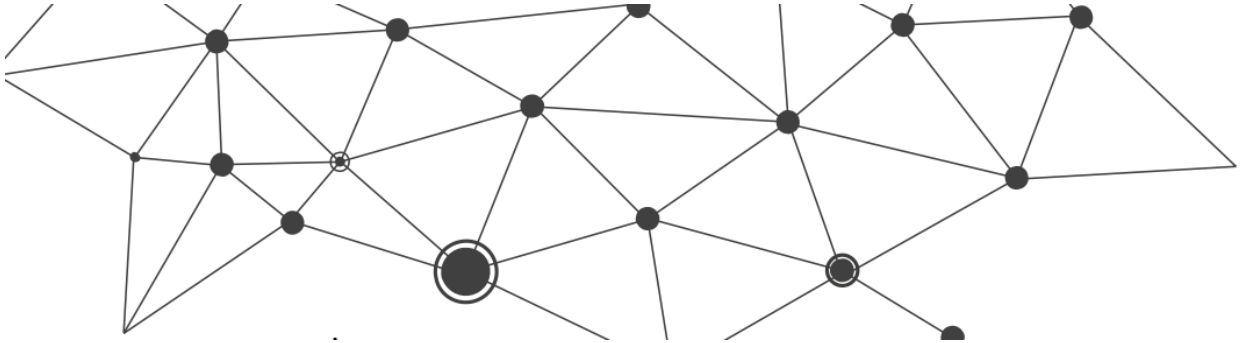


Smart cities and digitalization

Ms. Daiva Matonienė
Expert
Former Vice Minister of
Environment of Lithuania

04 November 2021

Partners of Connective Cities

Deutscher Städtetag

ENGAGEMENT GLOBAL
Service für Entwicklungsinitiativen

with its
SERVICE AGENCY
COMMUNITIES IN ONE WORLD

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Commissioned by

Federal Ministry
for Economic Cooperation
and Development

Cities account for about two-thirds of **global energy demand**.

Buildings produce a fifth of the world's **CO2 emissions**.

Cities produce up to 70% of global **greenhouse gas emissions.**

Buildings account for roughly 40% of the world's **energy use**.

An estimated 80% of global **GDP** is generated in cities

Taking up the challenge

“Updates about data of air quality are important to me. On ‘bad’ days I’d rather stay inside.”

SANJAY (PUNE, INDIA)

“Finding a parking spot is so time consuming. I wish my car could do that on its own.”

EMILY (SAN FRANCISCO, U.S.)

“Smart technologies could help the 15 million people living in my city save lots of energy.”

XIAOFEI (TJANJIN, CHINA)

“Whether I go jogging in the park or come home late – I want to feel safe.”

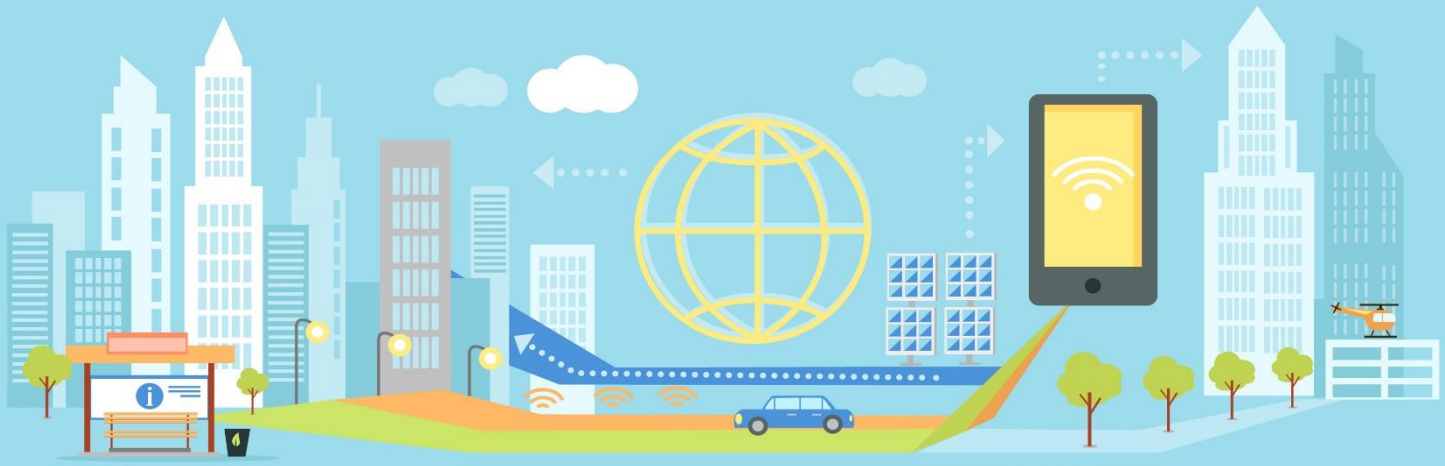
PAULA (BERLIN, GERMANY)

