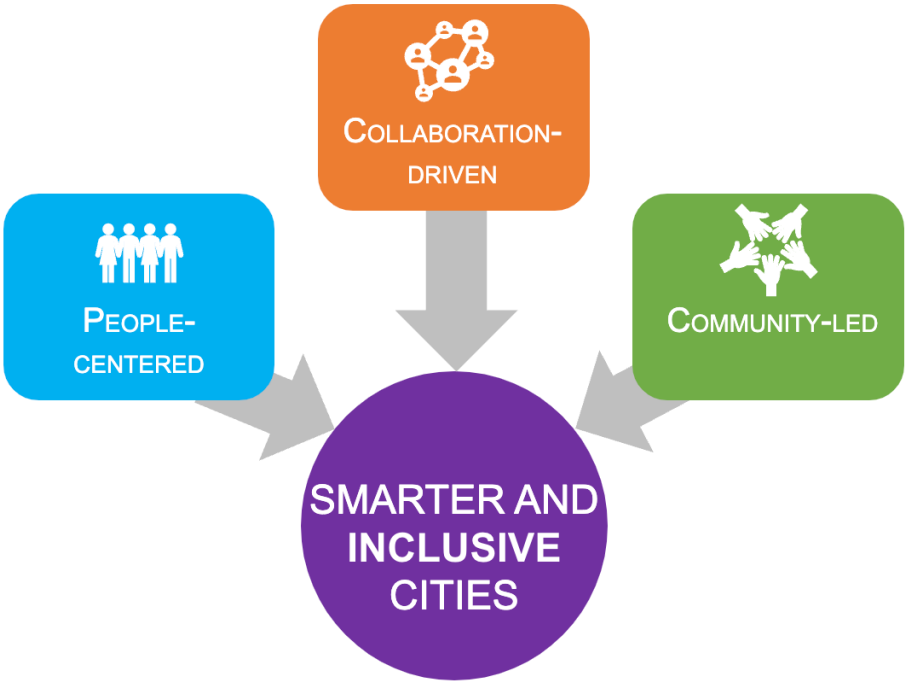
"Truly smart cities recognize the ambiguity of lives and livelihoods, and they are driven by outcomes beyond the implementation of 'solutions.'"

as defined by the International Labour Organization (ILO)

Read more in this UNDP blog on **"We need smarter cities not smart cities"**

Focusing on inclusivity for smarter city development

Smarter and inclusive cities are open and collaborative cities that belong to the people. They promote social and economic health and well-being of the whole urban community, protecting a city's cultural and human values and potential. Smarter and inclusive development relies on a people-centered approach to drive sustainable social and economic growth. In this sense, smartness and inclusivity can be defined as a **people-centered, collaboration-driven, and community-led approach** to urban development and transformation. It is crucial to keep in mind that people have different needs based on various conditions, and the barriers and challenges they face may vary accordingly. For instance, older women may have different needs and experience different barriers or challenges compared to younger women or older men.



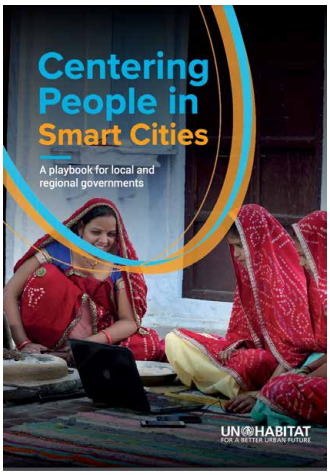
1.2 UN-Habitat People-centered approach

Putting people at the center of smarter and inclusive urban development requires a shift in the way we think and approach innovation in our cities and towns. For example, Amsterdam (Netherlands) has chosen a values-driven approach to innovation that is human-centered, open, transparent, and based on learning-by-doing. The focus on people is also central to the UN-Habitat's People-Centered Smart Cities flagship programme that aims to empower local governments to take a multi-stakeholder approach to digital transformation. It emphasizes inclusivity and human rights as a cornerstone for sustainable and prosperous city development.

A people-centered approach means creating not only cities for people but also with people. In the context of smarter and inclusive cities, a people-centered approach requires engaging deeply with the needs of all residents and urban stakeholders through meaningful community participation, bridging the digital divide, developing essential digital infrastructure and Governance, and building capacity through multi-stakeholder partnerships.
It also requires taking a systemic and strategic approach to digital transformation, understanding its potential, and ensuring that it aligns with the existing local, national, and global priorities, e.g., sustainable transport, affordable housing, or reduction of carbon emissions.

The people-centered approach suggested by UN-Habitat has five key dimensions defining a systemic way of making cities smarter and more inclusive. From empowering communities to securing and building our digital infrastructure collaboratively, we are going to unpack each dimension in more detail in the next sections of this course.

Read more about the UN-Habitat people-centered approach in the **"Center People in Smart Cities – A Playbook for local and regional governments"**



KEY DIMENSIONS

Community

Empowering people

Digital Equity

Ensuring access to technology for all

Infrastructure

Responsibly managing data & digital infrastructure

Cybersecurity

Protecting data, systems, infrastructure, and privacy

Capacity

Building multi-stakeholder capacity

1.3 Community: Empowering people

A key component of empowering people is citizen engagement.

In traditional smart city models, local governments have either failed to meaningfully engage residents (especially marginalized groups such as ethnic minorities, people with disabilities, and those living in poorer communities), outsourced community engagement to the private sector, or placed too much emphasis on 'e-participation' [5].

E-participation uses digital tools for participatory processes in urban planning, policy-making and decision-making. It employs a wide range of digital solutions designed for everyday use (e.g., websites and social media) or specifically for citizen engagement in urban development (e.g., map-based idea collection platforms).

Although e-participation has become a popular format for citizen engagement, allowing engagement to a larger number of residents in a seemingly convenient and quick way, it is often subjected to the same challenges as more traditional engagement formats, e.g., ensuring representativeness and inclusivity [6].

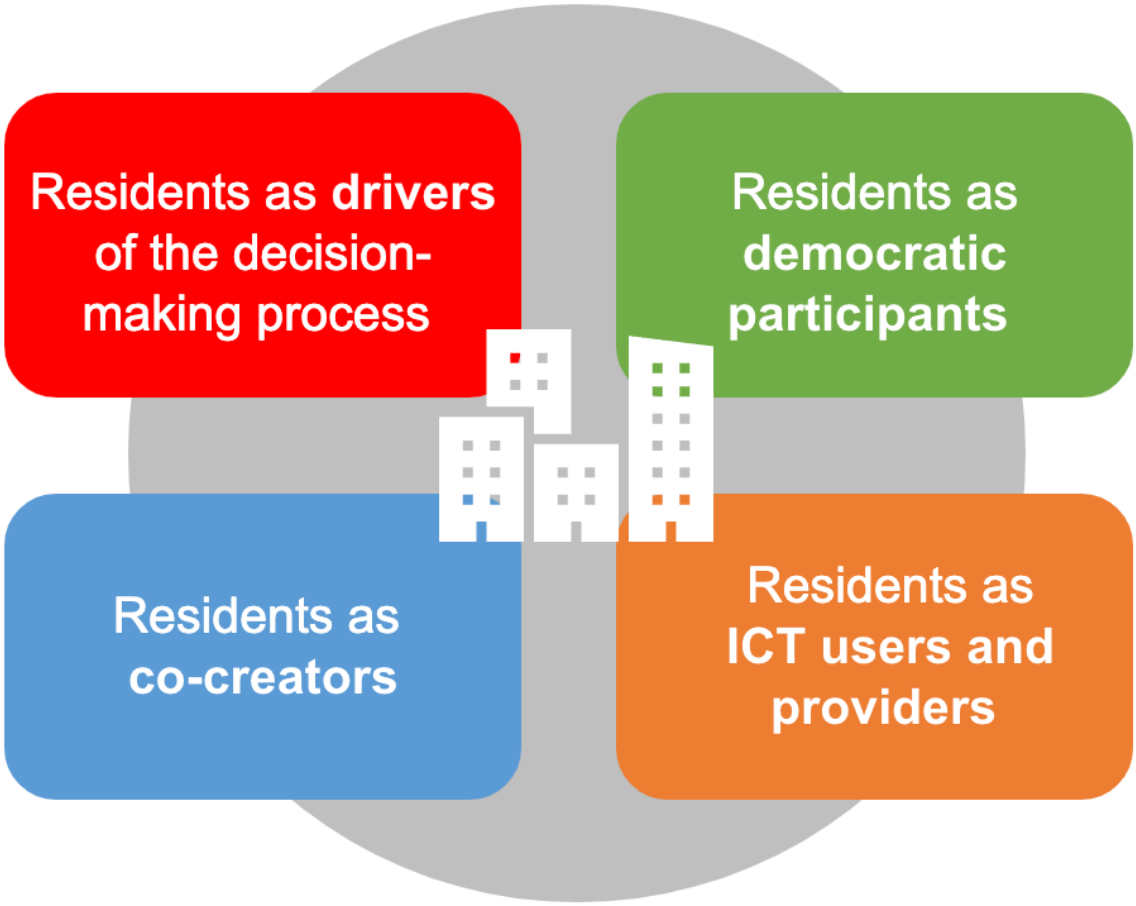
Smarter and inclusive city development ensures that citizen engagement provides opportunities for the participation of all social groups at all development stages, empowering people to take on different roles throughout the process [5]:

- Residents as **drivers of the decision-making process** by actively setting budgets, setting strategic goals, and defining the use of new technologies, e.g., through participatory budgeting or crowdsourcing.

- Residents as **democratic participants** are included in the decision-making process, influencing project goals and desired outcomes and providing feedback on the use of technologies, e.g., through e-participation platforms or apps and different workshops.

- Residents as **co-creators** helping local governments build technology or infrastructure, create new uses for data and ICTs, or co-develop policies and strategy, e.g., through hackathons or living labs.

- Residents as ICT **users** and providers - participating and using online platforms and digital infrastructure.



Community engagement goes beyond technology. It starts with good communication aiming to create meaningful relationships with residents in an environment where they will feel valued and safe. Safety, for instance, is deeply gendered, as the design of lighting in the city can play a role in preventing women from gender-based violence. The input of residents and gender experts should be collected in different areas, for example, in the renovation of public space, deciding if a street should be car-free, etc. You can read more on Citizen Participation in Module 2.

1.4 Inspirational case study: Rotterdam, the Netherlands

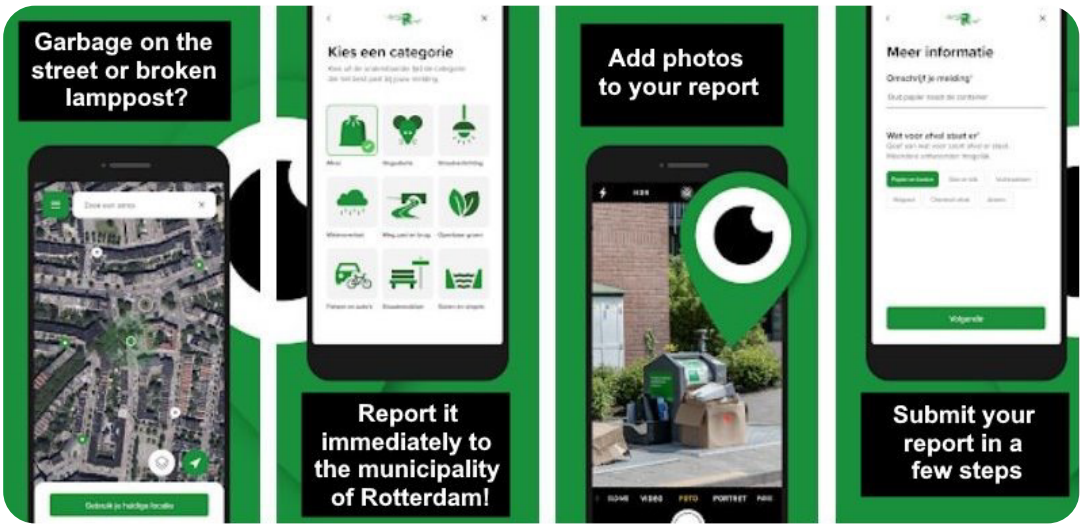
Upkeep of public spaces is a challenge in many cities and towns. Municipalities often rely on citizens to report everyday issues that require the attention of different municipal services. In Rotterdam, citizens had to navigate multiple communication channels to report issues, e.g., fill out a web form or call municipal services. It caused confusion and frustration. Consequently, the city decided to develop a user-friendly solution to report problems in public spaces with and for its citizens: a **Meld'R app**.

In developing the Meld'R app, the city of Rotterdam undertook user research and engagement. Applying Design Thinking methods, the city conducted in-depth interviews and focus groups and underwent thorough app testing with users. It has resulted in a user-friendly solution based on digital inclusiveness and accessibility.

Meld'R app has changed how people report problems in public spaces. 70% of all reports are made through the app. This reduced service costs by €183,656 in the first year alone and diminished the administrative burden for both citizens and civil servants.

Inspired by the positive outcome of the project, the City of Rotterdam plans to continue improving its services in a user-centric way. The lessons learned from the Meld'R project will be applied to the entire service chain of the city to bring about other improvements in the service provision.

Read more about **Rotterdam's experience here**

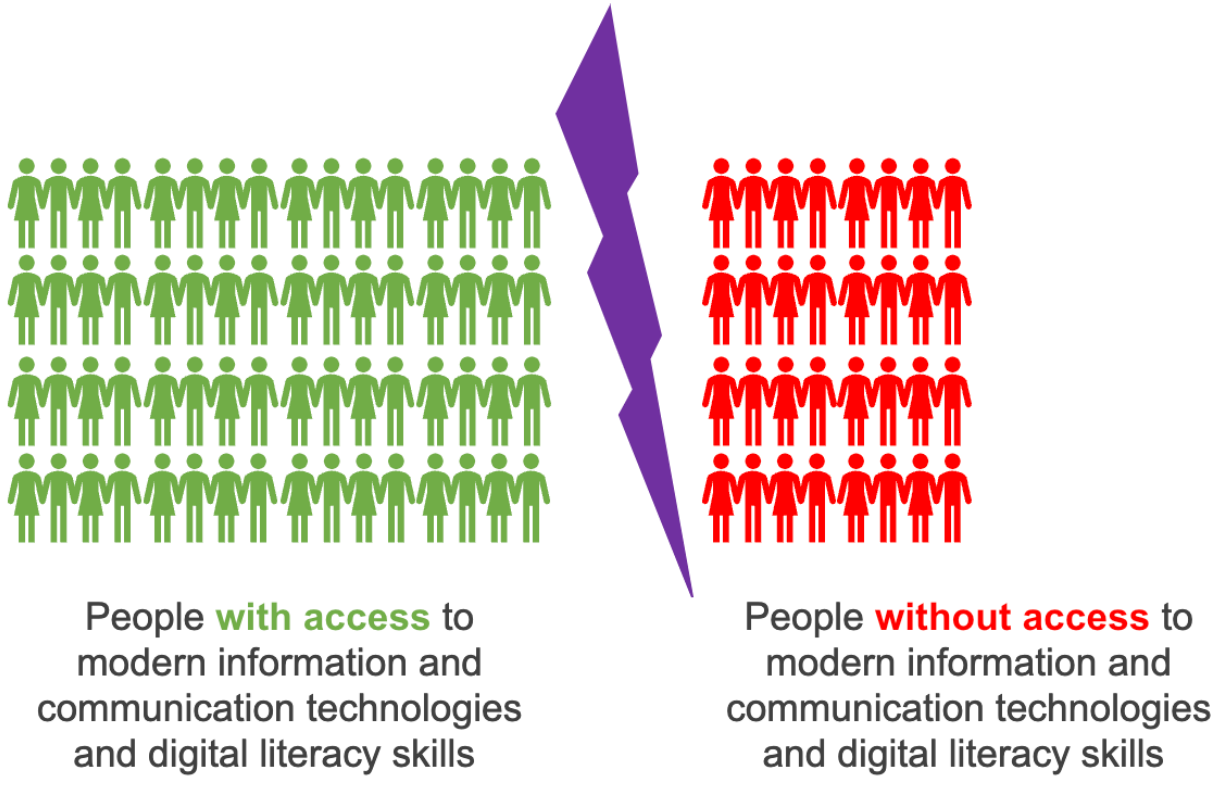


Co-creating Meld'R app with and for Rotterdam citizens to report various issues in public spaces

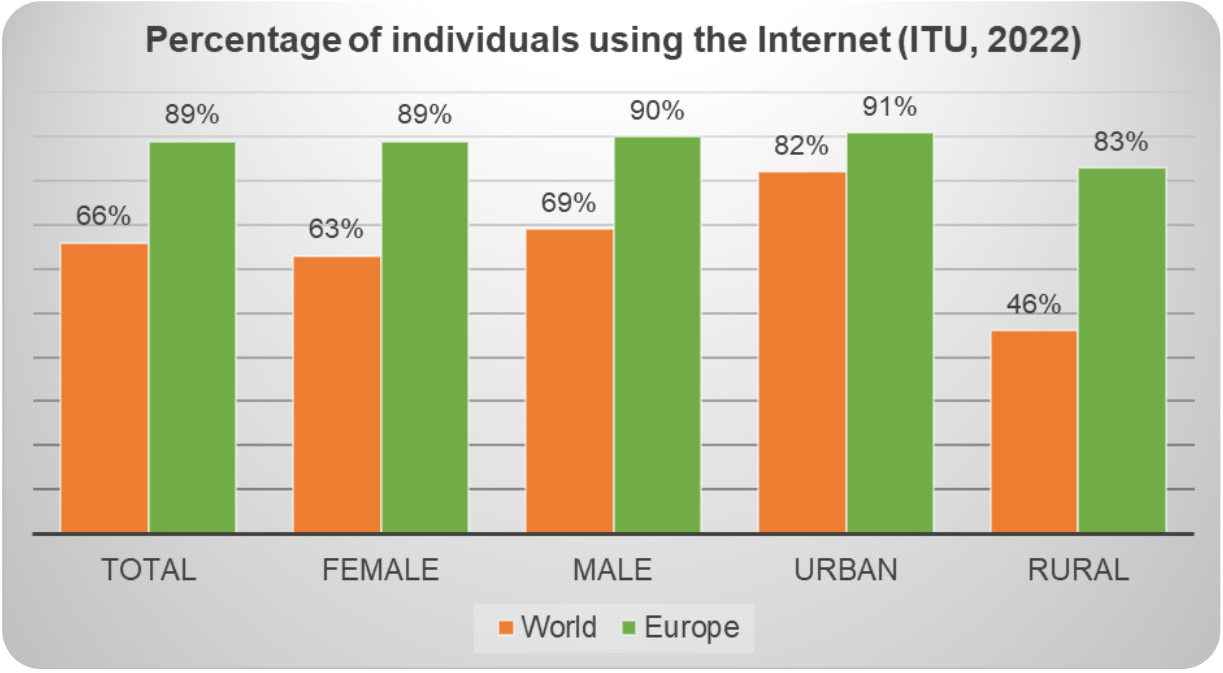
1.5 Digital equity: Ensuring access to technology for all

Access to the Internet, digital devices, and services is no longer a luxury but a part of everyday life in modern society. Nevertheless, not everyone has equal access to digital infrastructure or sufficient skills to use it. Therefore, when planning to make cities and towns smarter and more inclusive, municipalities must consider the digital divide

The digital divide is the gap between individuals with access to modern information and communication technologies and digital literacy skills and those without [7].

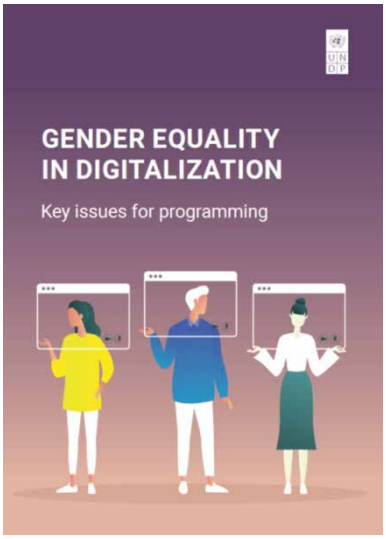


Data on Internet usage globally shows that 66% of the world's population uses the Internet. In Europe, this percentage is as high as 89%, demonstrating regional differences [8].



Causes of the digital divide

The digital divide is primarily driven by gender norms and cultural stereotypes, affordability issues, and a lack of digital literacy and skills among women. External factors such as regulations, infrastructure, and trust in digital services, along with gender bias in design and access to services, further exacerbate the divide. Additionally, women face limited employment and entrepreneurship opportunities in the digital sector and are more vulnerable to cyberviolence, highlighting the need for targeted interventions to bridge this gap.



Read more about **Gender Equality in Digitalisation**

Many factors impact Internet usage across countries and regions. For example [8]:

• On a global scale, 69% of men use the Internet, compared with 63% of women, demonstrating a still existent gender divide.

• People living in cities and towns have a considerably higher percentage of individuals using the Internet. This difference is evident not only globally but also in Europe.

• Worldwide, 75% of young people aged between 15 and 24 used the Internet in 2022. It is 10 percentage points more than among the rest of the population (65%), demonstrating a generational divide.

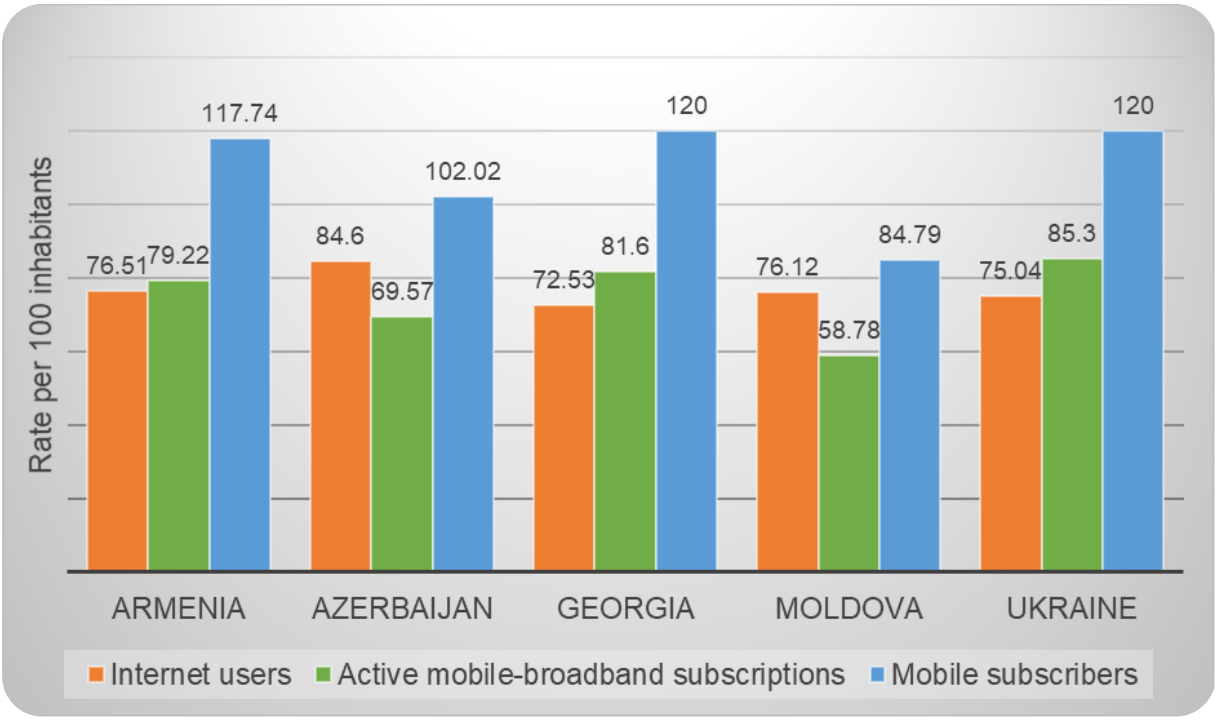
• Many of these differences are more pronounced in lower-income or lower-middle-income societies, emphasizing the socioeconomic divide.

• Furthermore, factors like motivation and social acceptability of going online or a basic level of digital skills can impact people's ability to use digital infrastructure.

If looking at the Eastern Partnership countries, the UN E-Government Knowledgebase provides insights into telecommunication infrastructure and its usage for each country. [9].

It suggests that the percentage of Internet users in the Eastern Partnership countries is higher than the world's average but lower than the European Union. Consequently, it is important to understand further and explore how this digital divide manifests in each city or region, its root causes, and how the municipality can support those who currently don't have access to digital infrastructure or the skills to use it.

Many cities worldwide have launched support programmes and campaigns to tackle the digital divide. From providing free wireless Internet access in public spaces to delivering skills training and designing digital public services that are accessible and easy to use by everyone, there are plenty cities and towns can do to ensure that no one is left behind in our increasingly digitalized world.



Economy name	Latest year	All Individuals	Gender		Urban			Rural	
			Male	Female	Total	Male	Female	Total	Male	Female
Armenia	2022	77.0	74.4	79.3	79.5	77.8	80.9	73.3	69.9	76.7
Azerbaijan	2021	86.0	88.4	83.6	94.3	95.0	93.7	76.5	81.0	71.9
Georgia	2022	78.7	78.8	78.6	85.2	85.8	84.7	68.7	69.4	68.1
Ukraine	2021	79.2	82.0	76.8	83.4	86.2	81.0	70.9	73.8	68.3

Source: ITU 2024. Individuals using the Internet (from any location), by gender and urban/rural location (%).

1.7 Digital equity: Tackling the data divide

Tackling the digital divide requires an intentional and multidimensional strategy. Municipalities should think about supporting specific social groups affected by the digital divide or addressing particular challenges, e.g., access to devices or support with digital skills training.

Watch this video to learn more about
"Why inclusive digital transformation matters"

Many cities worldwide have developed different programmes and support mechanisms for their citizens.

Greater Manchester (UK): Digital Inclusion Agenda

Launched in October 2020, the Greater Manchester Digital Inclusion Agenda has a bold ambition to make Greater Manchester a 100% digitally enabled city region. Greater Manchester set out to become one of the first city-regions in the world to equip all under-25s, over-75s, and disabled people with the skills, connectivity, and technology to get online. It meant bringing together different stakeholders (businesses, local authorities, schools, voluntary and charitable organizations) to devise targeted support mechanisms [10].

These include:
(1) support with connectivity, e.g., social tariffs for households struggling to afford broadband or phone services;
(2) support with devices, e.g., device loaning or subsidized device schemes; and
(3) support with digital skills, e.g., digital skills training and resources [11].

Watch the video **Greater Manchester Digital Inclusion film - why digital inclusion matters** to find out more

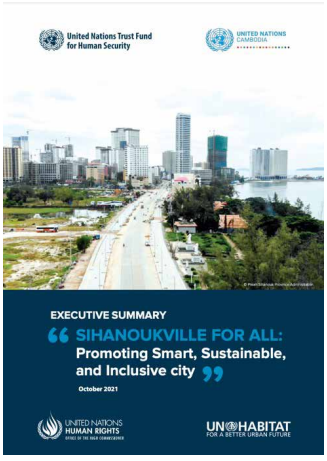
More information on how **Greater Manchester is addressing its digital divide** can be found here

Sihanoukville (Cambodia): Promoting a Smart, Sustainable, and Inclusive City

Sihanoukville has developed its Sustainable, Inclusive and Smart City Concept that foresees tackling a wide range of urban challenges, including environmental, economic, and social insecurities. As part of the Concept, Sihanoukville has also proposed two initiatives aimed at bridging the digital divide among different social groups [12]:

1. Accessible free internet zones in strategic urban and rural areas.
This initiative is especially addressed to poor and marginalized people. It foresees the identification of the city's most popular places for free WIFI Hotspots. As one of the top priority initiatives to enable equal access to the Internet, it demonstrates Sihanoukville's commitment to creating favorable pre-conditions for accessing digital services and information.

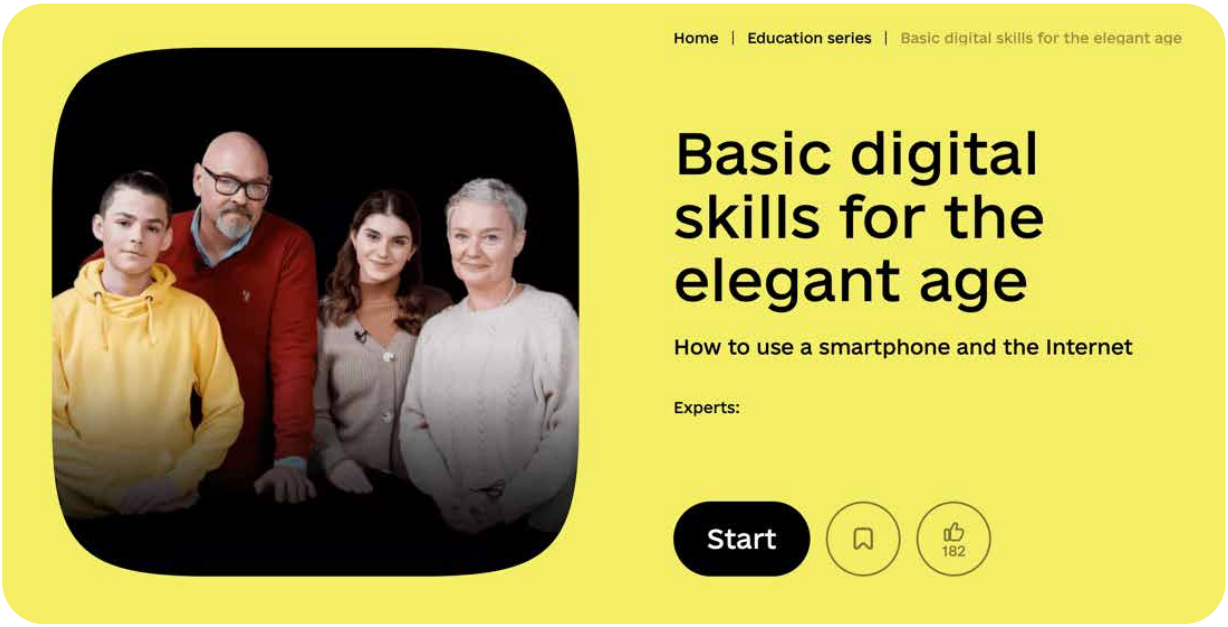
2. Permanent programme of computer/technology literacy for citizens through the "Digital City Ambassadors."
A dedicated programme for local communities will be launched to provide digital, technological education in deprived urban and rural areas through the "Digital City Ambassadors" programme. It foresees enrolling young people to support the capacity-building education programme for all citizens. A specific focus for the Ambassadors will be on guiding people to benefit from the E-governance and E-participation platform, contributing to crowdsourced initiatives, and getting information on health, the economy, food production, etc.



Read more about **Sihanoukville's Sustainable, Inclusive and Smart City Concept** here

Ukraine - Basic digital skills for the elegant age'

Some countries across the Eastern Partnership already have similar initiatives in place on the national level. For example, the Ministry of Digital Transformation of Ukraine and the UNDP have launched a training programme, **'Basic digital skills for the elegant age',** to support Ukraine's older population.



Read more about the initiative **here**

Do's and Don'ts

Besides supporting citizens in overcoming the digital divide, municipalities should also take a proactive approach to digitalizing their public services. With the increasing demand and ambition for going digital, municipalities should be intentional about addressing the digital divide at the early stages of new service development. The guiding principle should be to make public services accessible and easy to use for all.

The UNDP provides a list of Do's and Don'ts and Digital Guide when it comes to building inclusive digital services. Municipalities can also use the available tools to better understand users' profiles and identify challenges contributing to their digital exclusion or develop a targeted digital divide mitigation strategy when developing new digital services [13].

The UNDP list of Do's and Don'ts

Bridge the Digital Divide Identification Canvas

Bridge the Digital Divide Mitigation Canvas.

UNDP Digital Guide on Governance and State Capabilities for Gender Equality

Another aspect important to consider in the digitalization of public services is the transition and the necessary support for those who are not familiar with technologies. For instance, an option could be to consider hybrid service delivery and having centers where citizens can get assistance using digital tools and/or can get in-person services. This action would help in the transition towards full digitalization.

1.8 Reflection: Digital divide in your city or town

Based on what you've learned about the digital divide, reflect on the challenges and possible solutions related to the digital divide in your city or town. Try answering one or all the following questions:

- What social groups or urban areas lack access to modern information and communication technologies?
- What are the causes of this digital divide?
- What could your city or town do to help your citizens overcome these challenges?

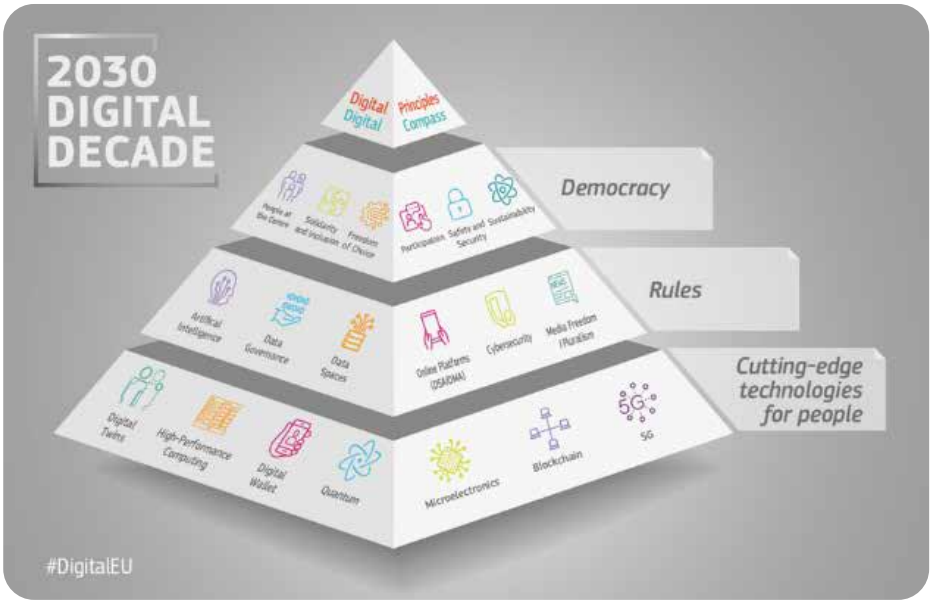
1.9 Infrastructure: Responsibly managing data & digital public infrastructure

Developing smarter and inclusive cities requires digital public infrastructure. We already discussed the need to ensure equal access to the Internet when talking about the digital divide, but that is only one component of digital infrastructure. Digital infrastructure is a much broader concept encompassing **physical and software-based infrastructure that enables the delivery of digital goods, products, and services** [14].

It incorporates hardware (physical infrastructure, e.g., telecommunication networks and sensors), software (programming that supports digital public services, e.g., digital identity and digital payments), and policy frameworks (e.g., data Governance and digital service standards). Well-developed and secure digital infrastructure is a critical enabler of digital transformation and improvements in public service delivery [15].

Many stakeholders are involved in developing and improving digital infrastructure, including different actors in the public and private sectors. For example, public actors typically develop policy frameworks on the national or international level, while telecommunication companies often drive expansion and improvements of physical infrastructure.

The European Commission has set ambitious digital targets for 2030, e.g., covering all European households with a Gigabit network and all populated areas by 5G or ensuring all citizens have access to a digital ID. These objectives cannot be achieved by public service providers alone. It requires collaboration among public and private market players involving academia and civil society to accelerate innovation.



Read more here about **Europe's Digital Decade**

EU digital targets for 2030

Source: Europe's Digital Decade.

It is not just EU countries making progress and setting ambitious goals for digital infrastructure. The Eastern Partnership countries are following suit. For example, the Republic of Moldova has advanced the use of remote identification of users by improving legislation and launching the development of technological platforms to support the development of digital public services. Similarly, Armenia is implementing a national identification gateway system, 'EsEm', that will be used for online public service delivery systems from 2024. It opens new possibilities also for cities to capitalize on these innovations for service delivery.

Read more here about
EU4Digital in Moldova

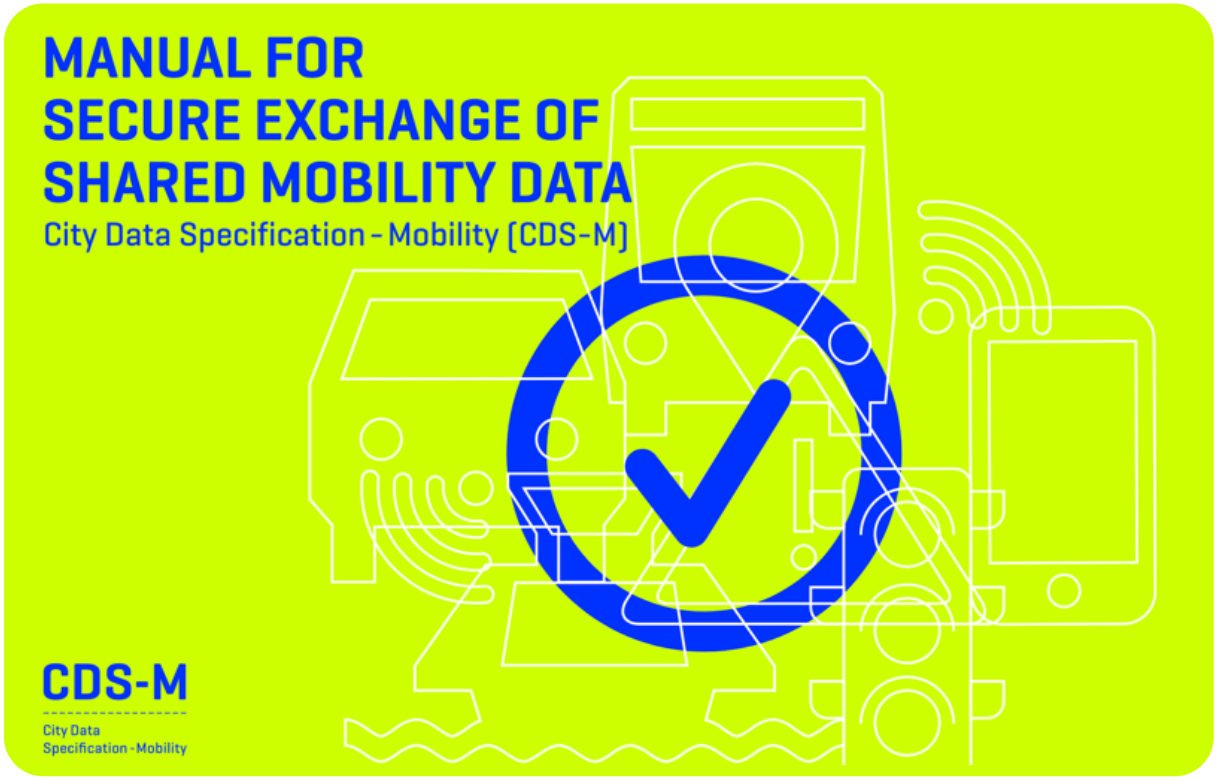
Read more here about
EU4Digital in Armenia

What can cities do to improve digital infrastructure?

Despite digital infrastructure being primarily dealt with on the international or national level, cities are uniquely positioned to advocate for their citizens' rights and needs and to build inclusive digital public infrastructure. For example, cities can collaborate with telecommunication service providers and incentivize them to expand and improve their services, especially in those urban areas that have been overlooked. Additionally, it is crucial to develop gender responsive strategies at national and local level.

Read more about **Digital Public Infrastructure and how to bridge the Gender Gap** here

Some cities have also tackled data Governance and privacy. For example, Amsterdam, Netherlands, raised concerns about shared mobility data and data privacy of their citizens. The city took the lead in developing a new data-sharing manual to address the lack of clear standards for processing information safely. Amsterdam's City Data Standard for Mobility (CDS-M) allows cities to use and research mobility data while respecting users' privacy rights. It includes a comprehensive roadmap that can be used as a footprint in other municipalities.



Source: CDS-M

You can access the **manual** here

Read more about **Amsterdam's approach to digital infrastructure** here

Responsible and safe data management is important for all public domains and services. The UNDP provides eight data Governance principles that can be used in the absence of comprehensive national data Governance standards. These are:

1. Plan for reusability and interoperability
Maximize the value of our data by ensuring that it is usable in multiple domains. Make use of open standards and machine-readable formats in order to improve interoperability.

2. Empower people to work with data
Provide people with the technology and data literacy skills to be able to effectively work with and understand data. Support governments, local communities and civil society partners to strengthen data and statistical capacities.

3. Safeguard personal data
Embed 'privacy by design' into all data practices. Obtain informed consent and ensure that data are anonymized before publishing.

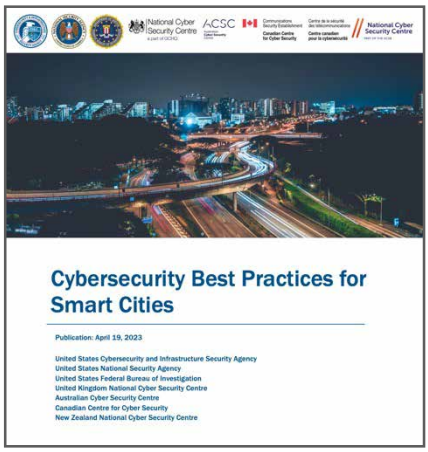
4. Uphold the highest ethical standards
Anchor data practices in the United Nations Charter and international human rights frameworks. Ensure that data processes and partnerships serve the public good.

5. Manage data responsibly
Practice effective data stewardship and Governance to ensure sound data quality, security and accountability in accordance with relevant institutional policies and regulations.

6. Expand frontiers of data
Explore emerging practices and innovative technologies to increase data availability and expand coverage of under-represented groups through data collection and disaggregation.

7. Make data open by default
Make data available as widely as possible. No 'data hoarding'.

8. Be aware of data limitations
Assess gaps, risks and bias in the use of data. Actively question blind spots and potential negative implications of data use.



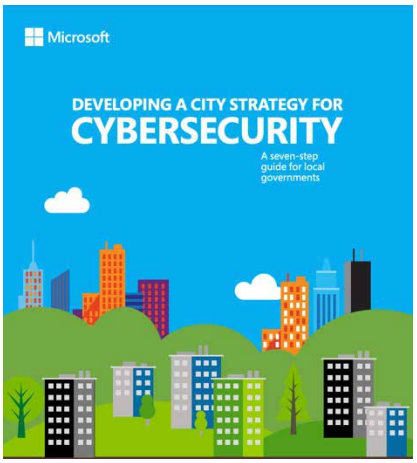
Source: UNDP Data Futures Exchange

Read more here about the **UNDP Data Principles** as well as access checklists and guides.

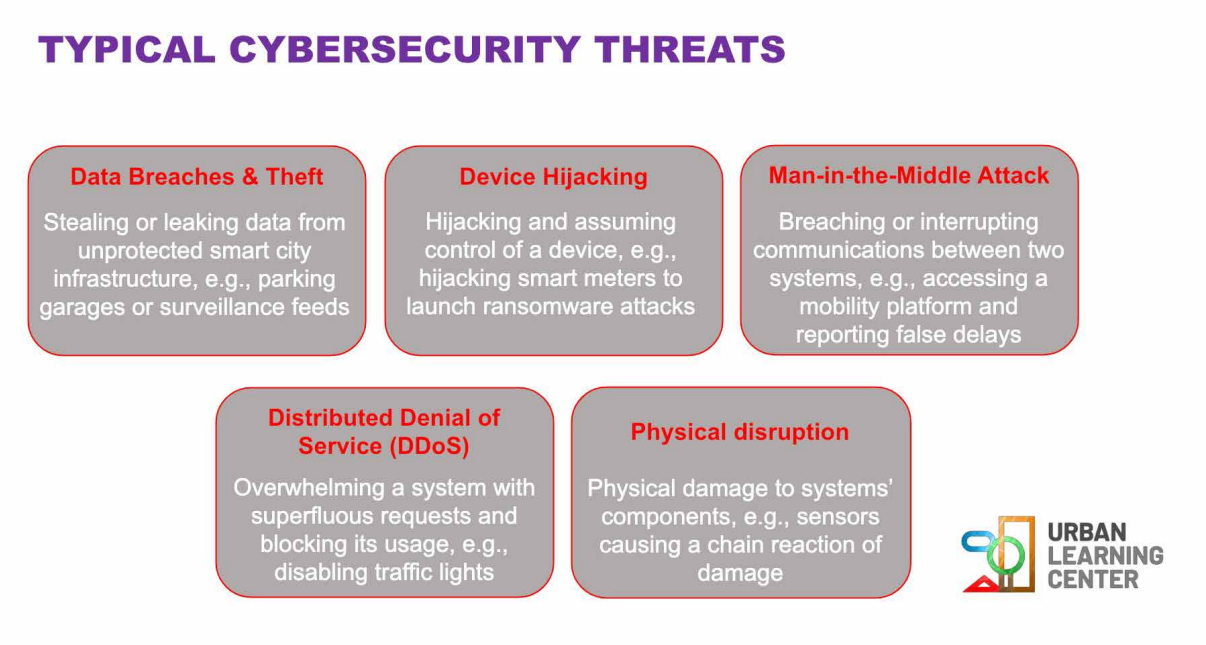
1.10 Cybersecurity: Protecting data, systems, infrastructure, and privacy

Smarter and inclusive cities are complex ecosystems where people, physical systems, and digital systems interact in various ways. Every second, large amounts of data and information are transmitted among different systems and users to make city services more efficient and the lives of locals more convenient. However, it also creates new cybersecurity risks and threats, potentially leading to disruption of essential public services, data and financial loss.

According to the European Union Agency for Cybersecurity, 24% of cybersecurity incidents reported between July 2021 and June 2022 were directed at public administration and the governmental sector [16]. It shows how widespread and persistent cyberattacks are in our increasingly digitalized world and how important cybersecurity is for smarter city development. Consequently, municipal leaders, urban planners, and other key stakeholders should make cybersecurity principles and measures an integral part of smarter city Governance, design, and operations [17].



Read more here about **Cybersecurity best practices for smart cities**



Ensuring cybersecurity is a complex challenge; therefore, the solutions also require complex and multidimensional approaches. From raising awareness about cybersecurity risks and threats among citizens to implementing ICT security measures, there is a broad range of precautions and actions national and local governments can take to minimize cybersecurity risks. For example, Microsoft has developed a **seven-step guide for local governments** on developing a city strategy for cybersecurity. More recently, cybersecurity authorities of Australia, Canada, New Zealand, the U.S., and UK have released a document on **Cybersecurity Best Practices for Smart Cities**. These guidelines provide both strategic and practical solutions for tackling cyber risks.

Read more about the seven-step **Microsoft Guide on Developing a city strategy for cybersecurity**

1.11 Reflection: Digital infrastructure & cybersecurity

Improving digital infrastructure and tackling cybersecurity risks are challenges faced by countries and cities worldwide. Therefore, sharing good and bad practices is essential for joint learning. Share an initiative or policy related to:

- Developing and improving digital infrastructure in your country or city,
- Data Governance or data protection,
- Cybersecurity strategy or measures, or
- Awareness raising about cybersecurity risks.

Reflect on how this initiative or policy helps or inspires municipalities in your country to address emerging challenges related to digital infrastructure or cybersecurity.

1.12 Digital equity: Tackling the data divide

Due to the interdisciplinary nature of smarter and inclusive city development, municipalities should take a critical look at the current work practices and their internal and external organizational capacities. It requires leaving behind siloed work practices and embracing collaboration-driven and flexible approaches.

A single organization cannot develop and implement smarter and inclusive city projects or initiatives on their own. It requires building new partnerships and involving stakeholders from different sectors and domains.

Although building external capacities through collaborations is important, it is equally essential that cities invest in the capacity building of city staff.

The Skills4Cities project focused specifically on identifying the competencies needed within local governments for smarter city development. They defined 40 competencies (knowledge, skills, and abilities), including **transversal competencies** (e.g., creative thinking, leadership and conflict management, teamwork, and public communication), **technological competencies** (e.g., data analytics, cybersecurity, and Internet of Things), and **domain-specific competencies** (e.g., transport and mobility, energy, public safety) [20].

Read more here about the **"Smart Skills for Smarter Cities – Toolkit for Smart City Competencies Framework"**

It is important to emphasize that one person is not expected to have all the necessary competencies for smarter and inclusive city development. Municipalities should strive to build diverse teams with complementary competencies working across departments and sectors.

Building internal capacity requires a strategic approach and leadership commitment at the top levels. Municipalities should strive to implement several approaches for internal capacity-building, e.g., training and upskilling the existing workers, attracting and retaining digital talent, providing opportunities for participatory leadership, and creating spaces for collaborative problem-solving and experimentation [21].

Several cities worldwide have already implemented programmes for staff training to improve their digital literacy, e.g., **Montevideo (Uruguay) and Baltimore (U.S.)**. Both cities are working toward building core data skills for staff at all levels by creating training opportunities. For example, Baltimore has launched **"Baltimore Data Academy"**, which provides online courses on data literacy. The courses allow city staff to acquire and sharpen their data skills regardless of their current job position.

Read more about **Montevideo and Baltimore** here

Read more about the **Baltimore Data Academy** here

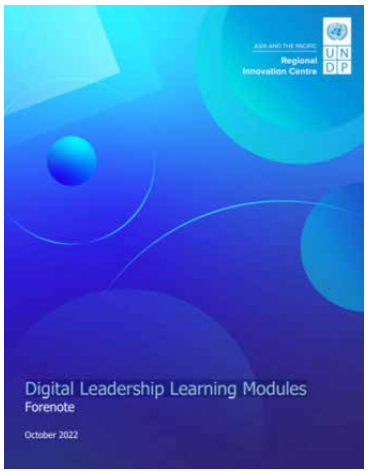
The UNDP also provides training materials for civil servants, e.g., **UNDP Digital Leadership Learning Modules**

Finally, it is important to emphasize that smarter and inclusive city development is only as successful as the people involved. Therefore, facilitating changes in the organizational culture and investing in capacity building is crucial for a smarter and more inclusive urban future.