What Exactly is a Smart City?

Video: https://www.thalesgroup.com/en/markets/digital-identity-and-security/iot/inspired/smart-cities

International definition

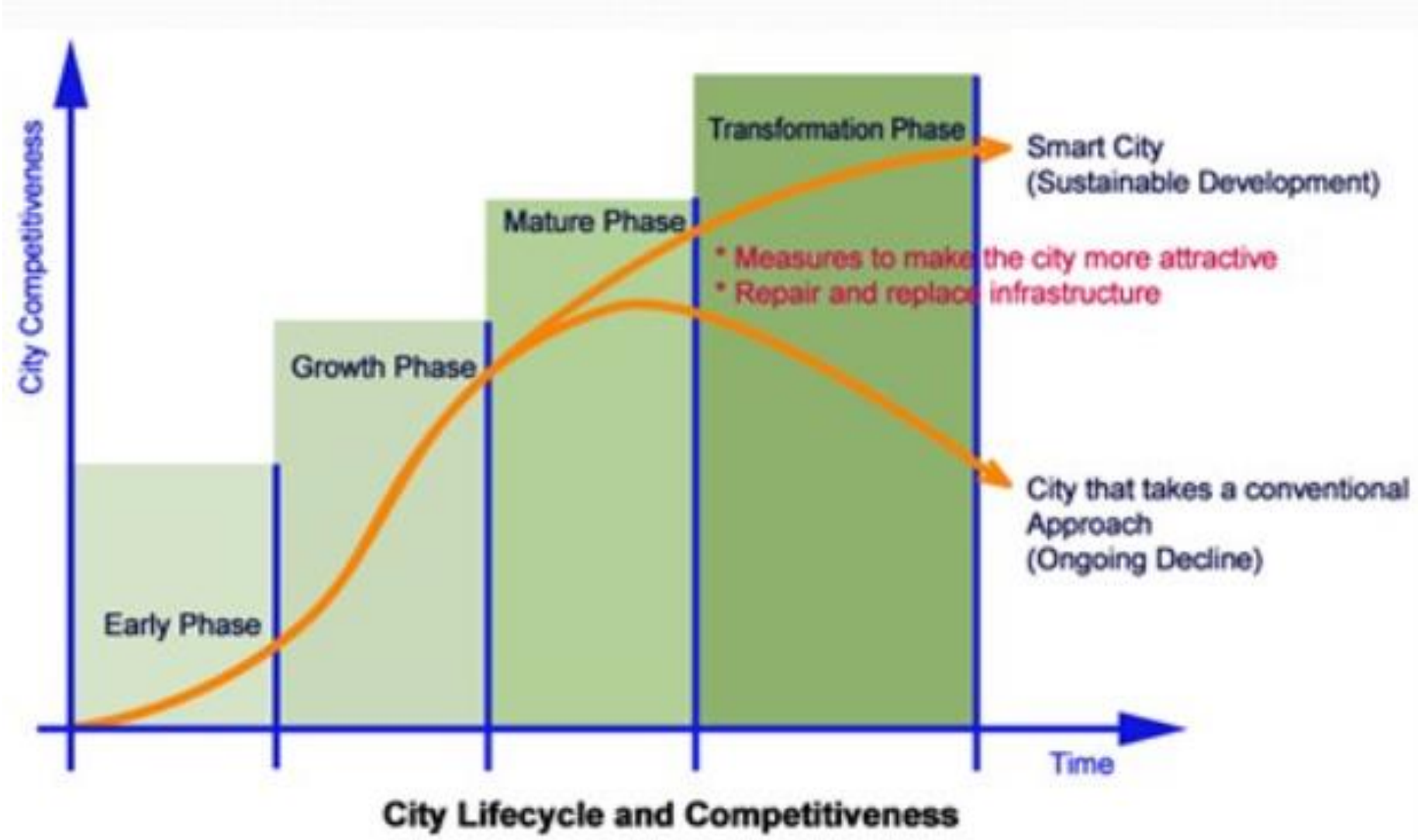
"*A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to* ***economic, social, environmental as well as cultural aspects***".