1.13 Smart City Index

What does it mean if your city is "smart"?
Watch the video below by the Institute for Management Development IMD to learn more about **what is considered a smart city**:

There are many indexes and rankings on smart cities, for instance, the **IMD Smart City Index** and the **IESE Cities in Motion Index.**



Read more about **IMD Smart City Index**

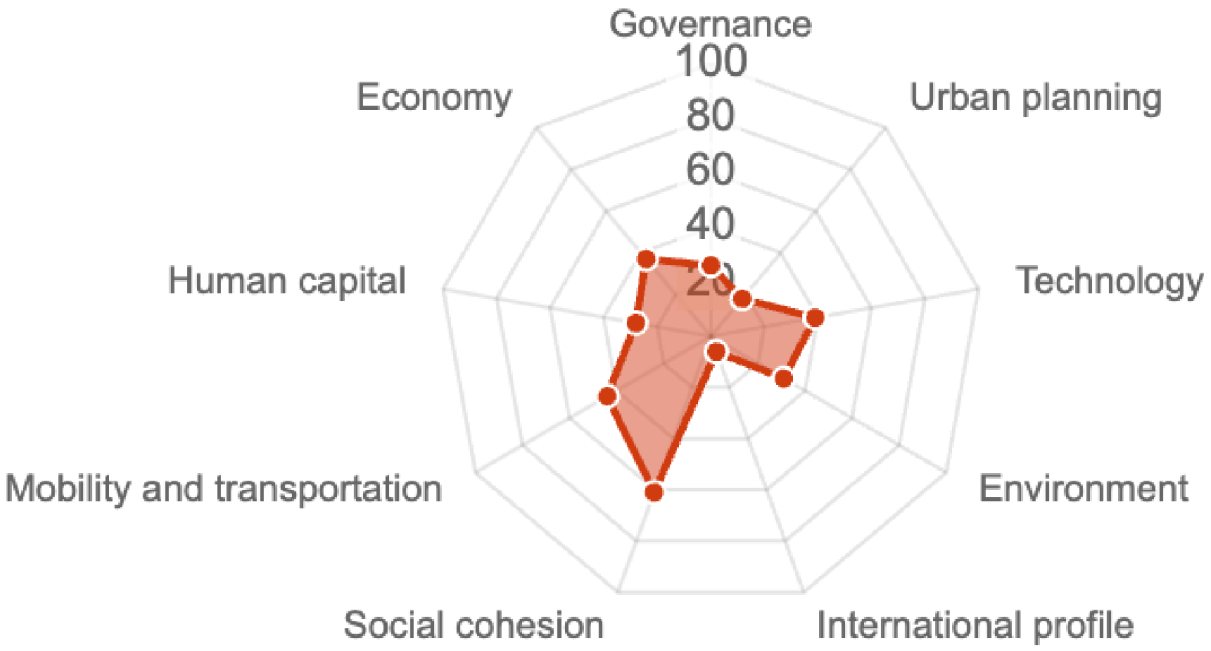
Read more about **IESE Cities in Motion Index**

The International Institute for Management Development (IMD) has been producing the Smart City Index since 2019, offering a balanced focus on economic and technological aspects of smart cities on the one hand, and "humane dimensions" of smart cities (quality of life, environment, inclusiveness) on the other. The IMD Smart City Index 2023 assesses the perceptions of residents on issues related to structures and technology under five key areas: health and safety, mobility, activities, opportunities, and governance.

RANKING

140 ● Baku (Azerbaijan)

Performance coverage area: 10,7%



Source: Cities in Motion, IESE – Ranking of Baku 2024

In 2023, 141 cities were measured, and the revamped 2023 edition of the IMD Smart City Index (SCI) has seen Asian and European economies dominate the top 20. Taking the top three places were Zurich (1st), Oslo (2nd) and Canberra (3rd) [22].

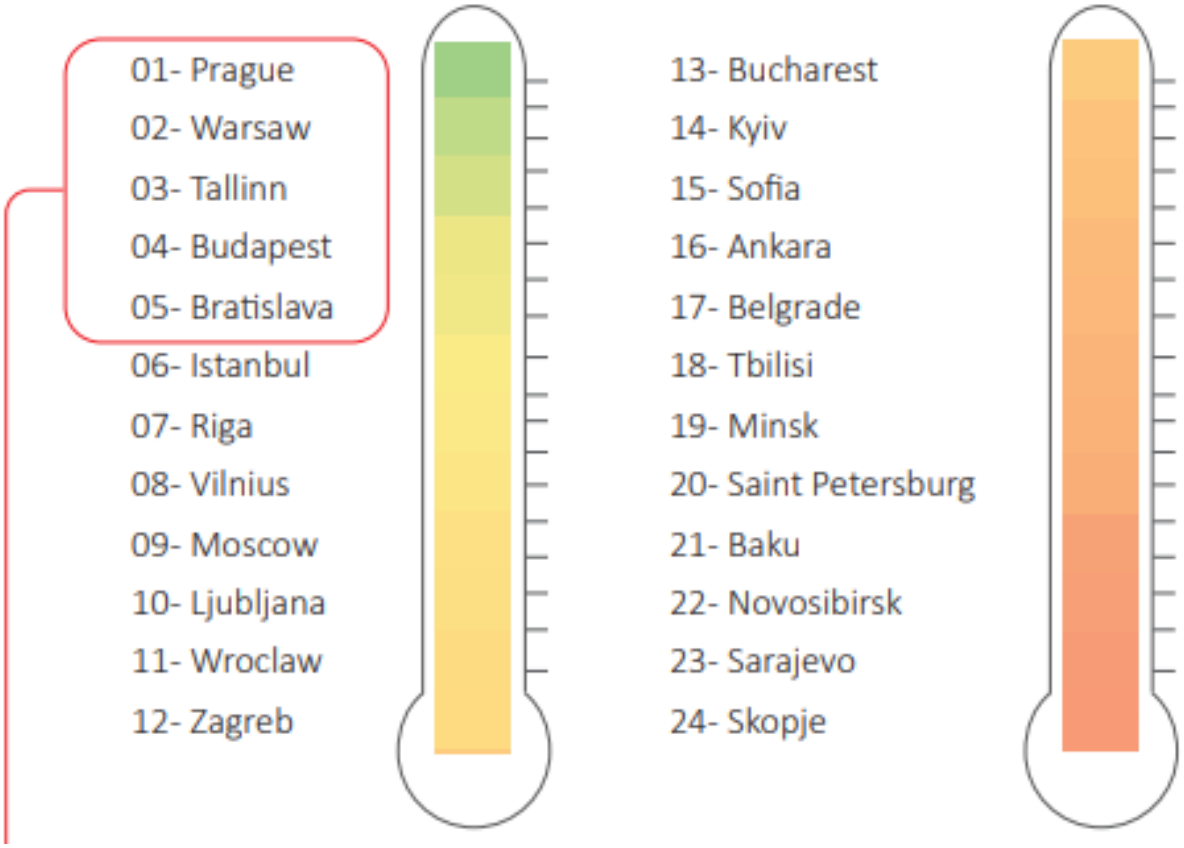
Who is in the top 20 of the IMD Smart City Index 2023?

IMD Smart City Index 2023 – Ranking	City
1	Zurich, Switzerland
2	Oslo, Norway
3	Canberra, Australia
4	Copenhagen, Denmark
5	Lausanne, Switzerland
6	London, UK
7	Singapore, Singapore
8	Helsinki, Finland
9	Geneva, Switzerland
10	Stockholm, Sweden
11	Hamburg, Germany
12	Beijing, China
13	Abu Dhabi, United Arab Emirates
14	Prague, Czech Rep.
15	Amsterdam, Netherlands
16	Seoul, Korea South
17	Dubai, United Arab Emirates
18	Sydney, Australia
19	Hong Kong, Hong Kong
20	Munich, Germany

Source: IMD Smart City Index Report 2023.

The IESE Cities in Motion Index analyses the performance of cities in nine key dimensions: human capital, social cohesion, economy, governance, environment, mobility and transportation, urban planning, international profile and technology [23].

Eastern Europe Top ranked in the IESE Cities in Motion Index 2022



Source: IESE Business School – IESE Cities in Motion Index 2022

Key Takeaways from the IESE Cities in Motion and IMD Smart City Index:
• The results cannot be interpreted in isolation, they must be understood in the current context [23].

• The importance of human capital: The index shows that cities with high levels of human capital appear to be more resilient to crises. This observation should be reflected in the priorities of city managers, who will have to focus on long-term education policies [23].

• The 2023 rankings reflect a growing interest and higher levels of concern about the quality of life that residents are expecting to enjoy in their respective cities [22].

• Many city officials are now routinely using a variety of different expressions in lieu of 'smart cities': 'open and innovative cities',' inclusive and diverse cities', 'sustainable cities' and 'citizen-centric cities' [22].

• Cities that are able to bring together different social actors – the public sector, private companies, civic organizations and academic institutions – will be better positioned to achieve success in a shorter time frame [23].

Inclusion and diversity are emerging as key benchmarks for success. An increasing number of cities are deploying new efforts to encourage diversity and inclusion as part of their smart strategies, variously linked to strategies to attract or retain talent or to pre-existing conditions [22].

1.14 Key Messages

In this module, we have discussed five key dimensions for smarter and inclusive city development: citizen engagement and empowerment, digital inclusion, digital infrastructure and cybersecurity, and internal and external capacity building of municipalities. All these aspects have demonstrated the complexity of challenges that cities must tackle to become smarter and more inclusive. However, the overarching principle has been to focus on people's needs, facilitate the inclusion of all citizens, and respect human rights in this increasingly digitalized world. At the end of this module, we want to leave you with three key messages:

• **Smarter and inclusive cities engage people of different genders, ages, and disability statuses at all stages of urban development.** This will tailor the city better to various needs and address different barriers and challenges, as well as enable citizens to take on different roles in working with the municipality for a joint better future.

• **Well-developed and secure digital infrastructure and systems are deployed, considering citizens' needs and rights.** They should provide accessible and secure digital spaces and services for all, respecting individual privacy and freedom.

• **Smarter and inclusive city development is only as successful as the people involved.** Therefore, municipalities should strive to enable capacity building of their staff and embrace collaborative and flexible work practices.

1.15 Test your learning

Read the given statements. Please indicate whether the statement is True or False according to the information discussed in this Module.

	True	False
1. Citizen engagement is crucial for people-centered smarter and inclusive cities and is best conducted fully online.		
2. The main reason for the digital divide is the lack of access to the Internet, which can be solved by providing free Wi-Fi.		
3. Developing digital infrastructure requires collaboration among the public, private, civic, and academic sectors.		
4. Cybersecurity is important for ensuring the safety of digital systems and services at all costs, with less consideration for human rights.		
5. Multi-stakeholder partnerships and leadership are instrumental in making smarter and inclusive city projects a success.		

Correct answers can be found at the end of this learning document.

Optional: If you want to challenge yourself more, try to rewrite the False statements in a way that would make them True for people-centered smart cities

1.16 Individual reflection

• What are you currently doing to increase your own digital literacy in your professional or personal life?

• Based on what you saw in this module, what are two concrete things you can do yourself or suggest to your leadership at your municipality to get 'smarter', more inclusive and digitally-fit?

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Module 2

Smarter Governance

Module 2

Smarter Governance

This Module is focused on Smarter Governance, an important element for developing smarter and inclusive cities. The module aims to provide answers to the following questions:

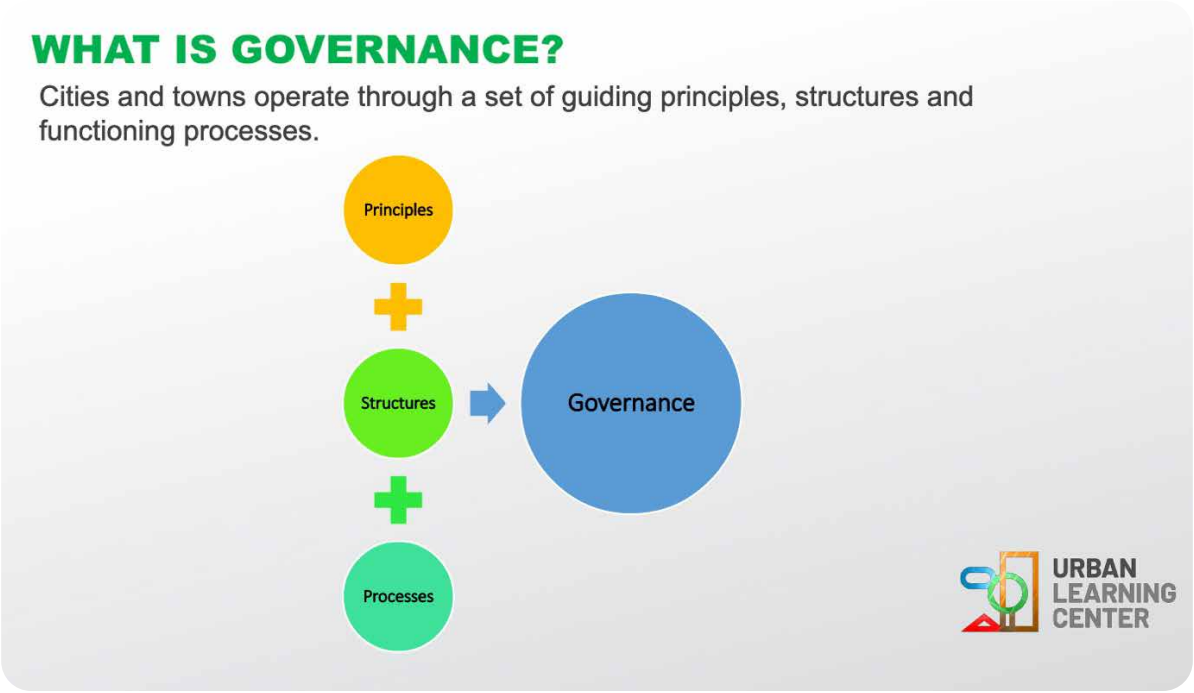
- Why is Governance crucial for making cities smarter and more inclusive?
- What are the main processes and principles of smarter Governance?
- Who are the stakeholders of a smarter and inclusive city?
- What are the key conditions for smarter Governance?
- What are the main enablers and challenges for smarter Governance?

Learning Objectives
On completion of the Module, you will be able to:

- Understand the main concepts, principles, and practices for smarter and inclusive city Governance.
- Understand the importance of Governance for smarter and inclusive cities development.
- Recognize the stakeholders of smarter and inclusive cities.
- Recognize enablers and challenges related to the Governance of smarter and inclusive cities.

2.1 What is Governance?

There is no unique definition of Governance. UNDP defines Governance as “the system of values, policies and institutions by which a society manages its economic, political and social affairs through interactions within and among the state, civil society and private sector. It is a way in how society organizes itself to make and implement decisions—achieving mutual understanding, agreement and action”. [1]



To help your understanding of "what is Governance", we bring different definitions and its main components:

• "Governance refers to the structures and processes designed to ensure accountability, transparency, responsiveness, rule of law, stability, equity and inclusiveness, empowerment, and broad-based participation" [2].

• "Governance **represents the norms, values and rules of the game** through which **public affairs are managed** in a manner that is **transparent, participatory, inclusive and responsive"**. - UN-Habitat

• "Efficient public administrations serve the needs of citizens and businesses. It is essential that public authorities are able to adjust to changing circumstances.". European Commission [3].

As explained in the Foundations for Future Readiness course Module 6: **What is the need for Innovation in the Public Sector?** (see QR below) **Governance** can be understood as a collection of mechanisms (**principles, processes, structures**) that enable how a wide range of stakeholders, work, and learn together – to understand and build a better future for their city or town.

In the table below the key components of governance are highlighted.

WHAT ARE THE COMPONENTS OF GOVERNANCE?

Categories	Description
Stakeholders	Key actors, describe the groups involved and their participation in process and exchanges
Structures & Organizations	Structural or organizational formations that facilitate the interaction among stakeholders or allow for certain processes, coordination structures
Processes	How stakeholders interact using processes
Roles & responsibilities	Stakeholders' roles and responsibilities, (sharing) of power, distribution and steering (setting priorities and defining goals) e.g., role of coordinator, role of funder, role of regulator
Technology & data	Usage of(new) technologies to support or enable particular activities (digital technologies – transformation process), impact of new sources of data or new ways of understanding data
Legislation & policies	Legal framework and policies, policy and legal challenges (data access, social justice)
Exchange arrangements	Constitute the relationships between the public (e.g., government, political or administrative agencies) and the private sector (e.g., firms, companies, citizens) that are subject to change in SCG (cooperation, networks, partnerships among multiple actors – also intergovernmental).

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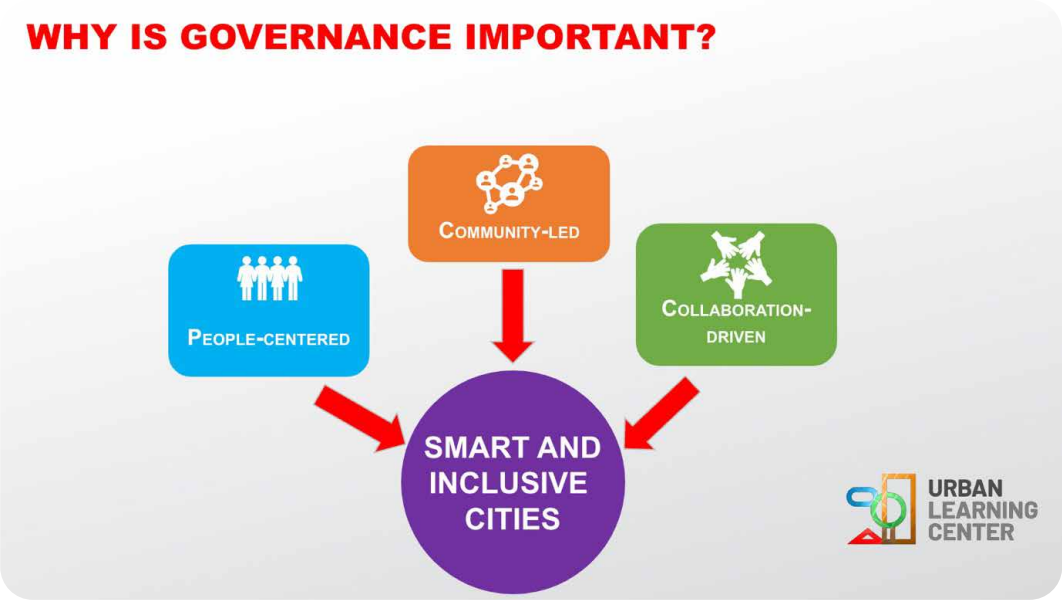
Source: Ruhlandt, R. W. S. (2018). The Governance of smart cities: A systematic literature review. Cities

2.2 Why is Governance important for making cities smarter and more inclusive?

Governance is needed to arrange the collaboration of stakeholders towards decision-making processes that allow for a quick and positive reaction. As we saw, smarter and more inclusive cities need to be people-centered, community-led and collaborative-driven. For this to be possible, it is necessary to adopt governance models that enable collaboration and citizen empowerment.



Governance plays a key role in balancing the social, economic, and environmental dimensions of sustainable development.

Furthermore, it is important to coordinate stakeholders, facilitate long-term planning and investment, foster innovation, and collaboration, ensure equitable access to benefits, and build trust and legitimacy.

Principles of Good Governance

Good Governance – the responsible conduct of public affairs and management of public resources – is encapsulated in the Council of Europe's 12 Principles of Good Governance. These are:

Read more on the **12 Principals of Good Democratic Governance** here

One way to help achieving good governance is the implementation of a ‘service request channel’ to enable residents to request city services and report issues. These channels are often designed to streamline communication between citizens and local government agencies and provide the possibility to rate the quality of the services received (feedback loops).

If you want to see how cities are implementing this, below you can see some examples of cities and regions providing such systems:

The following list of case studies can be tailored and is provided to give a range of potential options.

• Chicago, Illinois, USA - Chicago's 311 system allows residents to request city services and report non-emergency issues like broken streetlights

• Glasgow, Scotland, UK - Glasgow has a "MyGlasgow" service that includes a feature for reporting issues with streets and public spaces

• Los Angeles, California, USA - Los Angeles has the "MyLA311" service, which allows residents to request city services and report various problems

• New York City, New York, USA - New York City uses its 311 system to handle citizen service requests, ranging from reporting potholes to requesting trash collection

• Oxford, United Kingdom - Oxford uses the "Fix My Street" platform to allow residents to report issues with roads, pavements, and other public spaces

• Rio de Janeiro, Brazil - Rio de Janeiro uses the "1746" service for citizens to request services and report a wide range of issues to city authorities

• San Francisco, California, USA - San Francisco's 311 system provides a platform for residents to request services and report a wide range of issues, including graffiti and abandoned vehicles

• Singapore - Singapore has a digital platform called "OneService" that allows citizens to request services, report issues, and provide feedback to government agencies

• Seoul, South Korea - Seoul's "Seoul 120" service provides a channel for citizens to request city services and report issues

• São Paulo, São Paulo, Brazil

• Toronto, Ontario, Canada - Toronto's "311 Toronto" service is a citizen service request channel where residents can report issues and seek information about city services

• Vienna, Austria – Gender Mainstreaming in Vienna

These examples demonstrate how cities worldwide have established citizen service request channels to enhance communication, address resident needs, and improve the overall quality of life in urban areas. The specific services and platforms may vary from city to city, but the common goal is to make it easier for citizens to participate in the improvement of their communities by reporting problems they encounter in their daily lives.

2.3 Which stakeholders are needed for smarter and inclusive cities?

For the successful implementation of smarter and inclusive cities, it is important to establish a collaborative ecosystem, which incorporates stakeholders such as citizens, local government, private sector, NGOs, universities, or research institutions.

This brings the dual **governing** and **Governance** role of local government in collaborative arrangements, **governing** is the responsibility for delivering activities managed by (local) government, and **Governance** is the process of **steering multiple actors** in framing an agenda of vision and action.

The value of local stakeholders

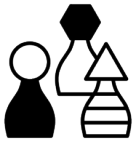
Engaging with local stakeholders will help your municipality consider the needs and desires of anyone who has a stake in the local economy and community, which can foster connections, knowledge sharing, trust, confidence and buy-in for the plan's key proposed initiatives.

It is crucial to identify which individuals and/or organizations are key players in the municipality space and how they are connected. Besides citizens, the stakeholders might include but are not limited to:

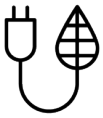
Local businesses and industry associations

Youth, gender and minority groups

Academics and educational institutions



Community-based organizations



Local utility companies and infrastructure providers

Local government: other municipal departments

External donors: regional, central government, financial institutions

Developers and real estate providers

Example: Bristol One City Approach and its Governance Boards

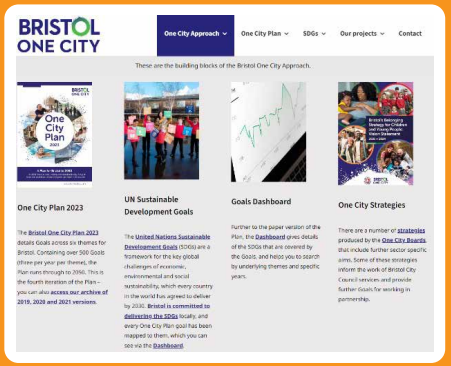
The Bristol One City Approach is one example that brings together a huge range of public, private, voluntary and third sector partners to work together to make Bristol fairer, healthier and more sustainable.

The One City Plan has several themed aims and supporting Boards, working together to deliver on projects that will improve Bristol, and the One City Approach encourages other organizations to take the lead in working collaboratively. Among the themes are:

- Children & Young People
- Economy & Skills
- Environment
- Homes & Communities
- Transport
- Health & Wellbeing
- Culture

Read more about the **Bristol One City Approach** here

The One City Approach has different City Boards, City Partners Group and City Advisory Forums. More information can be found here



Visualization tool: The One City Goals Dashboard. The One City Plan has 546 initiatives, the dashboard allows to filter theme, sub-theme, relevant Sustainable Development Goals, year, or keyword.

On the website you can also see the short survey that the city uses to collect feedback or suggestions for future goals and to improve the tool.

2.4 What is smarter and inclusive city Governance?

The Governance of smarter and inclusive cities includes the management of long-term relationships with stake-holders within and across government, business and societal sectors including citizen participation and co-decision-making in public affairs.

At the city level, the use of technology can help to improve internal operations, enable collaboration and interaction between stakeholders, as well as enable citizen participation to ensure inclusiveness and equal opportunity for all.

The use of technology in Governance can also foster civic engagement and open, participatory Governance through ICTs, as electronic participation (e-participation). However, technology is only useful if it is accepted and used by citizens. As a tool, it needs to be user-friendly, and it can help if applied in an inclusive way.

E-Participation is about fostering civic engagement and open, participatory Governance through ICTs. Growing evidence points to the rapid expansion of e-Participation as a tool for engagement and strengthened collaboration between governments and citizens. Its objective is to improve access to information and public services as well as to promote participation in policy-making, both for the empowerment of individual citizens and the benefit of society as a whole [5].

Example: KYIV Digital: Kyiv Digital - Public Services and E-Democracy in one App - The Innovation in Politics Institute

Other examples of E-Participation initiatives can be seen below:

Country	Platform / Title of initiative	Link
Belgium	Leuven, co-create it	https://leuvenmaakhetmee.be/
France	Parlement et Citoyens	https://parlement-et-citoyens.fr/
Germany	meinBerlin	https://mein.berlin.de
Ireland	OpenConsult	https://civiq.eu
Latvia	MyVoice	www.manabalss.lv
Lithuania	E-Citizen	https://epilietis.lrv.lt/en/
Netherlands	De Stem van West	https://stemvanwest.amsterdam.nl/
Norway	Minsak.no	https://www.minsak.no
Slovak Republic	Slov-lex	https://www.slov-lex.sk
Spain	Decide Madrid	https://decide.madrid.es/
Sweden	Gothenburg proposal	https://goteborg.se/wps/portal/start/kommun-o-politik/-sa-kan-du-paverka/har-du-ett-battre-forslag/goteborgsforslaget/om-goteborgsforslaget
United Kingdom/ Scotland	We asked, you said, we did	https://consult.gov.scot/we_asked_you_said/

2.5 Inspirational case study: Participatory Budgeting in Tartu, Estonia

One approach for smarter and inclusive governance enabled via digital technology is participatory budgeting (PB).

PB is capable of generating multiple impacts on cities, governments, and local communities, making it a promising way for disseminating information, increasing awareness. Good governance through the PB approach requires the combination of offline and digital tools to engage local communities. In 2019 there were already more than 6,000 experiences listed across at least 40 countries of PB implementation [6].

Vienna provides an exemplary case of gender-responsive participatory budgeting. This approach integrates a gender perspective at every stage of the budgeting process to ensure that the needs of all community members, especially women, are met. Vienna's model involves analyzing gender gaps and allocating resources to address these disparities effectively. The city employs both digital platforms and traditional community meetings to facilitate broad participation, ensuring that women's voices are heard and their unique needs are considered in budget allocations. This method not only promotes equity but also enhances the overall effectiveness of public spending by aligning it with the diverse needs of the population. Read more about gender-responsive budgeting here:

Inspirational case study - Participatory Budgeting in Tartu, Estonia.
Tartu is the second largest city in Estonia with a population of 97,923 inhabitants and the first city in Estonia that began experimenting with participative budgeting in 2013. Citizens of Tartu can decide how their city should spend 200,000 EUR, which is about 1% of the subsequent year's investment budget.

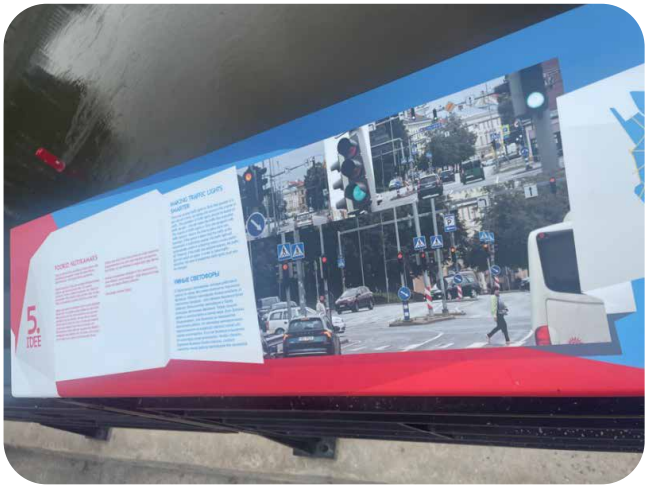
TARTU PARTICIPATIVE BUDGETING

Tartu has set three goals for participative budgeting:

- Improve understanding of the city budget and its shaping process
- Boost cooperation between communities
- Find solutions to practical problems within the city by implementing citizens' ideas

How does it work?
The Participative Budgeting Process in Tartu:

- **Call for Ideas.** Every citizen can present an idea, but the criteria are that it must qualify as an investment (object, building, etc.)
- **Expert Opinions on Ideas.** The ideas presented will be analyzed by experts in their respective fields. Experts consider the feasibility of the ideas from various aspects, including financial, temporal, and technical.
- **Discussions.** In-depth discussions of the ideas and their impact will be held between the experts and the people behind the ideas to determine which ideas go forward to the final vote.
- **Presentation of Ideas.** The city government will present the selected ideas on the city's homepage, in public city spaces, via social media, etc.
- **Public Voting.** Citizens will have the opportunity to vote, using both traditional and electronic means. Every resident of Tartu, aged 16 years or more, is eligible to vote (3 votes per person).
- **Implementing Ideas.** The two ideas which gather the most public support will be implemented.



This is a good example of how to engage citizens in the decision-making process of a municipality. You can learn more about the initiative **here**

2.6 What are the enablers and challenges related to the governance of smarter and inclusive cities?

There are a variety of enablers for good Governance. In particular, the importance of transparency to increase trust, and knowledge and information sharing to avoid conflicts and to foster open and collaborative environments are each recognized as important factors.

SMARTER GOVERNANCE ENABLERS

- Transparency and openness
- Supportive government policies
  - Digital principles, open-source solutions
- Collaboration
  - Citizen empowerment
  - Collaborative decision-making processes
  - Co-production and Co-creation
  - Multiple stakeholders' engagement
- Use of bottom-up approaches
- Communication, Information and Knowledge Sharing
- Urban proactiveness for service provision
- Capacity planning
- Strategy and vision definition
  - Clear definition of roles and responsibilities
  - Align and manage conflicts of interests
  - Use of compliance tools
- Data Governance
  - Collection of data
  - Data privacy
  - Interoperability
  - Data Exchange within institutions
  - Data-driven decision making

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Among the list of Governance barriers are the lack of planning, lack of communication, and lack of leadership to run smart developments effectively. Therefore, the uncoordinated implementation of initiatives might result in isolated efforts creating the risk of putting projects on hold due to the lack of resources.

Another range of challenges refers to the complexity of organizational structures and political issues. Frequently, the administrative structure of cities is organized in isolated silos (operational nodes), occasioning a lack of internal coordination and cooperation [7].

Another challenge is the risk of focusing too much on technology as a solution and not as a tool.

SMARTER GOVERNANCE CHALLENGES

- Lack of planning (resources/HR Capacity)
- Lack of Capacity
  - Lack of Management skills
  - Lack of capacity building
  - Lack of IT knowledge among city planners
- Organizational
  - Complexity of organizational structures
  - Lack of internal coordination and cooperation
  - Need of balancing centralized / decentralized mechanisms
- Management of Public-Private Partnerships
- Multiplicity of policies and programs (local, regional, national)
- Political
  - Lack of political will
  - Political instability
  - Lack of transparency
- Lack of standards and KPIs for measuring performance
- Lack of Regulation
- Lack of information sharing

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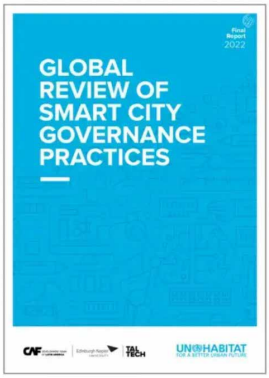
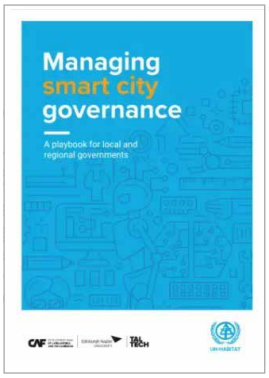


A good source for additional information regarding Smart City Governance practices is the UN-Habitat Report: **Global Review of Smart City Governance Practices**



and the **Managing Smart City Governance – A playbook for local and regional governments**

2.7 Reflection activity

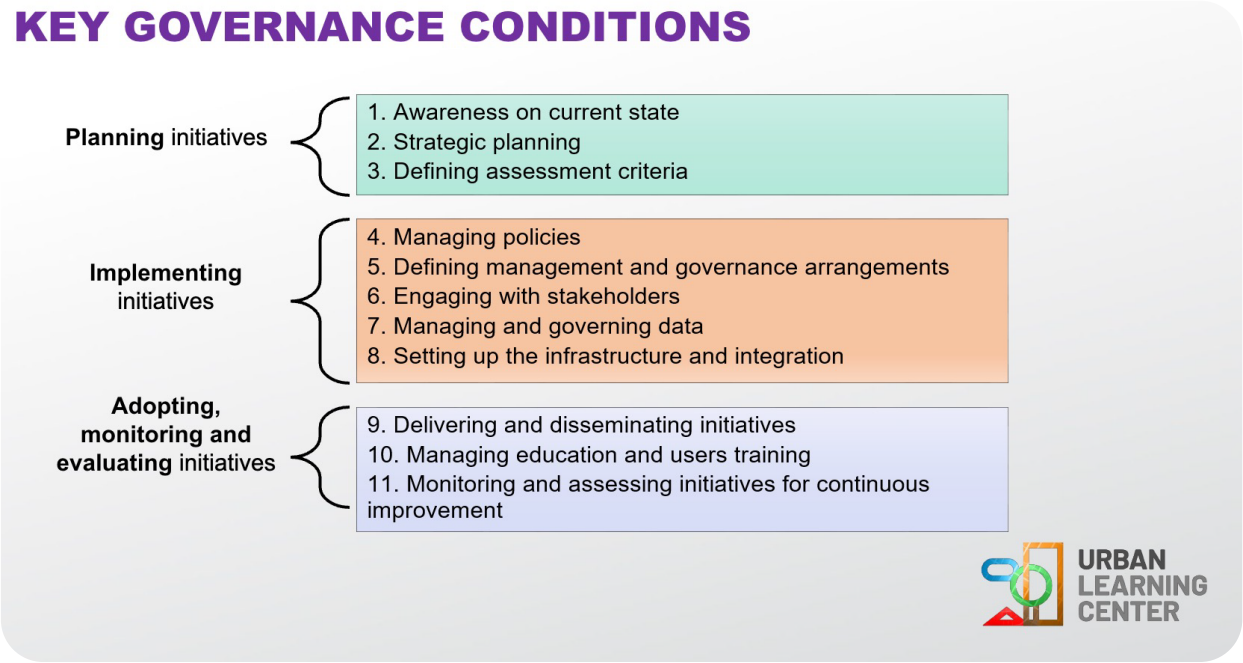
Reflect on the questions below:

- Among the listed challenges, which one do you think is most challenging for your city or town and why?
- What actions might be required to overcome this challenge?

2.8 Key Governance conditions for the development of smarter and inclusive city' initiatives

To help define a path to address local Governance and challenges, eleven key Governance conditions for developing strategies for smarter and inclusive cities' initiatives are suggested.

The key conditions are divided into three main phases, moving from the planning as preliminary activity, to the implementation of initiatives, and finally to the adoption and evaluation phase. These phases will be covered in the next modules of the Smarter and Inclusive Cities course.



Recommendations that can possibly lead to improvements in smarter and inclusive city Governance capacity are:

• Defining a strategy that includes a shared vision with stakeholders to promote city attractiveness and competitiveness, accessibility, social inclusion and responsiveness to different needs and challenges experienced by citizens based on their gender, age, ethnicity, disability status, and their intersection.

• Analyzing the current situation, conducting a gender and intersectional analysis, adapting to the context and allowing flexibility and responsiveness to local challenges and needs.

• Defining a dedicated organization, department, experts (on gender, disability, etc) or person for promoting and supervising initiatives and ensuring these are truly inclusive and responsive to different needs.

• Encouraging interactive and participatory services, promoting co-production, co-creation, and bottom-up approaches.

• Engaging stakeholders and allowing cross-sector and external collaboration.

• Enabling information and knowledge sharing and making use of different communication channels.

• Defining roles and responsibilities.

• Establishing supportive policies, ensuring political will, synergy among different departments.

• Establishing a comprehensive and gender-responsive regulatory framework.

• Strengthening access to training and education programs to increase IT knowledge among city planners and operational capacity.

• Defining key performance indicators (KPIs) with integrated gender perspectives/dimensions and ensuring the use of compliance, monitoring and assessment tools.

2.9 Key messages

Creating a smarter and inclusive municipality requires the involvement of a range of stakeholders. Governance plays a crucial role in the management of long-term relationships with actors within and across government, business, and society.

Digital technologies can enable new opportunities to engage stakeholders, but there are a range of challenges that should be considered. Effective Governance structure and making the most of communication channels can help address complex challenges for smarter Governance.

In summary, Governance encompasses social norms, people, policies, partnerships, practices, data and information, and technologies for:

- balancing the social, economic and environmental dimensions
- making use of ICT to connect the elements of a region
- managing long-term relationships with stakeholders
- empowering citizens and fostering participation

2.10 Test your learning and reflect

1) Which of the following definitions better describes Governance?

a) Governance can be understood as managing a city or town.
b) Mechanisms and tools to better govern internal structures.
c) Mechanisms (principles, processes, and structures) that enable public officials and/or civil servants to organize, work and learn together to understand and build a better future for their city/town.
d) Principles, structures, and processes used in the public administration.

2) Please share examples of initiatives in your city or town that involve citizens in decision-making through the use of digital tools.

3) Which forms of communication are used in your city or town for stakeholder engagement that could contribute to the development of smarter and more inclusive cities?

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Module 3

Planning for Smarter and Inclusive Cities

Module 3

Planning for Smarter and Inclusive Cities

3.1 What this module will cover

This module unpacks planning for smarter and inclusive cities - focusing on smart and inclusive city strategies, particularities of planning a smarter and more inclusive city or town, and typical thematic areas of action.

Learning Objectives:
On completion of the module, participants will be able to:

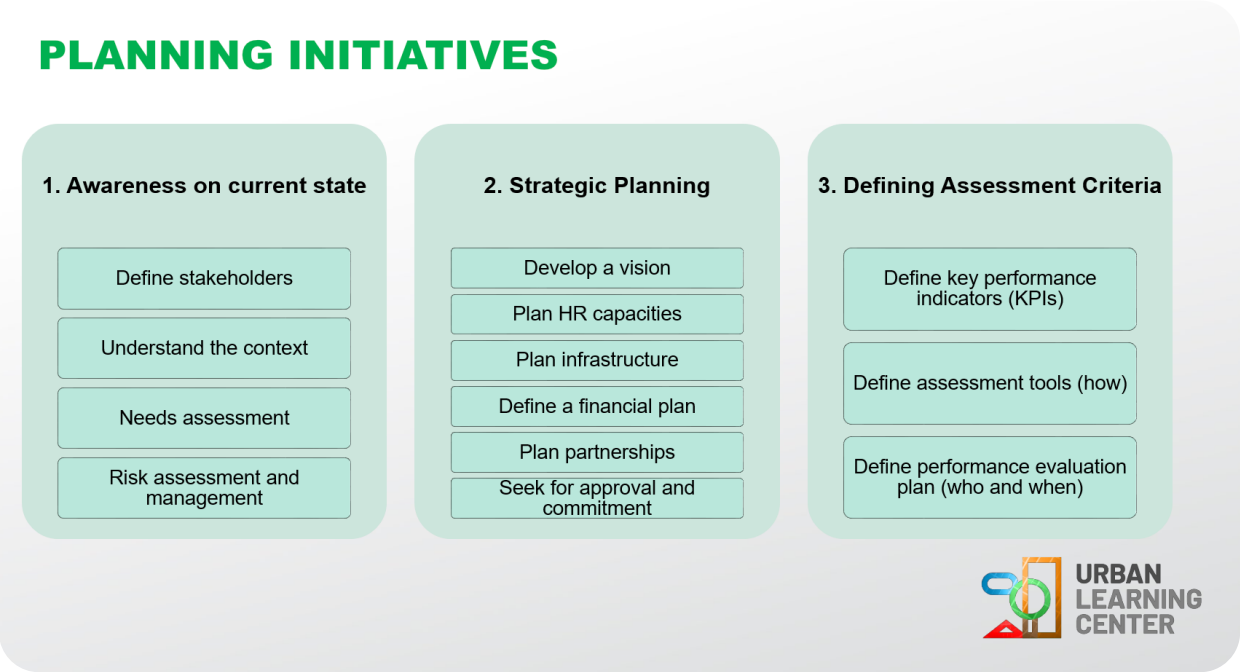
- Understand the benefits and main aspects of smarter and inclusive city planning.
- Understand the importance of strategy definition for smarter and inclusive cities.
- Understand typical city thematic areas of action with many examples.

3.2 Planning for smarter and inclusive cities

As you have seen in the previous module, there are some key Governance conditions that help the development of smart and inclusive cities.

This module covers the planning and strategy making process, which are important for the success of a smarter and inclusive city development.

The planning phase contains three main steps or conditions: awareness of the current state, strategic planning and defining the assessment criteria. Each of these elements should be included in a smarter and inclusive city strategy.



The awareness of the current state is achieved by defining stakeholders, understanding the context, needs assessment, and risk assessment and management.

The second condition of the planning phase is the strategic planning, achieved by developing a vision, planning human resources capacities, planning infrastructure, defining a financial plan, planning partnerships, and seeking for approval and commitment.

The third condition of the planning phase is the definition of assessment criteria, is achieved by defining Key Performance Indicators (KPIs), meaning what you will be checking later to see the progress of your initiative, defining assessment tools (how the KPIs will be checked), and defining performance evaluation plan (who will check the KPIs and when). [1]

It is important to review global and local context and existing actions in your municipality.

The idea of this planning process is to not duplicate work that has already been carried out but rather identify gaps or complementary areas for actions to help the municipality develop in a more sustainable and future-proof way.

Global agendas can be used as a starting point to identify the current state of your municipality.

THE NEED TO REVIEW GLOBAL AND LOCAL CONTEXTS

More and more cities around the world are using the SDGs as benchmarking of sustainable development. This can be done through a Voluntary Local Review (VLR) of the 2030 Agenda and its 17 SDGs and 169 targets.

KEY GLOBAL AGENDAS

Some of the reference (global) agendas

EU Green Deal

- No net emissions of greenhouse gases by 2050;
- Economic growth decoupled from resource use;
- No person and no place left behind.

New Urban Agenda

- Social sustainability
- Economic sustainability
- Environmental sustainability
- Spatial sustainability

Sustainable Development Goals

- Pathways for Economic Growth relates to key elements of sustainable urban development and the goals of the 2030 Agenda for Sustainable Development

Paris Agreement

- Adaptation (dealing with impacts of climate change – 1.5°C);
- Loss and Damage (minimising loss and damage linked to climate change); and
- Role of cities (building resilience).

Photo by Mika Baumeister on Unsplash

Here you can see an overview
of many of the city SDG reports.

Lviv city council

CITY INSTITUTE

SUSTAINABLE DEVELOPMENT GOALS

VOLUNTARY LOCAL REVIEW
OF ACHIEVEMENT OF THE SUSTAINABLE DEVELOPMENT GOALS

LVIV 2023

Here you can see an overview
of many of the city **SDG reports**

3.3 Smarter and inclusive cities strategies

When planning the development of smarter and inclusive city initiatives, it is important to develop a strategy to get commitment, avoid conflict of interest and get support for project development.

Developing a strategy can help you to:

- **Synthesize** information gathered in the local context analysis
- **Identify priorities** for the municipality development
- Setting clear and ambitious societal goals (**"Missions"**) and using the power of government to drive innovation and create public value
- Create a **vision** for the medium-term
- **Involve the local community** and stakeholders in shaping goals and objectives for the plan
- **Explore possible futures** and decide on a vision

The steps of strategy making are illustrated below:

A smarter inclusive city strategy helps to move from a defined vision to a goal and actions, as exemplified below from the City of Vienna.

The focus of the smart cities strategies includes reduction in digital inequality, greater focus on risk groups, reuse and development of ICT solutions, proactive and individual e-services, greater linking of technologies with the development needs of the city.

In the last years, the emphasis of smart city strategies has shifted from ambitions to achieve efficiencies in service provision towards also pursuing ambitions for a higher quality of life for citizens and more sustainable living and a more holistic approach to “smartness”.

This shift has corresponded with the evolution of the smart city concept from a technology-led narrative on how service efficiency can improve, to a citizen-centric narrative on how services and infrastructure can be transformed to improve the lives of citizens. The ambitions usually include:

1) Economic ambitions - Cities that seek to use technology to improve services and create efficiencies, while attracting investment and boosting economic development.

2) Social ambitions - Cities that want to encourage inclusivity, transparency, trust and empowerment of citizens.

3) Environmental ambitions - Cities that seek to achieve environmental sustainability.

Take a look at some inspiration of how cities have developed smarter and inclusive city strategies with the help of city networks:

- Eurocities: https://eurocities.eu/
- C40: https://www.c40.org/
- Global Goals for Cities: https://urbact.eu/networks/global-goals-cities
- Smart Cities Marketplace: https://smart-cities-marketplace.ec.europa.eu/
- ICLEI – Local Governments for Sustainability: https://iclei.org/
- INTA – International Urban Development Association: https://inta-aivn.org/en/
- Leading Cities: https://leadingcities.org/about
- Open and Agile Smart Cities: https://oascities.org/
- Smart Cities Council: https://www.smartcitiescouncil.com/
- Standards networks, e.g. City Standards Institute: https://www.bsigroup.com/en-GB/smart-cities/
- United Cities and Local Government: https://www.uclg.org/
- 100 Resilient Cities: https://www.rockefellerfoundation.org/100-resilient-cities/
- Women in Cities International: https://femmesetvilles.org/

3.4 Inspirational Case Studies: Examples of Strategies for Smarter and Inclusive Cities

In this section, you will find inspirational cases of strategies for smarter and inclusive cities from:

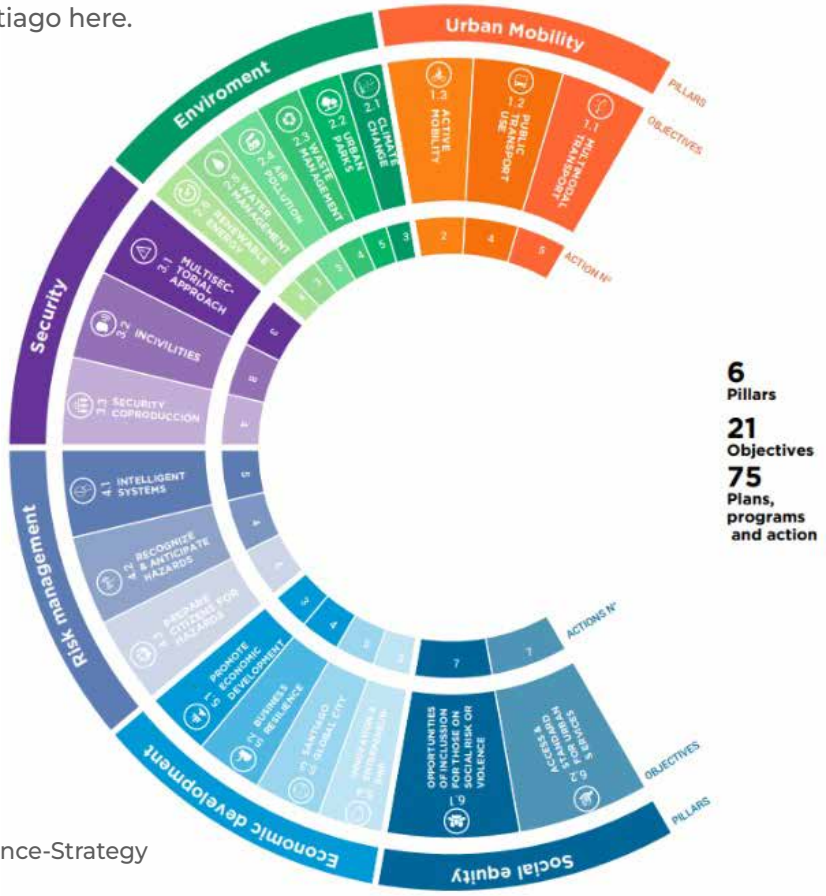
- Santiago, Chile
- Vienna, Austria
- Stockholm, Sweden
- Tallinn, Estonia
- Berlin, Germany
- London, United Kingdom

HUMAN & RESILIENT SANTIAGO

The Santiago +B project is embedded in the city's overall resilience strategy, which comprises the four focal areas of :

- Human approach (placing people at the center of discussion),
- Participatory city (including key stakeholders in decision-making),
- Territorial intelligence (making the best decision for each territory in the city in light of its respective particularities) as well as,
- Promoting the right to the city (providing access to the city's services to all citizens).

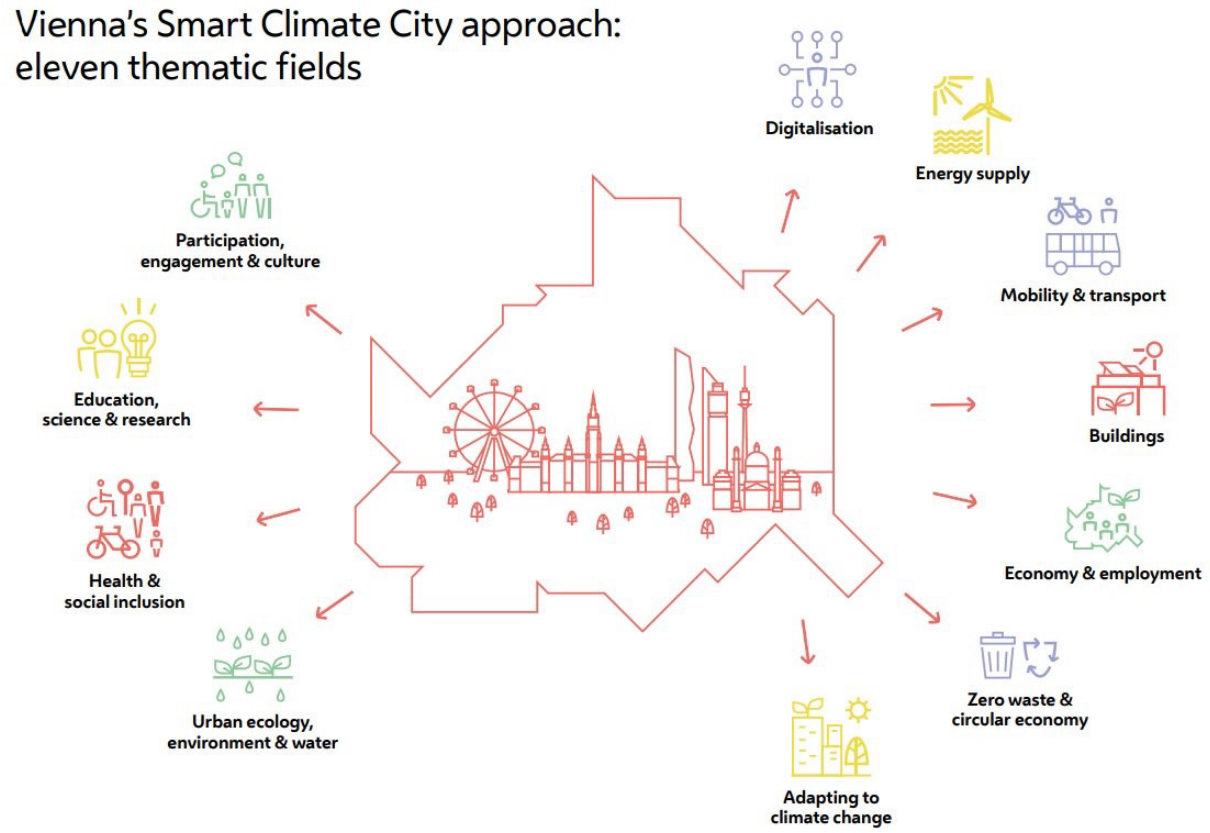
Read more about Human Resilient Santiago here.