UNECE

Smart Sustainable Cities

What Smart cities are needed now?



Smart city: introduction

Definition of Smart City *by Boyd Cohen*:

- Smart cities use information and communication technologies (ICT) to be more intelligent and efficient in the use of resources, resulting in cost and energy savings, improved service delivery and quality of life, and reduced environmental footprint--all supporting innovation and the low-carbon economy.

Origin of Smart city

- The concept of smart cities originated at the time when the entire world was facing one of the worst economic crises. In 2008, IBM began work on a 'smarter cities' concept as part of its Smarter Planet initiative. By the beginning of 2009, the concept had captivated the imagination of various nations across the globe.

Initiative of European cities for being Smart

- European cities tend to be denser and have better public transit.
- Larger commitment to cycling and walking.
- A stronger focus on sustainability and low-carbon solutions.

Smart cities for growing population

There is a worldwide trend toward Smart Cities as shown by the following:

- Half of the world population is living in cities in 2013
- Half of the population of Asia will be living in cities by 2020
- Half of the population of Africa will be living in cities by 2035
- Population in cities is expected to grow from 3.6 Billion to 6.3 Billion by 2050.
- Over 50% of urbanization involves cities of less that 500K people
- India's Population in 2011 was 1.21 billion
- Current Population of India in 2014 is 1.27 billion
- Nine satellite cities could be covered under this scheme.
- About 44 cities with 10 lakh to 40 lakh population, 17 state capitals, 10 tourist and religious cities and another 20 with 5 lakh to 10 lakh population could also make it to the list.

"Smart cities" includes

- Smart Living
- Smart Building & Home
- Smart Transportation
- Smart Energy (Renewable generation & storage, AMI,PQM,PLM,OMS)
- Smart Water Management
- Smart Waste Management(Recycling of waste, residual management, Recovery of waste organics & Energy)
- Smart Education(e-Education)
- Smart Governance(e-governance)
- Smart Medical Facility(e-Medical)
- Smart Communications
- Smart Networks
- Environmental Awareness (i.e. changing weather conditions; human defined changes)

Smart city development models and concepts

The Smart Transportation model

The smart transportation model refers to cities that aim to control urban congestion by leveraging technologies, such as IT and communications as well as public transportation, car sharing and/or self-driving cars.

Singapore and Dubai are included in this group.

Video: https://edition.cnn.com/style/article/dubai-autonomous-public-transport/index.html

The Essential Services Model

The essential services model characterizes cities by their use of mobile networks in emergency management and health-care services. Cities like Tokyo and Copenhagen already have mature communication infrastructures and have invested in a few, well-chosen programs