Source:
Santiago-Resilience-Strategy

VIENNA'S STRATEGY FOR SUSTAINABLE DEVELOPMENT

The Smart City Strategy is the overarching strategic framework for the myriad individual climate action measures implemented in Vienna. A plan that sets out the steps to be taken in a format that is clear and transparent for all.



Vienna's Smart City approach develops its full impact and effectiveness through the combination and interplay of the three dimensions: Quality of Life, Resource Conservation and Innovation. These three dimensions are translated into concrete goals in eleven thematic fields, which are strongly interconnected and thus give rise to synergy effects.

Read more about **Vienna's strategy for sustainable development** here

Access the **Full Strategy** here

Buildings become sources of green power

- through solar energy installations on roofs and facades
- through efficient heating systems and state-of-the-art building materials and techniques that save and store energy
- with greened roofs and facades that improve air quality and mitigate traffic noise
- with greening measures that provide a habitat for bees and other insects

Streets become outdoor living-rooms

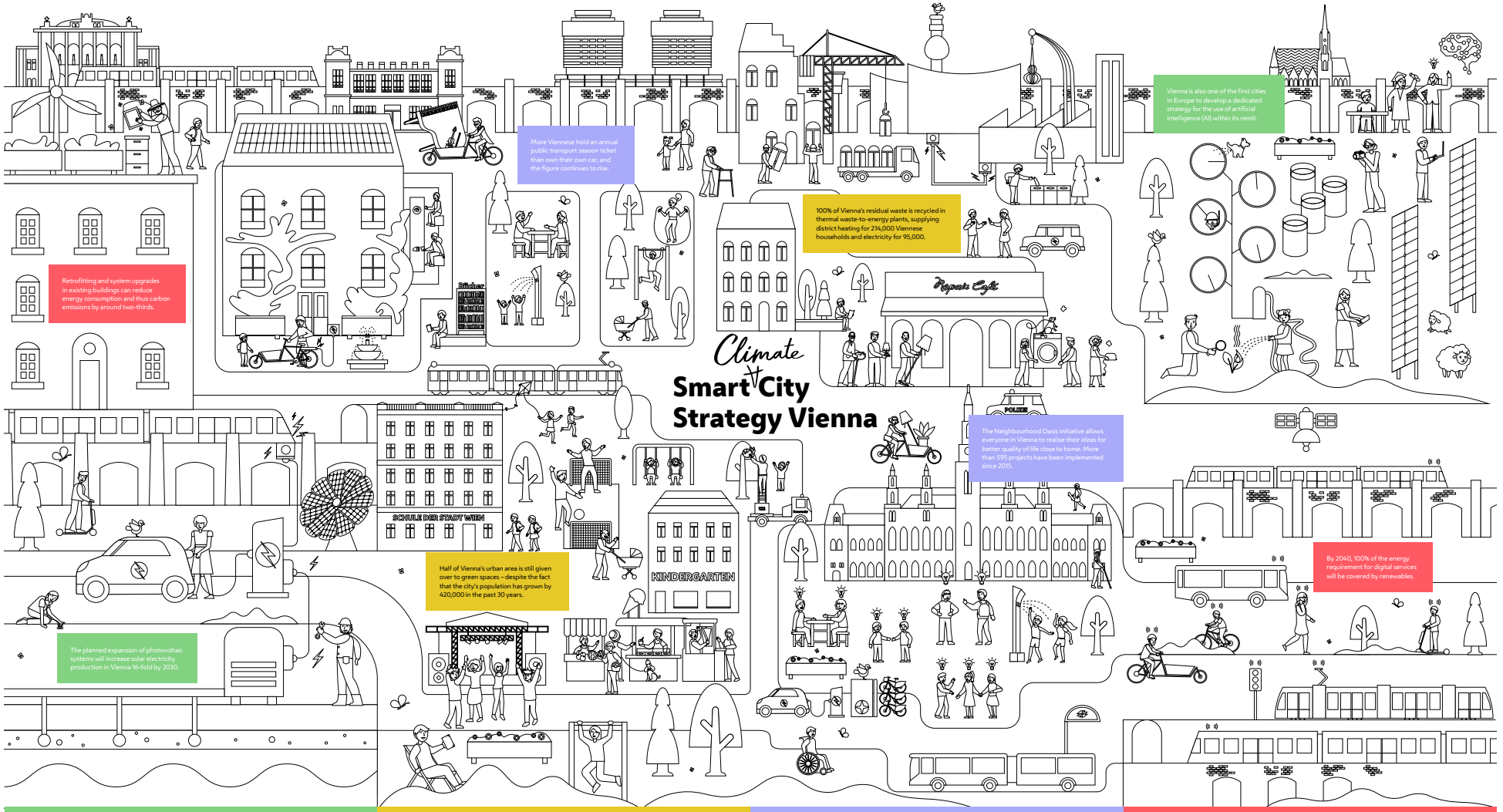
- with more space for walking and cycling
- through redesign and re-arrangement of public spaces
- with additional trees providing shade
- with more space for play, strolling and street festivals

Waste is a source of valuable raw materials

- through urban mining in the construction sector
- with products that are developed in line with the principles of the circular economy – durable, reparable, reusable and recyclable
- with waste management systems that focus on waste avoidance, recycling and utilisation of waste heat from thermal waste processing

Vienna's expertise is an international bestseller

- when it comes to developing and implementing new technologies and solutions
- in piloting new forms of participatory policy-making, co-creation and open innovation
- through targeted education options, new occupational profiles and smart jobs



Vienna runs on clean energy

- by recovering energy from sewage sludge and every single time a train brakes on the underground network
- by using the "waste" heat constantly generated by production or data storage facilities to power local heating and cooling networks
- by heating buildings and water using solar energy, or heat pumps and district heating systems powered by geothermal energy from up to 3000 metres below ground

Urban neighbourhoods are a microcosm

- with all local services and amenities within walking distance
- thanks to a green infrastructure of shady parks and green spaces on the doorstep and climate-proof redesign of local streets and squares
- with local networks of educational institutions
- with sports grounds and other outdoor spaces available for leisure activities outside opening hours

Vienna is a city of 1000 ideas & initiatives

- from new shared-use services to innovative mobility and housing options
- through introduction of participatory budgeting for climate mitigation and adaptation measures and child & youth projects
- with urban "cultural labs" to explore and pilot alternative approaches and concepts for the future

Digital data are an urban tool

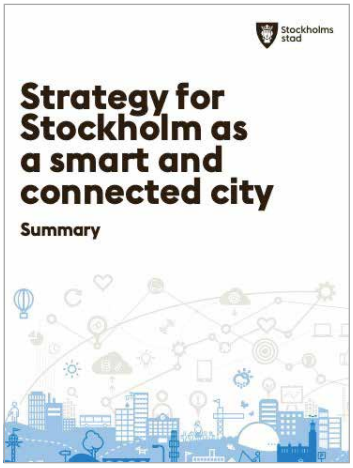
- thanks to smart energy grids that reduce energy consumption and optimise networks of energy producers and consumers
- thanks to the development of a "digital twin", i.e. a complete digital replica of the city, incorporating data from a wide range of sources to flag up potentials for reducing carbon emissions
- with sensors, digital platforms and apps offering improved mobility options and facilitating smart traffic management

STRATEGY FOR STOCKHOLM AS A SMART AND CONNECTED CITY

In order to reach its vision of becoming a smart city, Stockholm will stimulate, guide and coordinate different digitalization projects. The strategy for Stockholm as a smart and connected city, together with the city's upcoming digitalization programme, describes how this should be done. The way forward to make Stockholm a smart and connected city is through innovation, openness and connectivity. And by making the city sustainable in four areas – economic, ecological, democratic and social sustainability – the target is achieved: A Stockholm for all.

The strategy to become a smart and connected city has been developed together with residents, academia, business and analysis of global developments, meaning using a **collaborative approach**.

The implementation of the strategy consists of three main areas: **coordination** and **collaboration** (internally and externally, which implies commitment and responsibility for all parties), **communication** (and dialogue with residents), as well as prioritized projects.

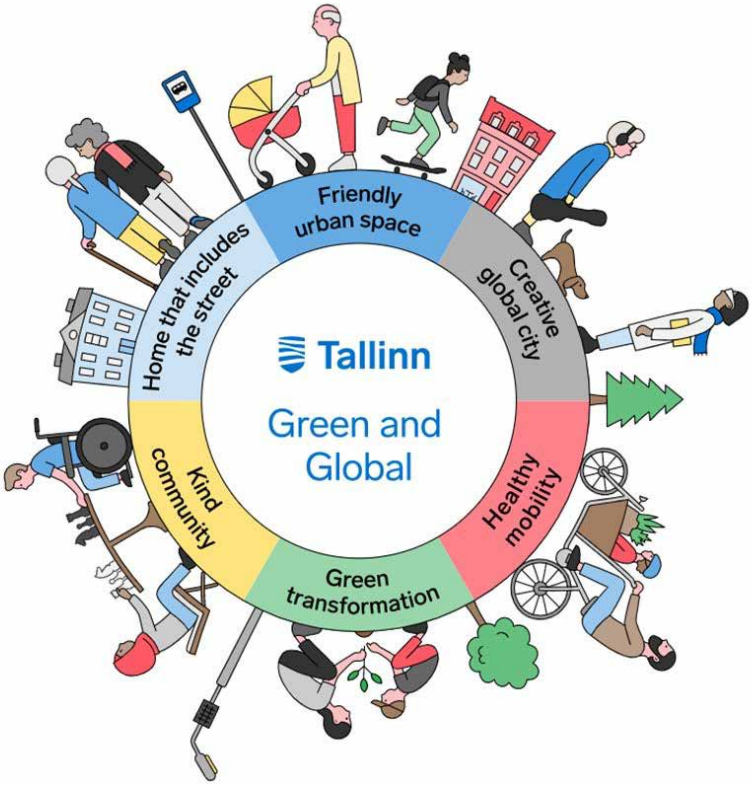


Read more about **Stockholm's strategy** here

By making the city sustainable in four areas, the target for the City's digital development is achieved.

TALLINN 2035 STRATEGY

Tallinn's way to become a smart city revolves around three keywords: accessibility, interoperability, and user-friendliness. In this respect, the city has managed to harmonize its urban and digital development with the evolution of Estonia as a digital society. Tallinn 2035 is an example of a strategy directly connecting its actions with the SDGs.



Read more about **Tallinn's Smart City Strategy** here

DIGITAL TOGETHER: BERLIN

In terms of Berlin's Smart City concept, "smart" means tackling challenges sustainably, focusing on the common good and working collaboratively – and all that while shaping change processes in a resilient manner. "Digital Together: Berlin" therefore defines not only WHAT is to be done, but above all HOW individual goals are to be achieved on the path to a smart Berlin. Under the motto, "Transformation with the whole city", the strategy is oriented toward the needs of Berliners and supports the professional goals of all departments.

"Digital Together: Berlin" is:

1. Aligned with the needs of Berliners;
2. Not a specific strategy, but an "enabler" that supports existing goals and strategies;
3. A learning strategy;
4. A strategy that includes Governance, a participatory implementation concept, measures and their success monitoring.

Source: Smart City Berlin

Key practices adopted by Berlin:

• **Developing Ideas Together**
Participation takes center stage in "Digital Together: Berlin". In specific terms, this means that all groups of urban society have been involved in the development of the strategy from the very outset. They contributed their wishes and ideas and, together with the political institutions, worked out a "transformation programme" towards a future, smart Berlin. The citizens will be actively involved in the implementation of "Digital Together: Berlin" - in an open, learning process that will only work with everyone's participation.

• **The Arena of Ideas: Jointly developing and refining new measures**
The Arena is where residents can network with potential cooperation partners and share their ideas. The Arena of Ideas helps players in urban society to develop ideas into measures.

Read more about the **Arena of Ideas** here

• **The handbook: how the city supports the implementation of projects**
Berlin is starting to become more citizen-friendly and sustainable. How can this be implemented? A handbook (in German) provides a structure for setting up and implementing projects, as well as methods for achieving goals – together across boundaries of authority, together with players in urban society.

Read more about the **Digital Together: Berlin Strategy**

SMART LONDON STRATEGY

The Mayor of London's roadmap to transform London into the smartest city in the world is more focused on digital transformation.

To make London smarter, five main missions were defined:

- Mission 1: More user-designed services
- Mission 2: Strike a New Deal for City Data
- Mission 3: World-class connectivity and smarter streets
- Mission 4: Enhance digital leadership and skills
- Mission 5: Improve city-wide collaboration

The London's Chief Digital Officer has set out six key priorities for 2021 to 2024:

1. Digital Access for All: to enable Londoners to get the skills, connections, devices or other support they need to be online.
2. A new city data platform to better use the city's collective data legally, ethically and securely for the benefit of all Londoners.
3. A new Emerging Technology Charter for London to guide and inform how new technologies are trialed and deployed in our city.
4. Scaling Green Tech to ensure that there's a widespread adoption of green innovation through common design, Governance and commissioning of smart projects across the city.
5. Open Innovation with the tech sector through high-value and status competitions around the Green New Deal or improved mobility.
6. Common digital platforms serve Londoners better by building the necessary in-house digital and data capability to make, share, reuse or buy products and services.

Read more about **Smart London Strategy** here

Source: Smarter London Strategy

3.5 What are action themes for smarter and inclusive city development?

As we saw from the several examples of city strategies, smarter and inclusive cities incorporate action themes spanning across all dimensions of urban life: from challenges associated with the physical environment, e.g., buildings and transport, to those related to the social dimension of urban life, e.g., inclusion and engagement. Although city planning is often more associated with tackling challenges in the built (physical) environment, all these aspects are crucial for people-centered city development.

Smart city dimensions are typically grouped into six interconnected smarter and inclusive city action themes. They summarise not only the main directions of actions currently being undertaken by different cities around the world but also key themes of the global agendas for sustainable development, e.g., the EU Green Deal and UN Sustainable Development Goals.

All action themes overlap and complement each other. They also have direct links to Pathways for Economic Growth (P4EG) objectives. For example, 'Cleaner energy and cutting-edge clean technological innovation' is related not only to Smart Environment but also to Smart Economy and Smart Governance, while the objective of 'Future-proof jobs and skills training for the transition' stands at the intersection of Smart Society, Smart Economy, and Smart Governance. The next sections will briefly introduce each action theme and its subthemes and provide some examples of smart and inclusive city actions.

3.5.1 Smart Environment

Smart Environment is probably the broadest action theme for smarter and inclusive city development, covering a range of key city challenges, including energy, built environment, resource management, and various environmental issues. It is often broken down into sub-themes in city strategies, allowing the integration of more focused actions to tackle local challenges.

One of the key city challenges is energy, which deals with energy generation, storage, and consumption to make the energy systems more efficient and sustainable. Cities also aim to facilitate behavioral change and the introduction of new business models to support technological innovations and accelerate the transition toward climate neutrality.

Urban energy systems are closely linked with the built environment, another key dimension of the Smart Environment. The built environment is the human-made component of our cities, incorporating buildings, infrastructure, and public spaces surrounding us. Smart and inclusive city development aims to make the built environment more sustainable and livable, using data-driven and participatory approaches to urban planning.

For example, the city of **Grabovo (Bulgaria)** upgraded its lighting system to make it smart and more energy efficient. As a result, the municipality cut the energy consumption of the replaced luminaires by more than 70%.

Read more about
Grabovo's initiative here

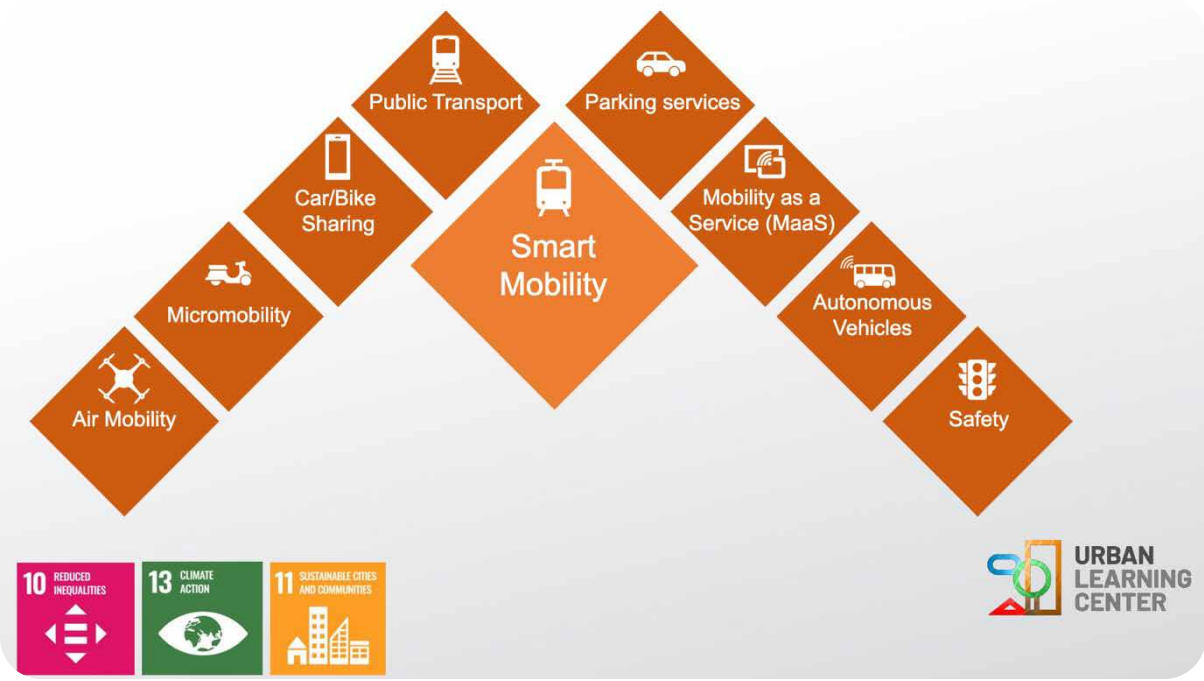
Finally, Smart Environment also deals with different environmental challenges in cities, e.g., environmental protection, pollution, water management, and waste management. The city of **Ljubljana (Slovenia)** has been a frontrunner in Europe in setting up a smart waste management system. By incorporating smart solutions into the existing waste management, the city monitored the amount of waste that citizens were producing and optimized its waste-collection route based on population density and the size of neighborhoods. It allowed the city to achieve the impressive result of more than 63% of collected waste being sorted correctly by 2016. Now, Ljubljana has committed to zero waste and aims to halve its amount of residual waste and to improve its recycling rate to 78% by 2025.

Read more about **Ljubljana's Smart Waste Management** here

It shows how designing and piloting different smart solutions can facilitate systemic changes aimed at reducing the environmental impact of urban living and transitioning toward more sustainable lifestyles.

3.5.2 Smart Mobility

When we think about mobility, we primarily focus on transport as the primary medium to get around the city. Nowadays, strategies for addressing mobility challenges have moved beyond this narrow focus and look at mobility as an interplay of different sustainable ways to move around the city, including walking, cycling, public transport, etc.



Smart Mobility aims to optimize and improve the existing mobility services and infrastructure to facilitate sustainable, efficient, and safe travels within the city. It, in turn, has a positive impact on the environment by reducing GHG emissions and improving air quality.

The objectives of Smart Mobility are to improve network and traffic management systems, increase safety levels and reduce traffic accidents, increase efficiency in communications and travel times, ensure environmental and economic sustainability, and offer citizens a new community perspective [3]. It has led to providing more efficient public transport services, car and bike sharing, different micro-mobility options, and even Mobility as a Service (MaaS) solutions that integrate various forms of transport and transport-related services into a single, comprehensive, and on-demand mobility service [4]. Moreover, new technological solutions like autonomous vehicles and drones challenge the traditional perspectives on urban traffic and its organization, requiring us to rethink how future mobility in the city could really look like.

Cities worldwide have been working on improving their mobility services to create both environmentally friendly and more convenient transport options for their residents. For example, the city of Cologne (Germany) introduced ten mobility stations and deployed 54 different e-vehicles (cars and bikes) in the different mobility stations in collaboration with mobility service providers. In this way the city aims to encourage behavioural change away from cars toward more active modes of transport like walking, cycling, and public transport.

Similarly, the City of **Tartu (Estonia)** has been incentivizing residents to change their mobility behaviour by deploying a bike-sharing system with 750 bikes in 69 bike docks across the city. Resulting from a participatory planning process and continuous user feedback, the service proved to be an unprecedented success and has increased the share of cyclists in Tartu. It shows how seemingly small changes implemented in collaboration with local citizens can have a substantial impact on city life.

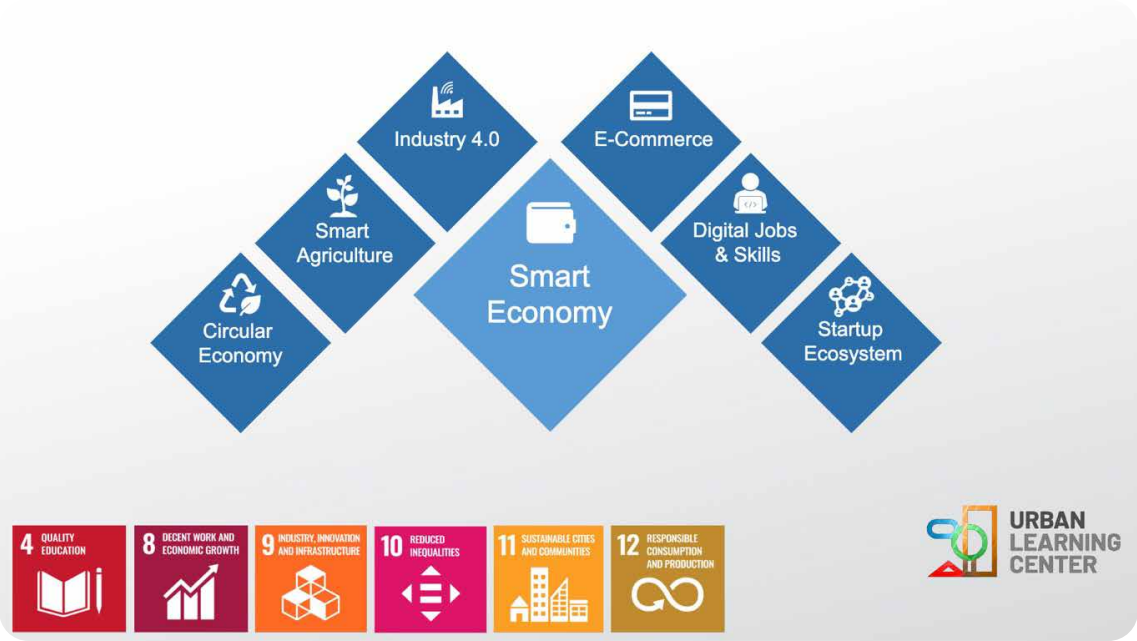
Source: Source: Babble Smart Cities EU.

Learn more about the **Walkability aspect of Urban Planning** through the video below

Learn more about why urban mobility is a key topic in a post-COVID-19 world in this **UNDP article**

3.5.3 Smart Economy

With the technological and economic shifts brought about by globalization, cities are now facing the unprecedented challenges of simultaneously sustaining productivity and sustainable urban development. It requires shifting our thinking from the traditional understanding of economy primarily concerned with growth and development toward a Smart Economy, enabling new qualitative approaches to economic growth focused on the quality of life and the standard of living [5]. Such an approach requires harnessing people's creative and innovative potential by developing digital skills and setting up collaborative ecosystems, e.g., a startup ecosystem where new ideas can emerge and develop.



Smart Economy also proposes to rethink our approaches to traditional economic activities like commerce, manufacturing, and agriculture. Although e-commerce is nothing new, it saw a new growth spur during the global pandemic, demanding to adjust the ways we think about commercial activities in the city. Some of these activities have seen at least a partial 'return to normal', but others have shifted to e-commerce permanently.

The technological advancements of the last decade have also pushed manufacturing toward a new industrial revolution or cyber-physical transformation of manufacturing (Industry 4.0). It has enabled the creation of smart factories and digital manufacturing that is more efficient and sustainable [6]. Similarly, agriculture is leveraging advanced technology – including big data, the cloud, and the Internet of Things (IoT) – to track, monitor, automate, and analyze operations. Smart Agriculture has helped to address the declining agricultural workforce and the need to enhance farm yield [7].

Finally, the circular economy, a production and consumption model involving sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible to extend their life cycle, has become a cornerstone of a sustainable economy. The EU has set ambitious goals demanding additional measures to achieve a carbon-neutral, environmentally sustainable, toxic-free, and fully circular economy by 2050, which creates a demand for new approaches to product design across all economic sectors [8].

How can cities boost Smart Economy?

The shift to Smart Economy demands cities to think about how they can support their residents to take advantage of the new economic opportunities and gain competitive advantage for local businesses. Some cities, e.g., Munich (Germany) and Barcelona (Spain), have set up initiatives to address the shortage of digital skills in the job market and provide new career opportunities for their residents. Munich launched ReDI School, offering advanced coding and computer courses for refugees and anyone else in the city without access to digital education. In five years, it has trained 1,600 people and offered more than 120 courses. Similarly, Barcelona opened the IT Academy. It has trained over 1,500 students and 81% of those who completed the course have got a job within six months of their final exam. Barcelona also succeeded in changing the minds of local businesses about reskilling and upskilling the local workforce in a comparatively short time.
It shows that cities investing in people can have a direct impact on the local economic development, especially if it's done in an inclusive and strategic way.

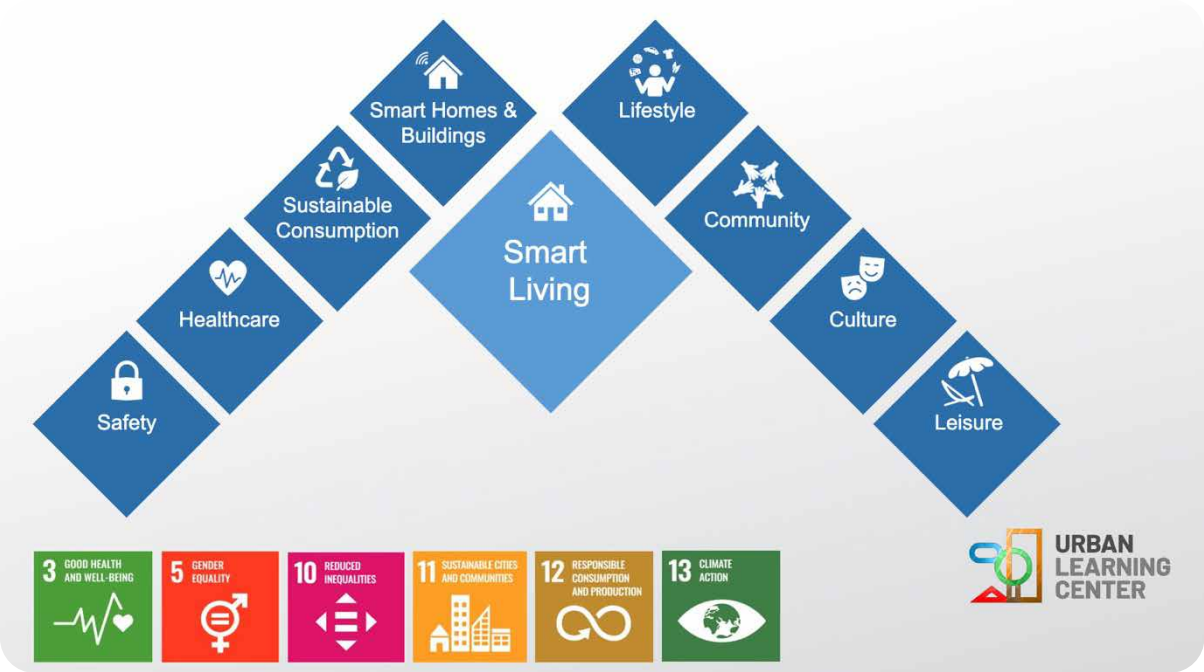
3.5.4 Smart Governance

Smart Governance is a cornerstone for smarter and inclusive city development. We have extensively discussed the enablers, challenges, and key conditions of Smarter Governance in the previous module. Therefore, we just briefly revisit the main aspects of Smarter Governance that are relevant to consider when developing Smarter and Inclusive City strategies:

- Inclusive and accessible digital public service delivery;
- Setting up data Governance standards and procedures;
- Stakeholder engagement in urban planning and decision-making;
- Building of multi-actor partnerships for smart and inclusive city development;
- Capacity building of the city staff.

3.5.5 Smart Living

In many ways, Smart Living connects and enables all the previously discussed action themes of smarter and inclusive city. It focuses on ensuring an adequate quality of life for all citizens and communities while addressing the environmental, economic, and social challenges of our times.



Although Smart Living is often associated with smart homes, it is only one aspect of daily urban life that can be enhanced using smart solutions. Smart Living is also about sustainable consumption and lifestyle, inclusive and accessible public spaces, healthcare solutions, and safety, all key aspects of quality of life.

For example, with people worldwide living longer, there is an increasing number of older citizens requiring support in maintaining their health and overall quality of life.

Some cities have turned to digital solutions to provide safe living spaces and adequate healthcare services for their older population. Singapore has introduced the **Elderly Monitoring System** to improve the daily living, well-being, and safety of elderly citizens, especially if they are living alone. Similarly, Oslo has pioneered healthcare technology that includes digital monitoring devices and remote patient monitoring, allowing people to feel safe and empowered while living independently at old age.

Read more about the **Elderly Monitoring System** here

Read more about the pioneered **healthcare technology in Oslo** here

These solutions demonstrate how we can make use of smart technologies in supporting vulnerable groups of society.

Cities are also places of diverse cultural and leisure options. Therefore, Smart Living cannot overlook how digital solutions can enhance and transform these experiences. Moreover, the advancements of ICTs have enhanced and enabled new forms of community-building that have facilitated the emergence of different urban movements and community life.

Additional reading: **Cities Alive – Designing Cities that work for women**

3.5.6 Smart Society

'Smart Society is at the center of smart and inclusive city development. In the first module, we discussed the importance of a people-centered approach to urban development which can be achieved through digital inclusion, education, and capacity building for its citizens. In return, it should enable creativity and active citizenship, allowing citizens to innovate and engage with all domains of city life. Ultimately, 'Smart Society, together with the city and other stakeholders, should work together to improve their well-being and quality of life.

Cities can boost active citizenship and creativity in joint problem-solving by creating new spaces and mechanisms for facilitating bottom-up initiatives. For example, Athens (Greece) launched social innovation platform SynAthina in 2013. Through this platform, citizens and community groups can submit innovative ideas for making their city a better place to live in. They are then connected to the relevant stakeholders that can support their efforts. You can visit the platform here.

Platforms like SynAthina empower people to take on leadership roles in their communities or neighbourhoods. Facilitating such empowerment allows municipalities to build trust and connections with their citizens in working together for a better and smarter urban future.

Read more about the **SynAthina initiative** here

Visit the **SynAthina platform** here

3.6 Reflection activity

Based on what you've learned about the action themes for smarter and inclusive cities, how could you incorporate them in your city strategies or plans?

Try to answer the following questions:

- What themes or urban challenges is your city addressing through a long-term strategy or plan?
- Which of these themes or challenges could incorporate smarter and inclusive city solutions?
- Based on your experience, what is essential when planning a smart and inclusive city initiative?
- Does your city / municipality have a "Smart City Strategy"?
- Is there a plan to develop one? Are there steps that you can do today to help your municipality develop one in the future?

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Module 4

Smarter and Inclusive Cities Projects and Pilots

Module 4

Smarter and Inclusive Cities Projects and Pilots

4.1 What this module will cover

This module introduces and explains the mechanisms and approaches for developing locally adapted and people-centered solutions. In addition, it introduces an experimental and open way how cities can test novel ideas to face urban challenges.

Learning Objectives:
On completion of the module, participants will be able to:

• Understand the importance of testing, piloting, upscaling, and replicating solutions.

4.2 Living Labs, Piloting and Upscaling

Urban challenges faced by cities are manifold as well as are the potential innovative and smart solutions. Some questions still remain:

• How to make these solutions available and applicable for all kinds of cities, even for the very small ones?
• How to match the cities with suitable smart solutions, focusing on the actual issues that the local urban societies are facing?

Through the development of initiatives for smarter and more inclusive cities, there are several approaches that could be used to support the testing and piloting of solutions.

One potential path could be found in smart city idea competitions, an approach for innovation generation that has been widely practiced at least for the last ten years.

SMART CITY IDEA COMPETITIONS

Smart city idea competitions can be considered as a contribution to the **challenge-based innovation** process in a bottom-up approach. One of the benefits of idea competitions is that this kind of innovation initiative creates a **collaboration platform for involving different local stakeholders**. Important to note is that these processes need to ensure that women, people with disabilities, minorities, etc., are encouraged to participate and involved in all phases of the process. Thus, this involvement raises the potential positive impact on the local inhabitant's life quality by crowdsourcing smart solutions for the most pressing local urban challenges.

Another potential benefit of using the smart city idea competition approach as an innovation initiative is the openness of the idea competition format. Smart city idea competition can inspire a response from a variety of important stakeholders like local residents, researchers, companies, and others who have been already developing different digital tools and solutions.

INCENTIVES FOR A BROAD PARTICIPATION

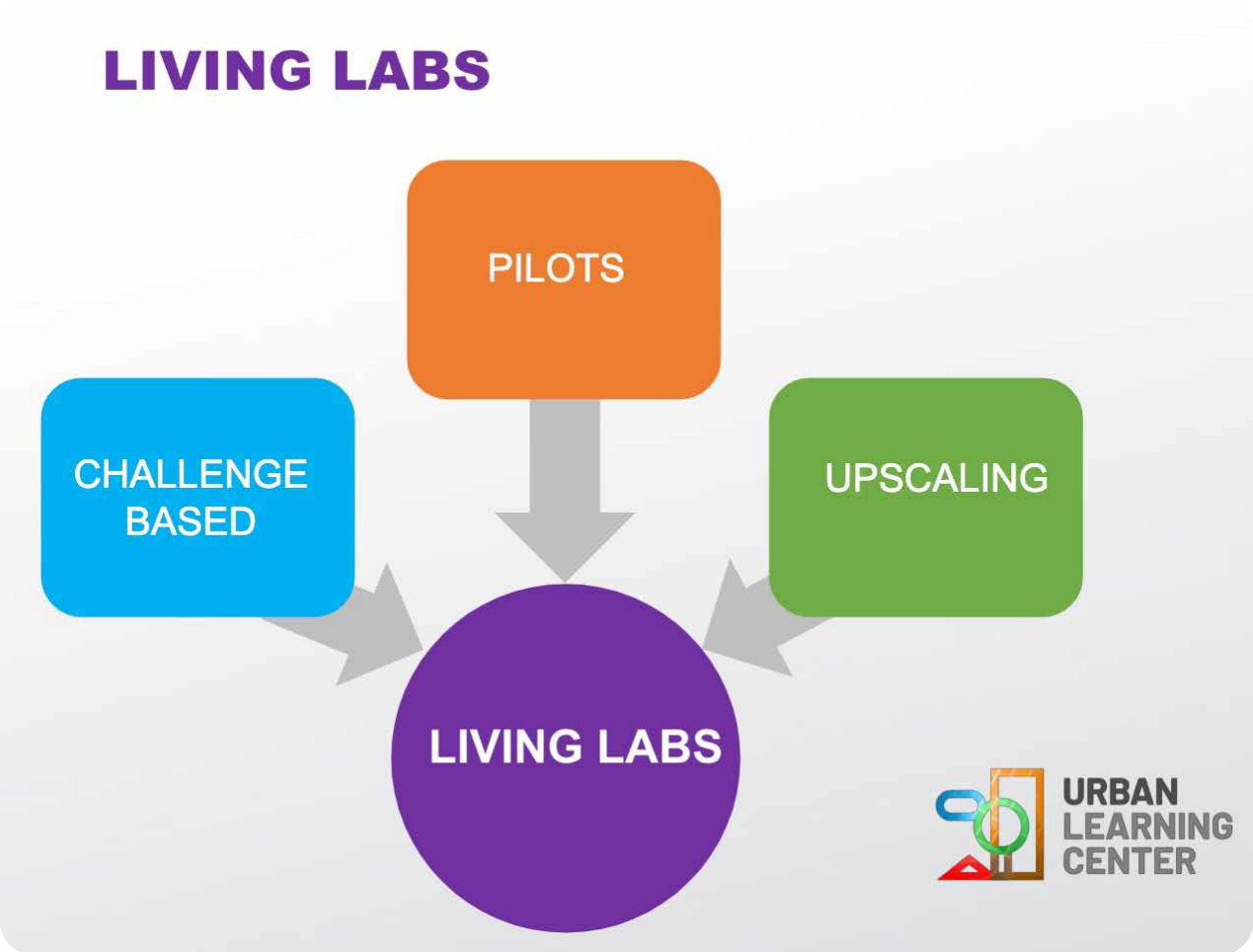
One incentive for broad participation in the smart city competition is the possibility to learn from and collaborate with various stakeholders, including municipalities at the center, and test the innovative ideas and technologies in a real city context. On the downside, the subsequent application of the winning ideas, the actual piloting activities, is a complex process to set up and implement.

LIVING LAB AS A WAY TO FIND SOLUTIONS FOR URBAN CHALLENGES

What is a living lab? "A living lab is a physical or virtual space in which to solve societal challenges, especially for urban areas, by bringing together various stakeholders for collaboration and collective ideation." [1]

Typically, a roll-out of novel ideas into actual urban services and products is a long and expensive process from a local government perspective. In this module, we will introduce a concept on how to set up ways to experiment and pilot ideas through living labs.

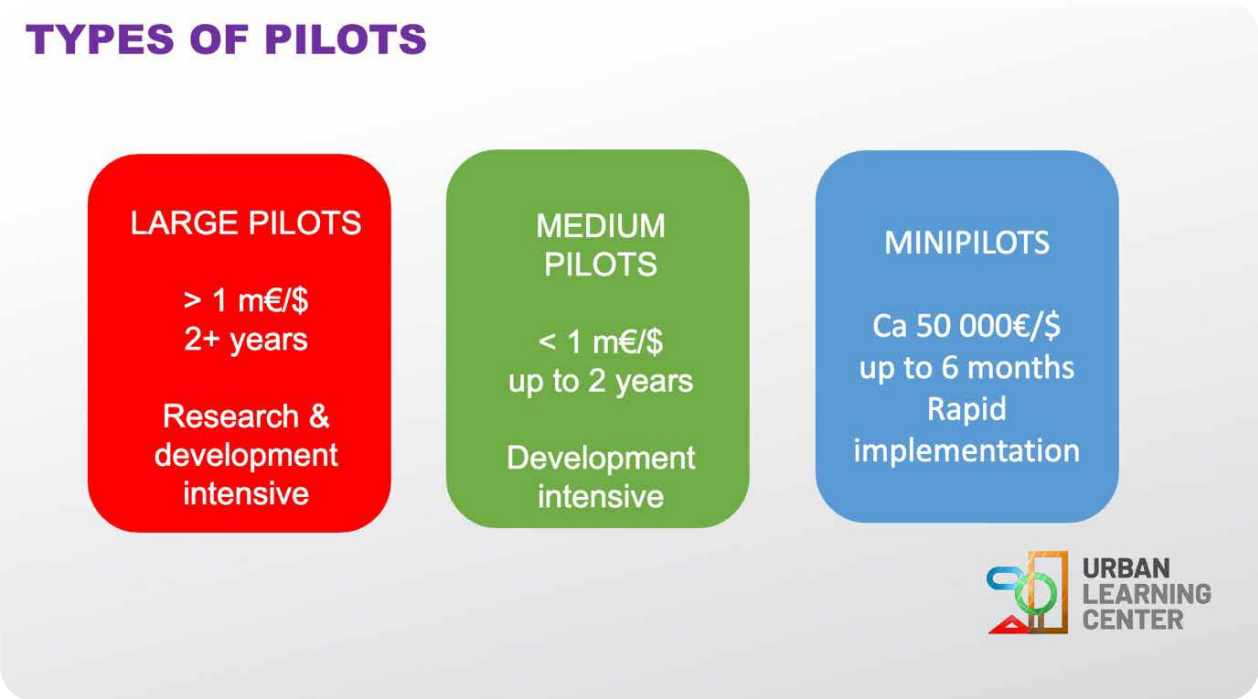
Living labs can help to identify urban challenges, conduct pilots and upscale successful solutions.



4.2.1 City Pilots

Urban transitions can be a rather complex and expensive process. For example, it has been estimated that making one mid-sized European city (100,000 inhabitants) smart and climate-neutral, is rather ambitious due to changes expected in urban infrastructure and behavior of citizens. Furthermore, it is also expensive – the price tag for climate neutrality has been estimated to be around 1 billion euros for a typical mid-sized European city.

Therefore, in a dynamic and complex setup (without perfect information, during something for the first time, using complex ICT technology), cities can start solving their challenges on a smaller scale, via **piloting novel solutions**.



A pilot can start as a mini-pilot with rapid implementation and moderate cost (one mini-pilot is around 15,000 – 20,000€ with implementation in a couple of months). Several cities (e.g. Helsinki) have included this into their innovation ecosystem and use this as a format to collaborate with startups and SMEs.

However, in a typical city environment, most challenges are not solvable via rapid implementation. Sometimes, actual development is assumed for the piloting phase that makes the process more expensive and longer. Furthermore, in the case of very limited knowledge, there might be a need to recruit researchers who adds to the cost and length of the pilot. Pilots can also involve more than one city.

PILOTING PROCESS

If a city has not participated in innovation pilots before, it makes sense to start with a mini-piloting programme.

In general, mini-pilots are suggested to be executed in the following way:

1) Plan a programme with 2-3 mini-pilots. In this way, the programme can reach out to more participants interested in testing out their solutions in a partnership with a city. Minipilots' programme typically cost around 50,000 EUR and is implemented quickly (up to 6 months), and the programme needs proper facilitation too.

2) Definition of urban challenges. Mini-pilots are best designed when they are problem-based and related to the design of urban policies. When designing mini-pilots it is important to conduct a gender analysis to identify issues and barriers experienced differently by different genders and prioritize solutions that are gender-responsive. The addressed problems can be either narrow (e.g. there are too many heavy goods vehicles in front of the main train station) or broad (climate change affects urban living globally). It would also be good to indicate the expected impacts of mini-pilots.

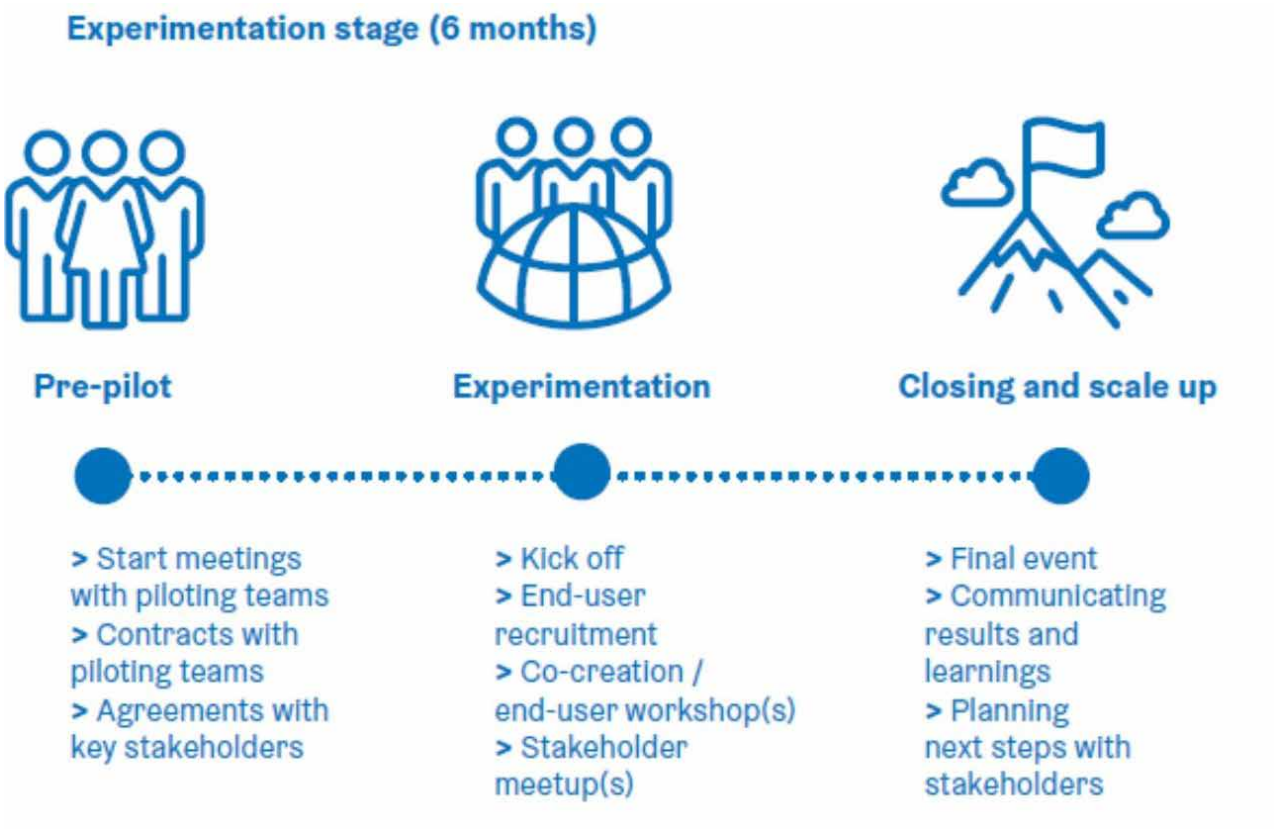
3) Call for Mini-pilots. When mini-pilots are procured in an open call, a very important step is to minimize the administrative burden as much as possible. For example, many cities in Europe can procure solutions up to 20,000 EUR with simplified procurement model, without the need for a complicated formal procurement process. It is also wise to launch this call for mini-pilots with the involvement of relevant stakeholder networks.

4) Selection Process. A call for mini-pilots is expected to raise competition among ideas. Preferably, an Evaluation Committee is set up where each member (e.g. a civil servant, a researcher, a corporate representative) evaluates each proposal according to the evaluation criteria and later a consensus meeting is followed to confirm the ranking of mini-pilots.

5) Experimentation. After winners are announced, implementing teams usually receive up to 6 months to run their pilots. In some cases, there might be expected support needed from the participating city in terms of infrastructure or permits.

6) Lessons Learnt. This step is important to analyze which ideas can have the potential to be scaled up later as larger pilots or even as a new urban service – mini-pilot concept authors are more motivated to participate in this process if they can later scale up their ideas.

Mini-pilots example process:



4.2.2 Mapping local urban challenges

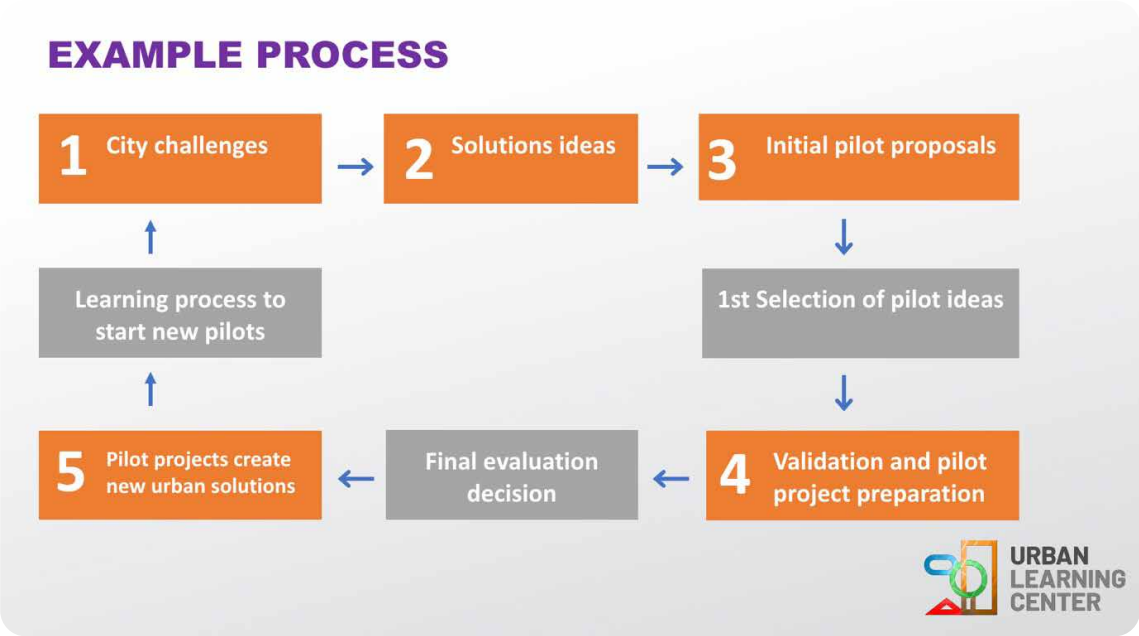
It is important to start the process with the mapping of the local urban challenges, and constantly learn from the process, in particular when referring to medium and large-scale pilots.

The identification of local urban challenges (local needs) should be done prior to the open idea competition. This mapping can be done via **surveys, interviews, workshops and gender/ intersectional analysis.**

1) Those mapped challenges (can be ranked or prioritized) can be made open to the public with the ideation stage – everybody can offer their solution ideas. This type of crowdsourcing allows "the most creative ideas to pop up."

2) Next, it is important to do a reality check and develop those creative ideas into actual project plans. This means – planning the resources, including people and equipment, and estimating the time and funding required. After the first evaluation, pilot teams can develop their plans further, based on feedback.

3) Lastly, after kick-off, pilots usually last 2-3 years.



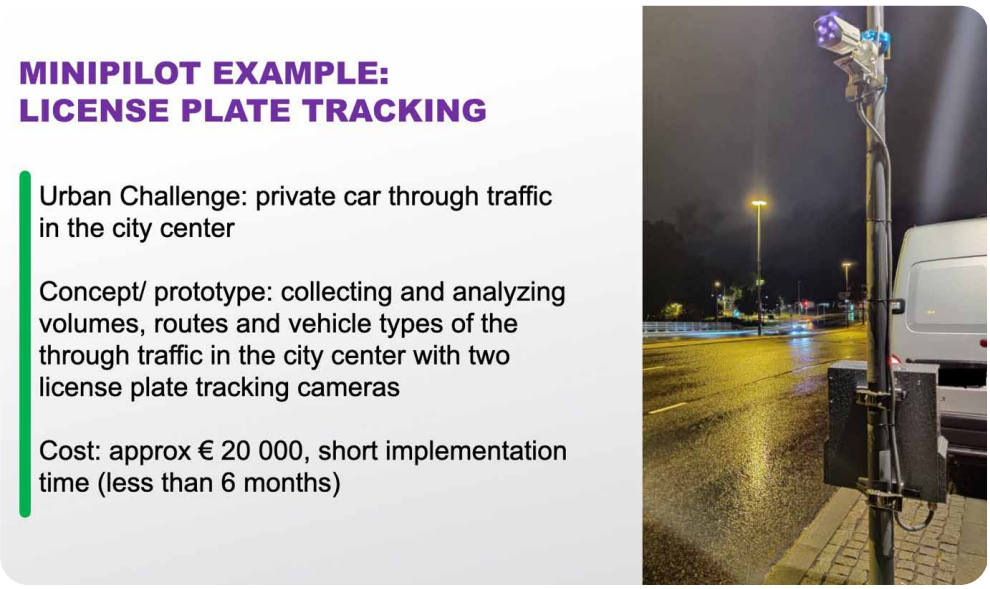
4.2.3 Inspirational case studies – piloting

EXAMPLE OF MINI-PILOT: CITY OF TURKU

In the example case of mini-pilot, the city of Turku wanted to decrease the through traffic in the city center. This was achieved via traffic analysis with registration plate identification technology (cameras) surveying the number of vehicles, the volume of through traffic and other key parameters.