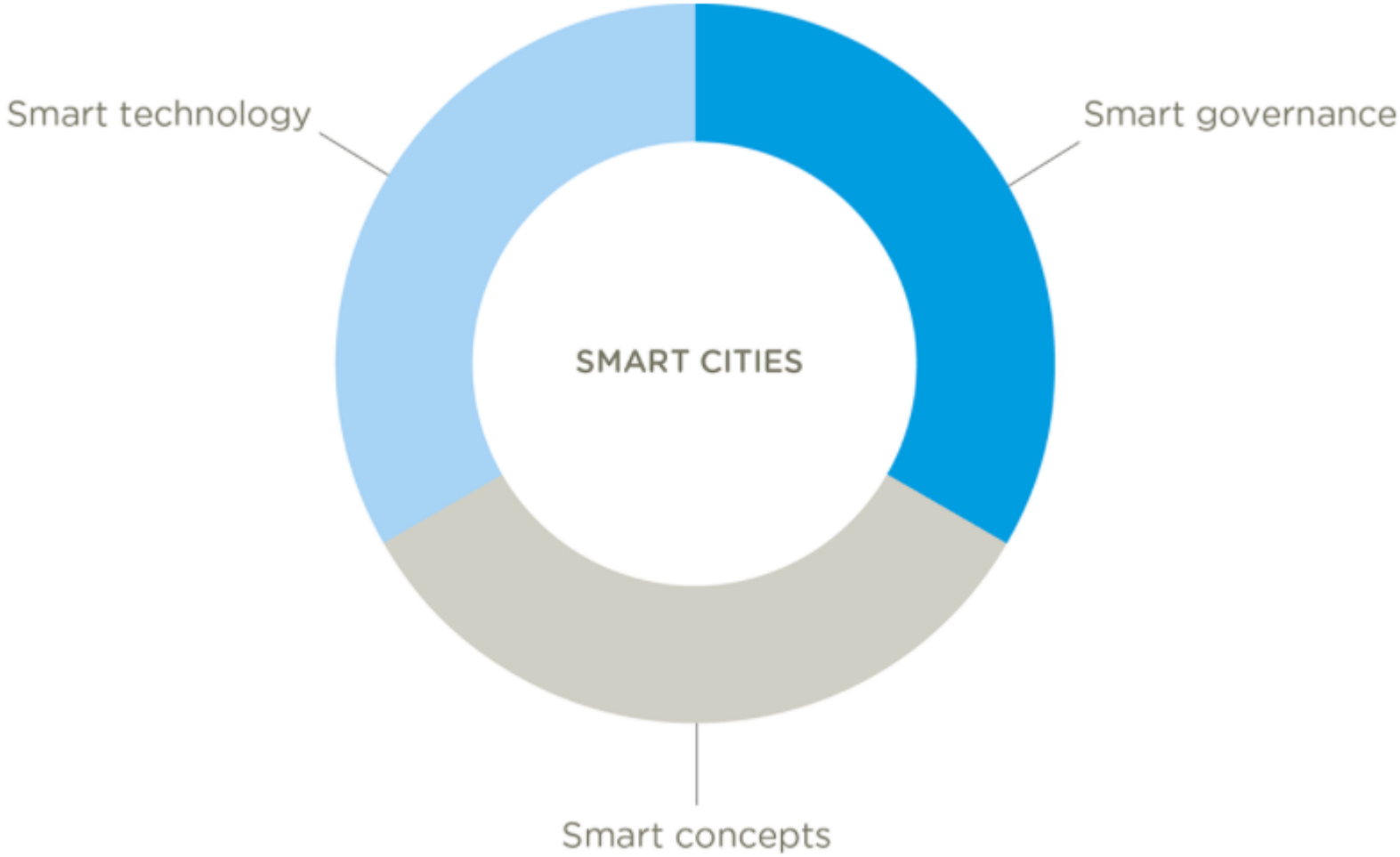
The broad spectrum model

Cities using the broad spectrum model tend to have a high level of civic participation and emphasize management of urban services, such as water, sewage and waste as well as pollution control

The Business Ecosystem Model

The business ecosystem model is the most common tactic. It uses technology development to jumpstart economic activity by investing in digital skills training and supports high-tech businesses