Key details:

- **Urban Challenge:** Private car traffic in the city center and different aspects related to it.
- **Concept/ prototype:** Through traffic study via collecting and analyzing volumes, routes and vehicle types of the through traffic in the city center.
- **Duration:** a pprox.. 3 weeks, cost around 20,000 EUR.
- **Partners:** Nodeon (company).
- **Enablers:** new technology to be tested, demand for data. Reorganization of traffic arrangements.
- **Value generated:** support decision-making, promote sustainable modes of traffic.



EXAMPLE OF MEDIUM PILOT: WELL-BEING SCORE IN NARVA, ESTONIA

As an example of the medium pilot, the Well-being Score (WBS) project aims to bridge the gap between urban planners and urban residents by developing a well-being score. This score is an innovative method and tool integrating quantitative physiological and subjective psychological indicators. The purpose is to assess environments that are not only safe and convenient, but also interesting or pleasant or vice versa aiming to identify environments that are unsafe, stressful, overstimulating, or unattractive.

The result is a visualization of WBS and related parameters as map layers including guidelines for interpretation and use in city planning workflow. The WBS can also be used as an input for solving climate challenges in city planning. Increased well-being in the city, e.g., better human-environment relations, in turn, creates an overall spill-over effect contributing to secure and mentally, physically, socially, economically healthier city.

The city of Narva is the project pilot partner where the WBS will serve as an additional input for making decisions about the improvements in their living districts to find new options for keeping and attracting citizens and investments.

MEDIUM PILOT EXAMPLE: WELL-BEING SCORE

Challenge: some places are not attractive for residents in the city

- A data-based tool to plan and measure the effect on well-being of a specific development project – before and after combining:
  - Spatial parameters
  - Psychological questionnaires
  - Physiological signals
- Cost: ca 0.5 m€, pilots runs for 1-2 years

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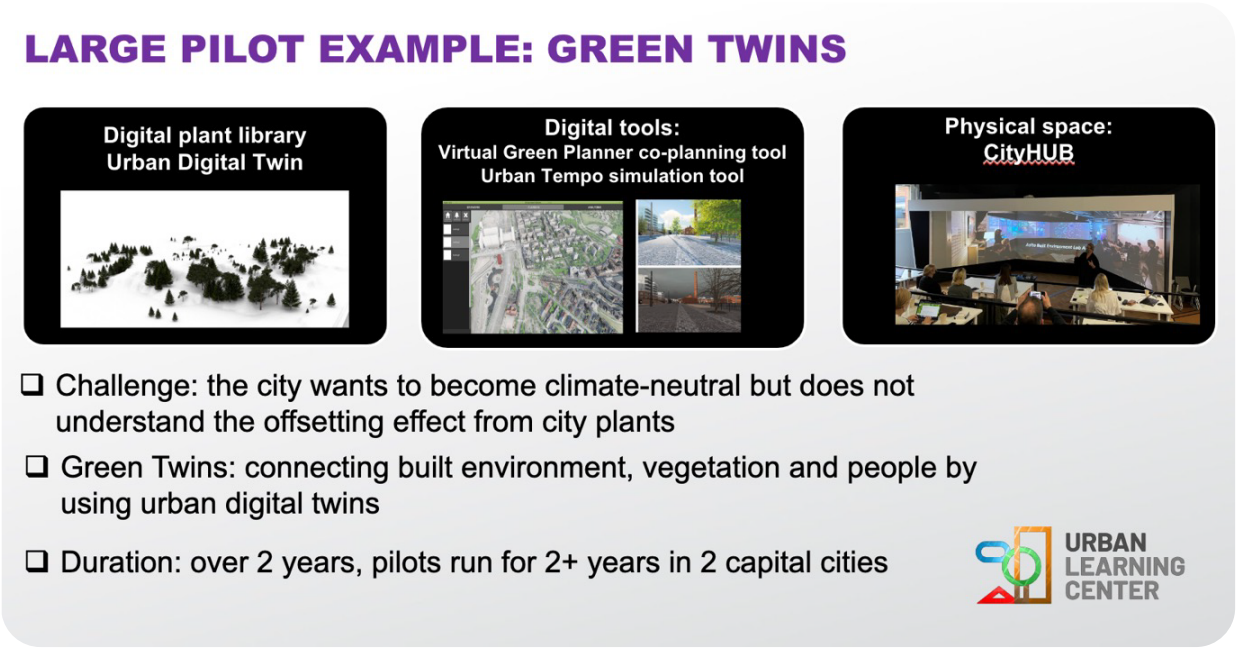
Learn more about the **Well-Being initiative** in Narva through the video below:

EXAMPLE OF A LARGE PILOT: GREEN TWINS

As an example of the large pilot, the Green Twins pilot focuses on digital twins for the green urban areas of two different capital cities of Tallinn and Helsinki. Broadly, the digital green twins aim to estimate the effect of carbon offsetting in the urban environment (more greenery, cleaner air; less greenery, poorer air) in a dynamic and participatory way (trees, bushes, etc. change in time; citizens can have better visualization of future plans).

The world-class novelty of the project is the dynamic digital modelling of the green environment, a "green information model". Today, 'the green environment' is represented by static images. In reality, the green environment is in constant temporal change, which has a major impact on urban comfort and the carbon balance of a city and is a primary quality factor of the urban environment. It has a major impact on micro-climate and particle emissions, heat island effect and soundscape and is one of the measures for climate adaptation. Green environments create an identity for cities and can offset greenhouse gas emissions towards carbon neutrality.

This pilot develops a 3D plant library with specific digital tools (Virtual Green Planner and Urban Tempo Application Simulation). The permanent Smart CityHUB in downtown Tallinn promotes the digital advance of the city and facilitate citizen participation in urban planning and co-design initiatives.



GREENTWINS DIGITAL SOLUTIONS FOR PLANNING CITY GREENERY:
a. Urban areas are growing quicker than traditional environment planning solutions can keep up with. The complex and ever-evolving ecological networks, where vegetation plays a foundational role, undergo changes at such a rapid pace that they often elude human perception.

b. Analytical and forecasting methods, which are still commonly reliant on human observation and manual processes, struggle to keep up with the pace of these changes. The planning of urban environments has moved into using digital planning systems, and more recently in creating digital twins of the urban environments.

Watch the video below to learn more about the **GreenTwins digital solutions**:

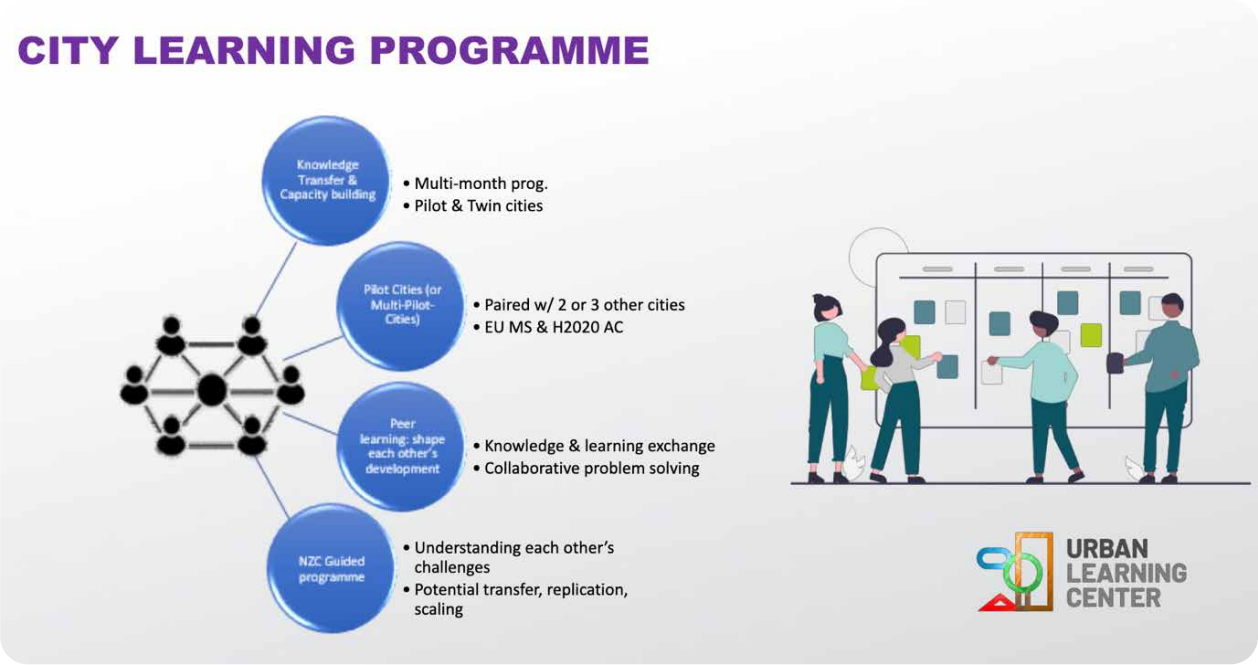
4.2.4 City Learning Programmes and Smart City Challenges

In specifics, the City Learning Programme is a multi-month programme that aims to transfer knowledge and build capacities across Pilot and Twin Cities. At its core stands the strategy of impact through peer learning: two or more learners with a similar background which allows them to actively shape each other's development through knowledge exchange and collaborative problem-solving. Each Pilot City (or in the case of a multi-city application, the group of cities) will be paired with two or three Twins from across EU member states and (H2020) Associated Countries.

Those Twins will be cities with a similar background as the Pilot Cities and might face similar challenges. These could be based on geography, national context, socio-economic or similar.

Net Zero Cities will guide those cities through a series of online and in-person meetings, aiming to create a clear understanding of each other's challenges and exchange or generate potential solutions.

Potential opportunities for transfer/replication across a diverse group of EU and H2020 Associated Country cities.



OTHER EXAMPLES OF PILOTING PROGRAMMES

The piloting programmes can also be international and across different continents.

For example, in November 2021, the UN-Habitat and Sweden launched a piloting programme for four cities in UK (Bristol), Brazil (Curitiba), Uganda (Makindye Ssabagabo) and Columbia (Bogota).

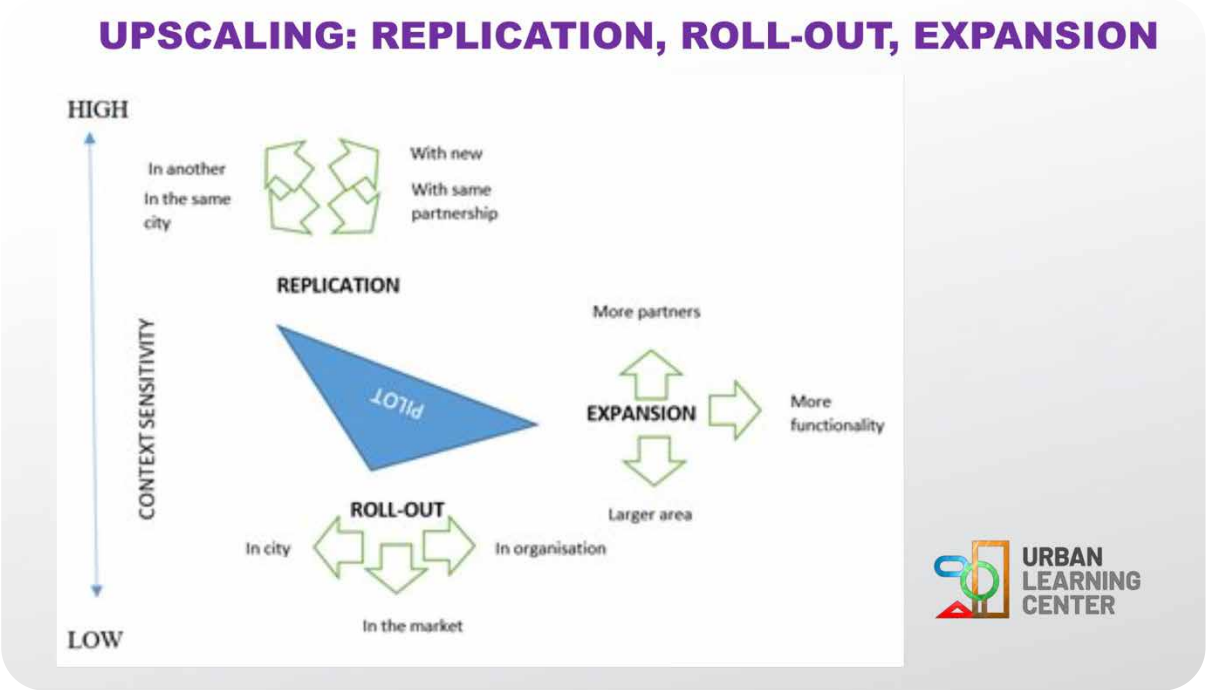
Read more here about the **Four cities invited for the climate smart cities challenge** | UN-Habitat (unhabitat.org)

Read more about the **Bogotá - Climate Smart Cities**

Learn more about the **Bogota Challenge** through the video below:

4.2.5 Upscaling: Roll-out, Expansion, Replication

The World Bank defines **upscaling** as "expanding, adapting, and sustaining successful policies, programmes, or projects in different places and over time to reach a greater number of people" [2].



Upscaling has three different types [3, 4]:

• **Roll-out:** the diffusion is considered rather **spontaneous** triggered by the spread of good practices, which does not require any significant changes (e.g. new partnerships).

• **Expansion:** involves scaling up within the organization that develops it, and it can involve larger geographic area, recruitment of new partners or addition of novel functions. Compared to the roll-out, expansion is usually more complex and usually involves some form of co-production with coordination of several stakeholders.

• **Replication:** is the third and most complex scaleup type. It aims to **reproduce the pilot in a different context, such as a new city or part of a city**. Furthermore, replication can entail the initial or new partnership; and it can occur as a proxy or exact replication of the initial pilot project. Usually, the process of replication has to deal with a new context with different regulations and partners which is the reason why there is usually no identical replica of the initial pilot.

Key Messages:

To conclude, innovation in cities is a complex and non-linear process.

To understand novel technologies and solve complex ("wicked") problems, it might be wise to test ideas as agile pilots and then scale up, if successful via challenge-based competitions. However, if a pilot is not successful, it can be also a cost-efficient learning process.
In the case of higher level of uncertainty, applying the Living Labs concept can help managing the process. Living Labs can be run also in a participatory way, via involvement of residents and it is suggested to localize and map urban challenges.

Living Labs help to solve complex urban challenges in a more agile and cost-effective way.

- If the pilot works – it is possible to scale it up
- If the pilot does not work – it's 'limited funding lost

Please remember: It is important to map local urban challenges and city needs in a systematic way!

4.3 Activity: Brainstorming a smart and inclusive city pilot

Please brainstorm one potential Smart and Inclusive City pilot that could be tested in your municipality:

1. Name of the pilot:
2. Urban challenge to be addressed (one sentence):
3. Brief description of the pilot (ca. 3 sentences):
4. Potential budget:
5. Please describe a project team that executes this pilot (optional):
6. What are the tasks and deliverables, and their schedule? (optional)

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Module 5

Smarter Implementation, and Monitoring

Module 5

Smarter Implementation, and Monitoring

5.1 What this module will cover

This module focuses on the implementation, adoption, monitoring, and assessment of smarter and inclusive cities. It outlines key implementation challenges of such projects, it explains the agile approach to smarter and inclusive city implementation, it highlights the importance of monitoring and assessment for smarter city development, explains the process of selecting and designing different types of indicators and introduces some examples.

Learning Objectives:
On completion of the module, participants will be able to:

- Recognize key implementation challenges;

- Understand the agile approach for project management;

- Know different categories, themes and types of indicators related to smarter and inclusive development;

- Understand the importance of monitoring and assessment for smarter and inclusive city development.

5.2 What are the key implementation challenges of smarter and inclusive city initiatives?

We would like to kick off this section by posing the following question: **Based on your experiences in your municipality, which main implementation challenges have you faced with innovation and smarter city projects?**

Implementation of smarter and inclusive city projects and initiatives differs from typical city development projects with their inherently **interdisciplinary character** stemming from the need to combine digital solutions with existing city services, infrastructure, and working practices.

As a result, cities tend to run into different implementation challenges, for example [1]:

• Lack of suitable physical or IT infrastructure that is scalable and adaptable to new technologies and growing needs;

• Lack of transparency and data privacy when collecting and analyzing personal information;
• Lack of implementation capacity, including lack of funding, skilled personnel, data processing capacity, and others;

• Political differences and lack of support on the decision-making level hinder implementation, especially for long-term projects that extend beyond one political cycle;

• Insufficient coordination and collaboration between public and private sectors that often have different working styles and priorities;

• Limited digital literacy among end-users, restricting the ability of residents to use new solutions;

• Short-term mindsets or outlooks of residents and other stakeholders, limiting the possibilities of sustaining long-term initiatives;

• Lack of communication about Smarter and Inclusive City initiatives and lack of buy-in by the public;

• Overlooking social inclusivity results in solutions fit for a few, not all user groups.

5.3 Agile approach to smarter and inclusive city implementation

The implementation of smarter and inclusive city solutions can also benefit from a more agile approach to project management. This type of approach has originated with software development in the private sector!

Unlike the comparatively linear implementation process of typical city development projects, the agile approach is iterative and usually broken down into smaller cycles (sprints or iterations). It enables responding to issues or feedback more quickly and timely. And consequently, it could support the development of better solutions [2].

The agile approach involves constant stakeholder collaboration and continuous improvement at every stage. There are five main stages:

1. Define requirements and expectations based on analysis of the problem to be solved and diverse stakeholder needs;

2. Plan iterations or sprints (implementation phases) in line with available resources and capacities;

3. Co-design the solution by involving the end-users and responding to their feedback;

4. Develop and implement the solution through iterations or sprints, collecting feedback on testing and improving the solution from one delivery cycle to the next;

5. Review and monitor key metrics against the requirements and adapt as needed.

These stages are not linear but iterative as the implementation process continuously repeats several, if not all stages and enables adjustments when needed.

Moreover, implementing smarter and inclusive city initiatives rarely stops with the deployment of a final solution. Both technologies and user needs are constantly evolving and changing, requiring continuous improvement of developed solutions, or they risk becoming outdated or inefficient. Smarter and more inclusive cities is a process – not an end itself.

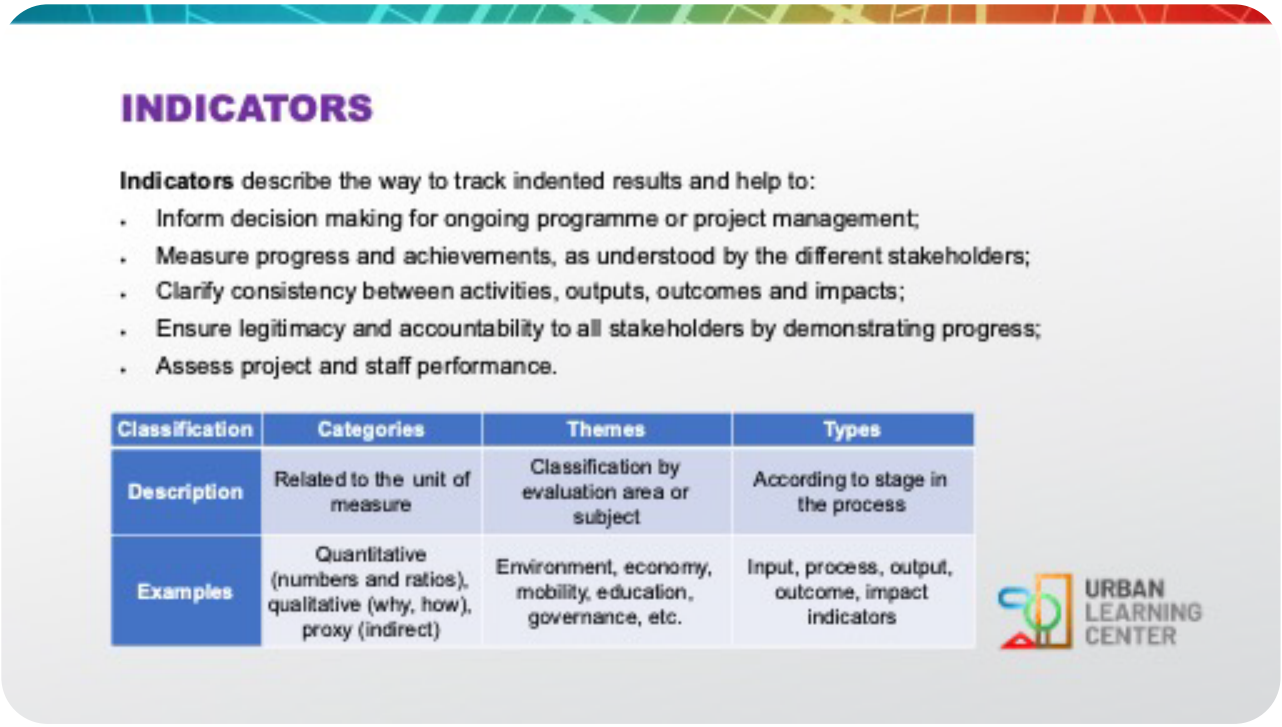
Some cities have already embraced a more agile approach for smarter and inclusive city development.

For example, the city of Helsinki (Finland) has established an innovation company, Forum Virium Helsinki, whose main task is to co-create urban futures with companies, universities, the public sector, and residents. Their approach is based on implementing agile pilots – small and mission-oriented projects that can be carried out quickly (from less than a month to half a year) and be used to bring an unfinished product or service for testing with real users as early as possible.

The agile approach foresees several rounds of real-life trials (and failures) and co-creation with users and other stakeholders before a wider roll-out of the product or service. Forum Virium Helsinki has a large portfolio of smart solutions, including agile pilots in Smart Kalasatama (a district in Helsinki), which you can read more about **here**.

Trust, flexibility, empowerment, and collaboration are at the core of the agile approach. Such an approach can be difficult to adapt to government-led projects that are more rigid when it comes to adjusting requirements or expectations. Nevertheless, even partial adoption of some of these principles could be useful in shifting how we think about implementing smarter and inclusive city initiatives.

The responsiveness to changes is especially relevant as we live in an increasingly dynamic world where expectations and needs can change quickly. Here, the key role can be played by monitoring and assessing initiatives for continuous improvement.



5.3 Monitoring and Assessment

Monitoring is a periodic task of collecting information from initiatives, projects and programmes while it is ongoing [4].

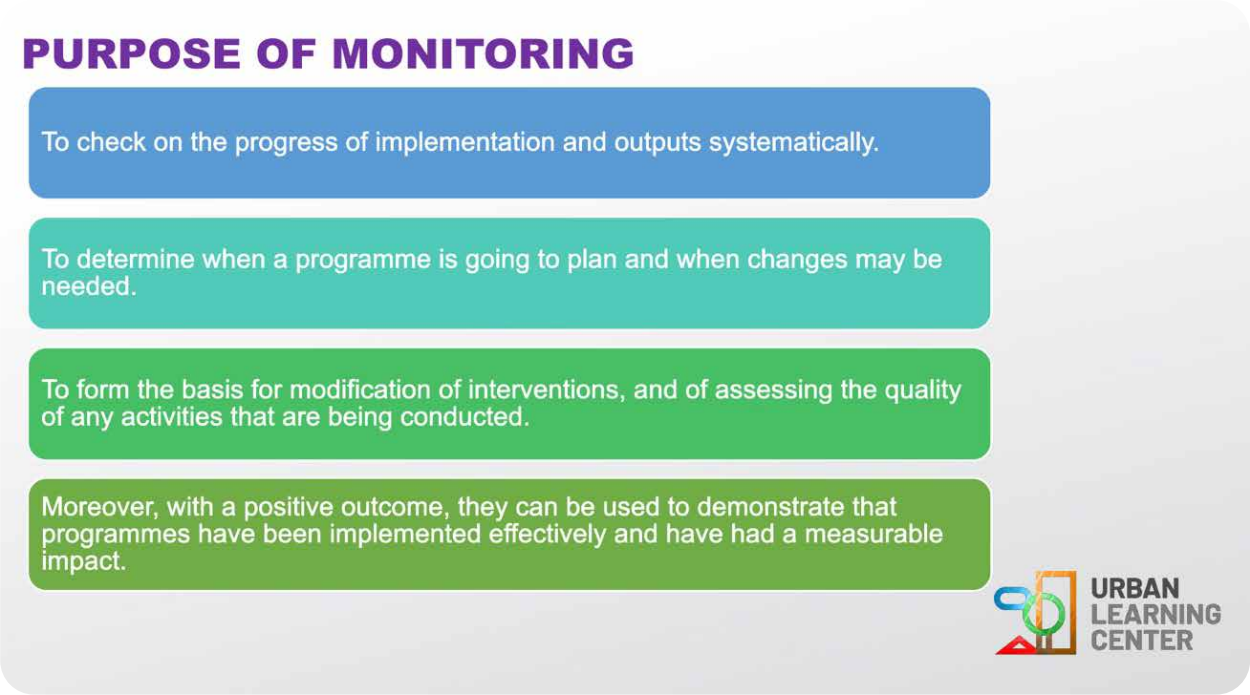
Relatedly, performance monitoring is the continuous process of collecting and analyzing data to verify the progress of a project against expected results [5].

In smarter cities, this is continuously done via feedback loops to assess and guarantee the quality of public services.

Reflection: Does your department monitor and evaluates the performance of the projects being implemented? And do you know what is the main purpose of this practice?

Purpose of Monitoring

The main purpose of monitoring and assessment is to improve the performance of the initiative or project that is being studied [6]. Nevertheless, the practice of monitoring and assessment is useful for many reasons, including to improve internal learning and decision making about project design and implementation. For instance, identifying success factors and which approaches work or do not work; to contribute to the evidence base about effectiveness and limits of projects and initiatives; and to ensure accountability to key stakeholders as community, supporters, the wider movement and funders [4].



Indicators

Indicators are simple and reliable means to measure the progress of a project. City managers need indicators for target setting, monitoring, performance assessment, management, and decision-making [7].

There are different classifications of indicators, as illustrated in the table.

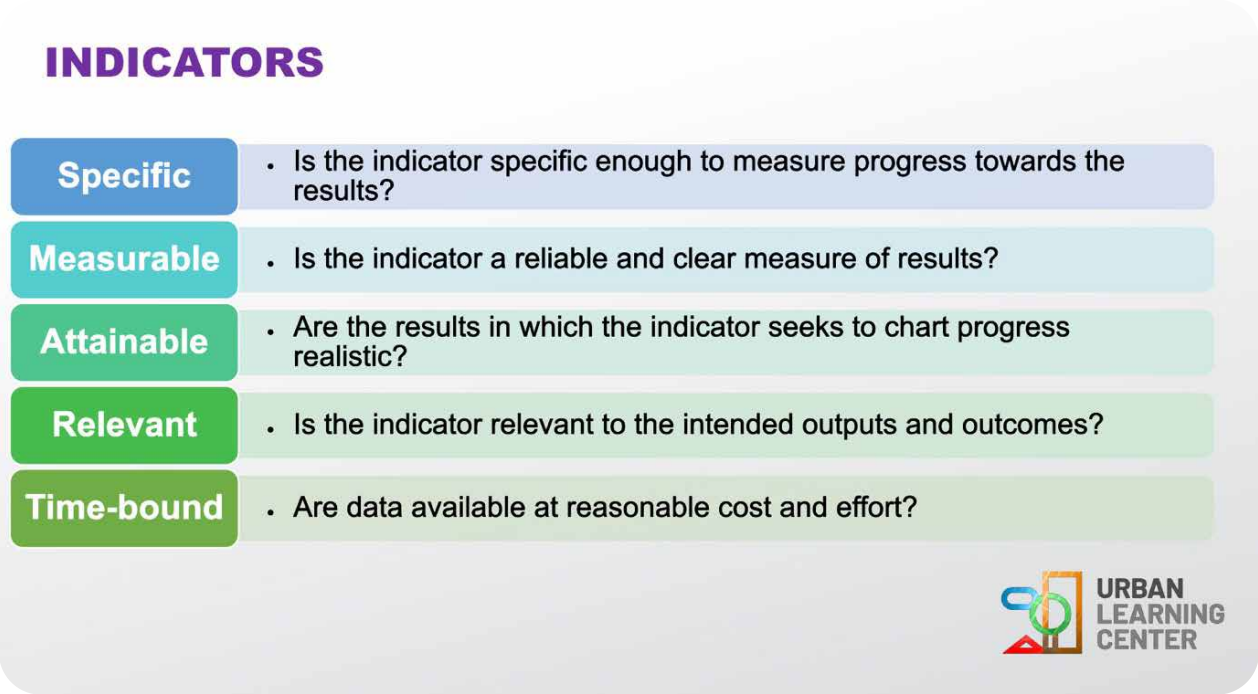
The classification per **category** refers to the unit of measure, which can be:

a. Quantitative: often stated in the form of numbers,

b. Qualitative: addressing questions about ‘why’ and ‘how’, as well as perceptions, changes in satisfaction, quality and so on.

c. Proxy: which are “indirect or symbolic” indicators used when it is difficult to directly measure a result.

Indicators can also be classified by **themes** or evaluation areas. Furthermore, indicators may be used at any point along the results chain, meaning classification by **indicator type** [8].



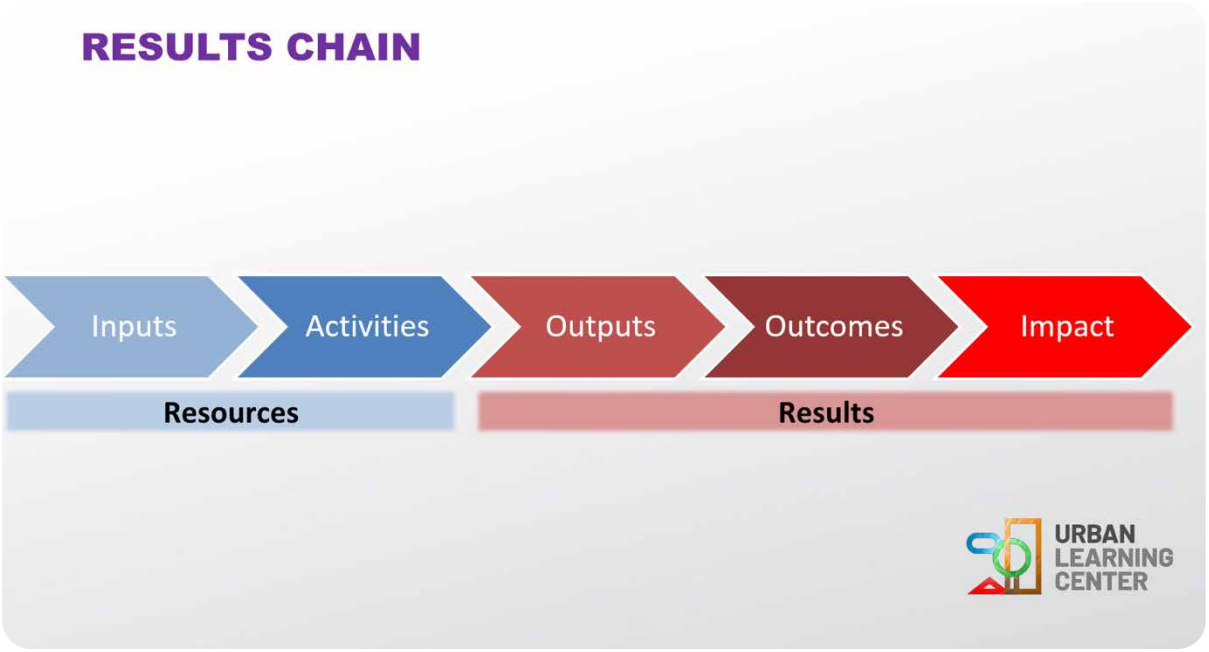
Important points when defining indicators:

• **Who** sets indicators is fundamental, not only to ownership and transparency, but also to the effectiveness of the indicators. Setting objectives and indicators should be a participatory process.
• A **variety** of indicator types is more likely to be effective. The demand for objective verification may mean that focus is given to the quantitative or simplistic at the expense of indicators that are harder to verify but may better capture the essence of the change taking place.
• The fewer the indicators, the better. Measuring change is costly, so use as few indicators as possible. However, there must be indicators in sufficient numbers to measure the breadth of changes happening and to provide cross-checking.

To be able to assess the progress of a project it is necessary to understand the different elements involved in the results chain [2, 5, 8]:

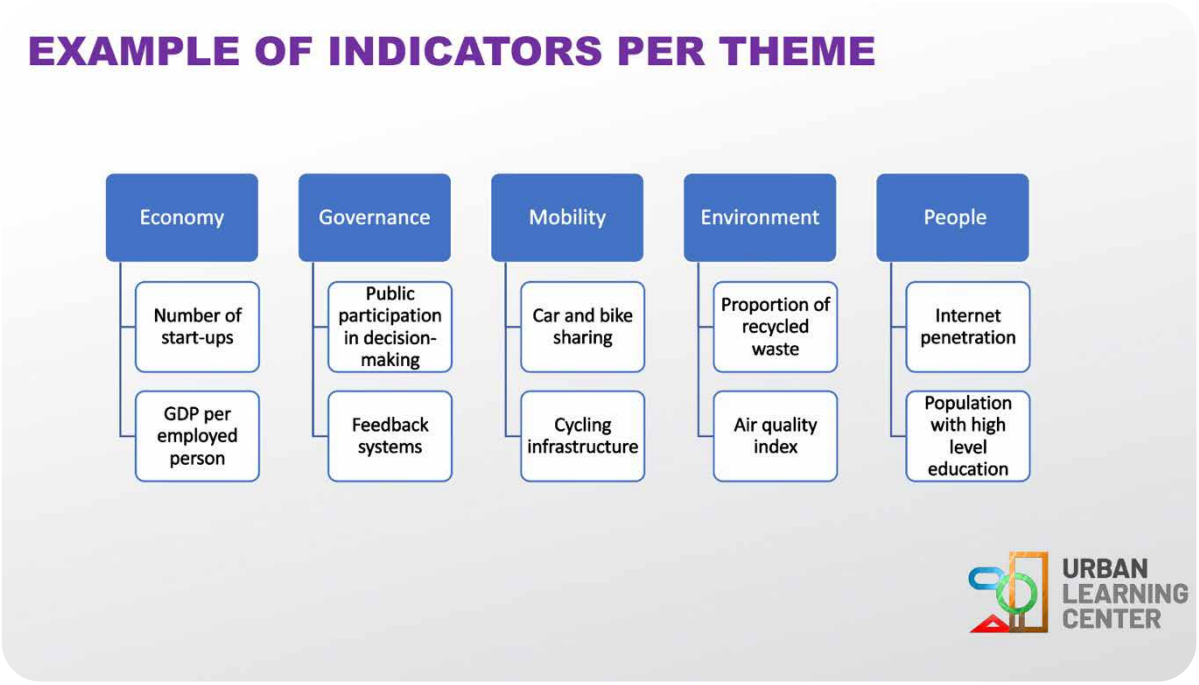
• Any resource that is put into a project to carry out an activity can be considered an input. Examples include units of time, staff, money, equipment, know-how.
• **Activities** are the tasks undertaken to produce outputs.
• **Outputs** are the products, capital goods and services which result from a project. Typically, more than one output is needed to obtain an outcome.
• **Outcomes** are the likely or achieved short-term and medium-term effects of outputs. An outcome should be SMART: Specific, Measurable, Achievable, Relevant and Time-bound.
• Finally, **impacts** are positive, or negative, primary or secondary long-term effects produced by a project, directly or indirectly, intended or unintended.

Inputs and activities are considered resources; whereas outputs, outcomes and impacts are connected to the results of a project.



The definition of KPIs can be done according to the main themes of a city. For instance:

Type of indicator	What is measured?	Type of assessment	When to use?
Input	Resources needed for interventions	Planning	Planning of needed resources to achieve some goal
Process	Implementation of activities	Quality assessment on means of implementation	Evaluation of implementation
Output	Effectiveness of imple-mentation	Short-term monitoring	Reporting on immediate progress of implementation
Outcome	To which extent did the activities reach their objectives?	Mid-term evaluation	Reporting on intermediate results (e.g. adoption rate of urban solutions)
Impact	What was achieved by the interventions?	Long-term evaluation	Reporting on real impacts or overall performance



Here you can see some examples of smart inclusive cities indicators per city action theme. This table explains the typology of indicators according to their stage in the results chain. It shows what is measured by each indicator, the type of assessment and its application [9 and 8].

• **Input indicators** refer to the resources needed for the implementation of an activity, such as financial and human resources.

• **Process indicators** measure whether planned activities took place. Examples in the smart city context include holding meetings and training courses.

• **Output indicators** add more details in relation to the product of the activity, for example the number of workers trained or the production of materials.

• **Outcome indicators** are the result of both the "quantity" ("how many") and the quality ("how well") of the activities implemented. Often, they measure the extent to which the target population has been reached by the project, for instance the percentage of the population using bikes.

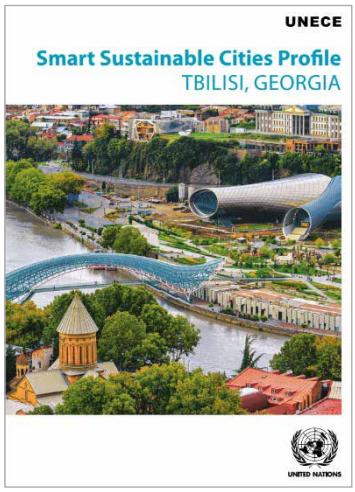
• **Impact indicators** describe the changes in people's lives [8, p.65]. They can be used for measuring the quality and quantity of long-term results generated by outputs, such as: measurable change in quality of life, improved transport system and reduced air pollution.

In sum, the purpose of monitoring and assessment is to track the implementation and to measure projects effectiveness to shed light on areas where action is needed. In addition, you learned that indicators are the most important aspect for the monitoring and assessment process and that different classifications of indicators exists.

5.4 Inspirational Case Study and Examples of Monitoring and Assessment

SMART SUSTAINABLE CITIES PROFILE: TBILISI, GEORGIA

The Smart Sustainable City Profile of Tbilisi aims to showcase the progress of Tbilisi in its transition to becoming a smart and sustainable in the context of SDG 11 and other urban-related SDGs with the overall aim of assisting the city in realizing its ambitious vision of becoming one of the leading smart sustainable cities in the UNECE region. The Profile delivers a comprehensive set of policy recommendations to upscale efforts in the area of urban policy and governance framework; construction and urban infrastructure; and local monitoring and evaluation framework for strategic planning.



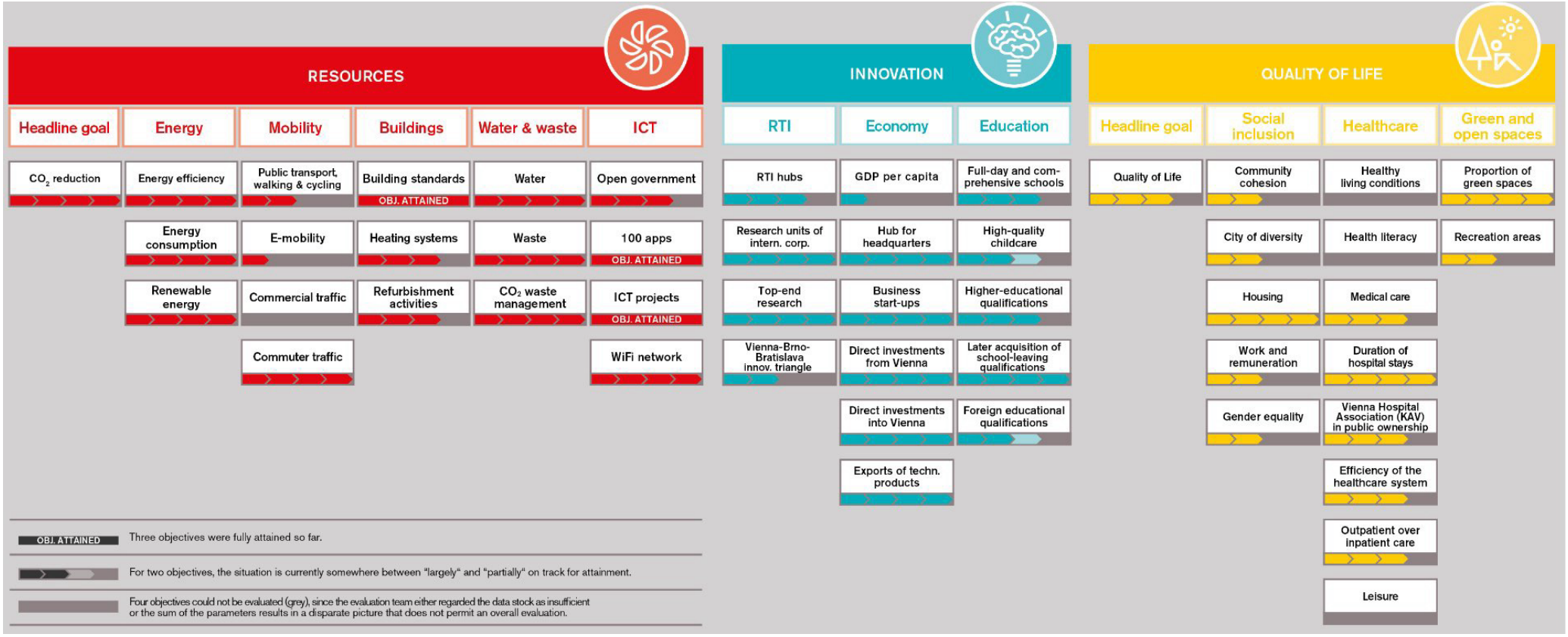
Read more about the **Smart Sustainable Cities Profile: Tbilisi, Georgia** | UNECE

VIENNA'S STRATEGY MONITORING

Smart City Wien carries out regular monitoring to assess the extent to which the goals and objectives of the Framework Strategy have been attained. However, the monitoring process not only serves to evaluate the status quo, but rather to create a platform for enhancing cooperation among all the various stakeholders. Around 120 staff from 50 departments and agencies of the municipal administration and its associated enterprises and agencies were involved in the first monitoring process. A team of experts developed a pre-defined methodology together with indicators to measure the attainment of each strategic objective.

The results of the monitoring and assessment process are published in the form of a Monitoring Report, which is used as a base to update the Smart City Wien Framework Strategy.

Read more about the **Smart City Vienna** here


RESOURCES
Headline goal
Energy
Mobility
Buildings
Water & waste
ICT
CO_2 reduction
Energy efficiency
Public transport, walking & cycling
Building standards
OBJ. ATTAINED
Water
Open government
Energy consumption
E-mobility
Heating systems
Waste
100 apps
OBJ. ATTAINED
Renewable energy
Commercial traffic
Refurbishment activities
CO_2 waste management
ICT projects
OBJ. ATTAINED
Commuter traffic
WiFi network
INNOVATION
RTI
Economy
Education
RTI hubs
GDP per capita
Full-day and comprehensive schools
Research units of intern. corp.
Hub for headquarters
High-quality childcare
Top-end research
Business start-ups
Higher-educational qualifications
Vienna-Brno-Bratislava innov. triangle
Direct investments from Vienna
Later acquisition of school-leaving qualifications
Direct investments into Vienna
Foreign educational qualifications
Exports of techn. products
QUALITY OF LIFE
Headline goal
Social inclusion
Healthcare
Green and open spaces
Quality of Life
Community cohesion
Healthy living conditions
Proportion of green spaces
City of diversity
Health literacy
Recreation areas
Housing
Medical care
Work and remuneration
Duration of hospital stays
Gender equality
Vienna Hospital Association (KAV) in public ownership
Efficiency of the healthcare system
Outpatient over inpatient care
Leisure
OBJ. ATTAINED
Three objectives were fully attained so far.
For two objectives, the situation is currently somewhere between "largely" and "partially" on track for attainment.
Four objectives could not be evaluated (grey), since the evaluation team either regarded the data stock as insufficient or the sum of the parameters results in a disparate picture that does not permit an overall evaluation.

5.5 Test your learning

1.Please indicate if the statement below is True of False and justify your answer.

"Monitoring and Assessment should be left until the end of a project when the final results are known".

Answer: This statement is false. M&A activities should be planned from the start of any project and the M&A process should take place throughout a project so that progress towards goals is measured regularly and any necessary adjustments made to the project implementation.

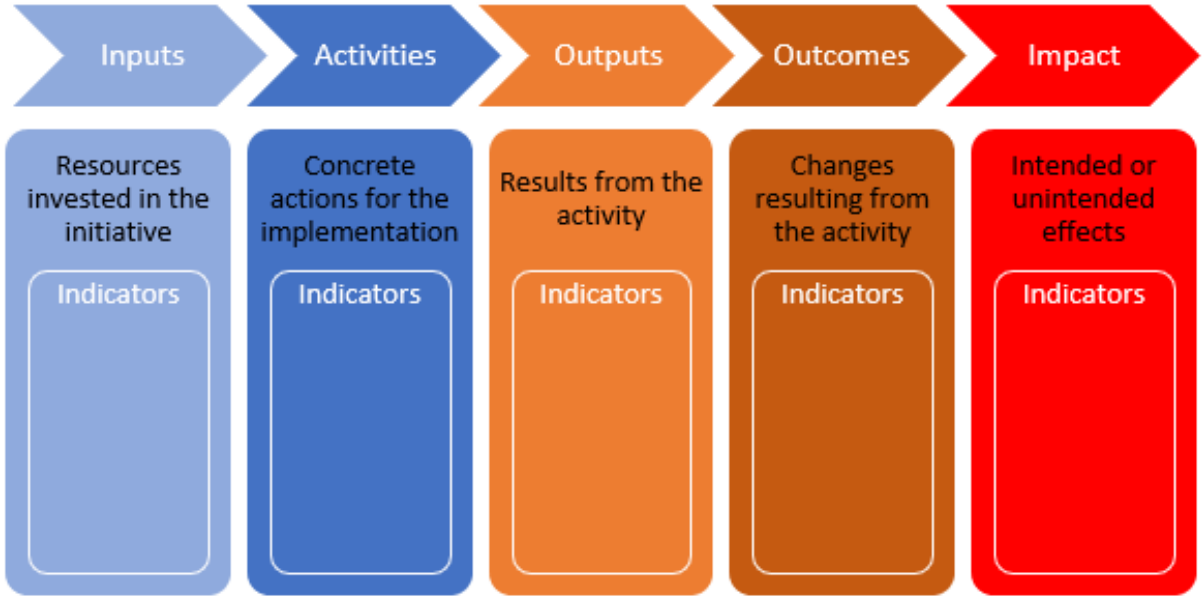
2. Please associate the descriptions below with five of the following terms:

Descriptions	Terms
1) This process aims to understand the progress that has been made towards the achievement of an outcome or an impact at a specific point in time and is linked to outcomes and impact rather than to outputs.	A) Monitoring
2) These are the immediate results of the activities conducted. They are usually expressed in quantities, either in absolute numbers or as a proportion of a population. They are generally expressed separately for each activity.	B) Assessment
3) This is a measure of performance that provides evidence of progress towards a target.	C) Indicator
4) This describes the long-term results expected of a project, and generally refers to its overall goal(s).	D) Result
5) These are the medium-term results of one or several activities. They are what the immediate outputs of the activities are expected to lead to, and they often require separate surveys to be undertaken.	E) Outputs
	F) Outcomes
	G) Impacts

5.6 Activity: Defining indicators for smart and inclusive city projects

First, describe in one sentence an initiative or project that has sough to be smarter and more inclusive.

Please think about one initiative or project and define at least one possible indicator for:



References and additional resources

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• Digital Readiness Assessment Moldova: https://www.undp.org/moldova/publications/digital-readiness-assessment

• E-participation: a quick overview of recent qualitative trends: https://www.un.org/esa/desa/papers/2020/wp163_2020.pdf

• Guidance to structure the project governance and core team (LEDP Course)

• Innovation and digital technology to re-imagine Participatory Budgeting as a tool for building social resilience: https://unhabitat.org/innovation-and-digital-technology-to-re-imagine-participatory-budgeting-as-a-tool-for-building

• Smart Cities Training Series: https://www.undp.org/policy-centre/singapore/smart-cities-training-series

• In the P4EG course many tools for Stakeholder identification are presented. Link to the "The Value of Stakeholder engagement" of the P4EG course.

• Participatory Budgeting: a tool for Inclusive Smart Cities webinar: https://smart-cities-marketplace.ec.europa.eu/sites/default/files/Presentation%20Webinar%20PB.pdf

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• Participatory Tools: Improve & enrich your Stakeholder Engagement Process with 5 easy steps: Participatory.Tools – Stakeholder Participatory.Tools kit

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Additional resources

• Introduction to Monitoring and Assessment of SSC solutions (MOOC video Luiza Schuch de Azambuja): https://youtu.be/NFKi7kDfBYo

• United for Smart Sustainable Cities (U4SSC): https://u4ssc.itu.int/u4ssc-kpi/

• UNECE - Guidelines_for_SSC_City_Action_Plan: https://unece.org/housing-and-land-management/publications/guidelines-development-smart-sustainable-city-action-plan

• A step by step guide to Monitoring and Evaluation, developed as part of the Project 'Monitoring and Evaluation for Sustainable Communities': http://www.geog.ox.ac.uk/research/technologies/projects/monitoringandevaluation.html

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• UNDP. (2009). Handbook on Planning, Monitoring and Evaluating for Development Results. New York, New York, USA. Retrieved from http://web.undp.org/evaluation/handbook/documents/english/pme-handbook.pdf

• Example: Smarter London Together Roadmap 2018–21: Report Back to Mayor of London : https://trello.com/b/CIoKi2mP/smarter-london-together-report-card

https://www.london.gov.uk/sites/default/files/slt_roadmap_summary_paper_for_2021.pdf

• Why do we need KPIS? Video: https://u4ssc.itu.int/u4ssc-kpi/

Collection Methodology for Key Performance Indicators for Smart Sustainable Cities: https://unece.org/DAM/hlm/documents/Publications/U4SSC-CollectionMethodologyforKPIfoSSC-2017.pdf

Check your answers

Module 1

1) False; 2) False; 3) True; 4) False; 5) True.

Module 2

1) C

Module 5

1) Answer: This statement is false. M&A activities should be planned from the start of any project and the M&A process should take place throughout a project so that progress towards goals is measured regularly and any necessary adjustments made to the project implementation.

2)

1. B (Assessment).
2. E (Outputs).
3. C (Indicator).
4. G (Impact).
5. F (Outcomes).

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