Smart city development models and concepts



“SMART” describes the city’s ability to create well-being for its citizens

Pandemic accelerated the rise of smart cities

Pandemic accelerated the rise of smart cities

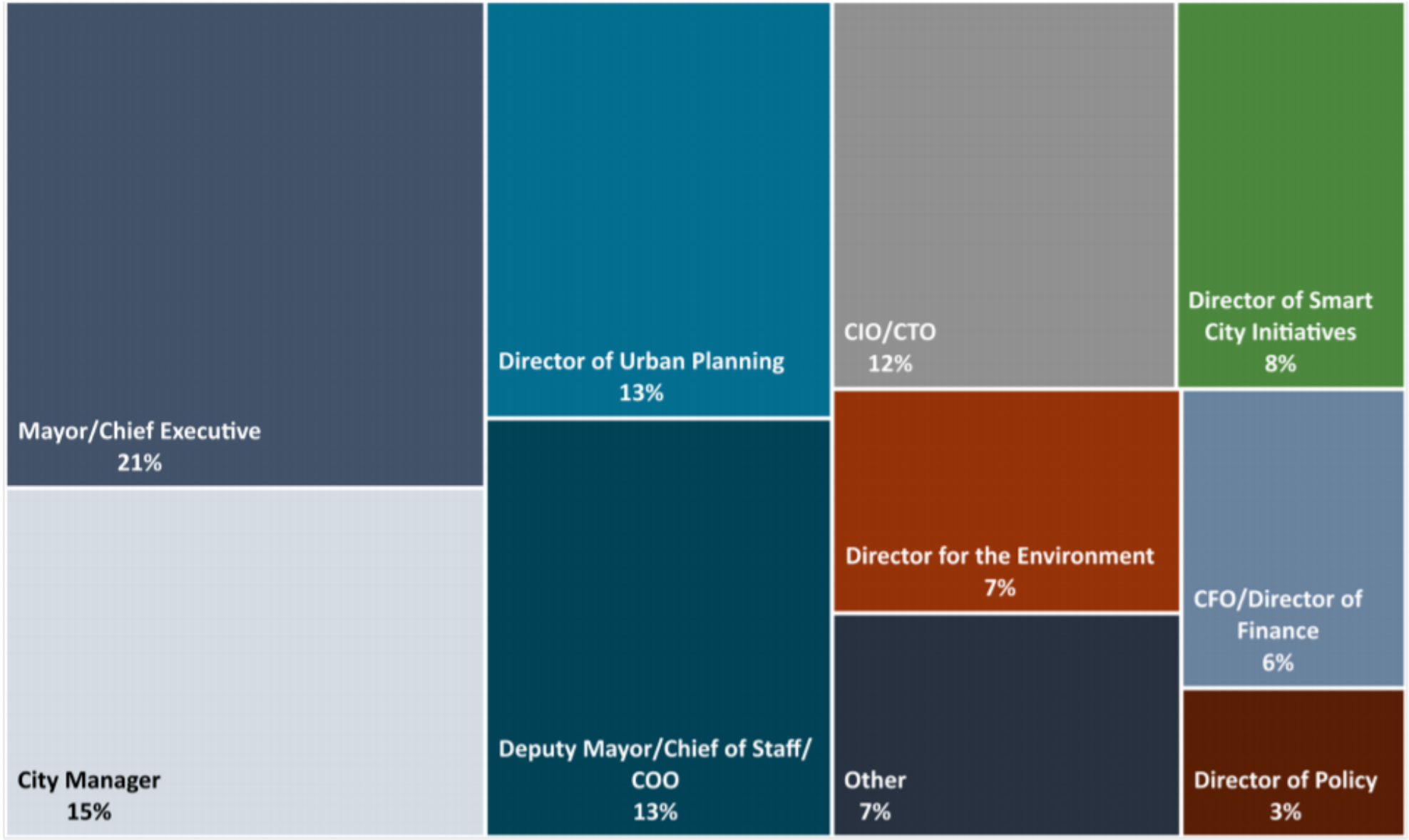
In the pandemic era, ensuring a healthy, safe, and prosperous future for citizens has been a burning imperative for city leaders. But with city budgets under pressure, it also has been their biggest challenge. COVID-19 has served as a stress test for municipalities as businesses and services were shut down and medical facilities stretched to their limit

“The challenges we faced with the pandemic—the need for a good health system, a good education system, less inequalities, and a more resilient economy—were already on the agenda. The pandemic just made us believe more in the agenda”

Miquel Rodriguez Planas, 2030 Agenda Commissioner, Barcelona City Council

Survey in 167 cities carried out

(published 30 March 2021)



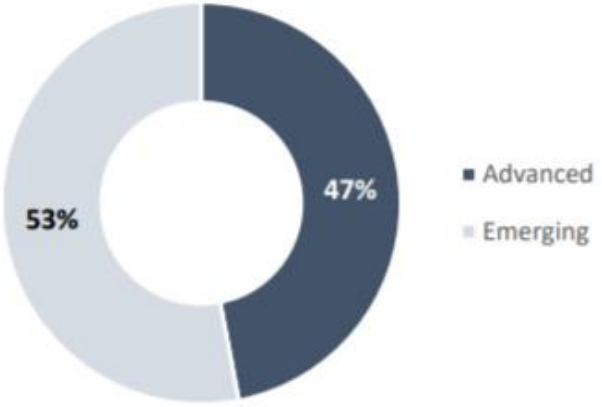
Research methodology

Survey area: 167 cities by geographical coverage

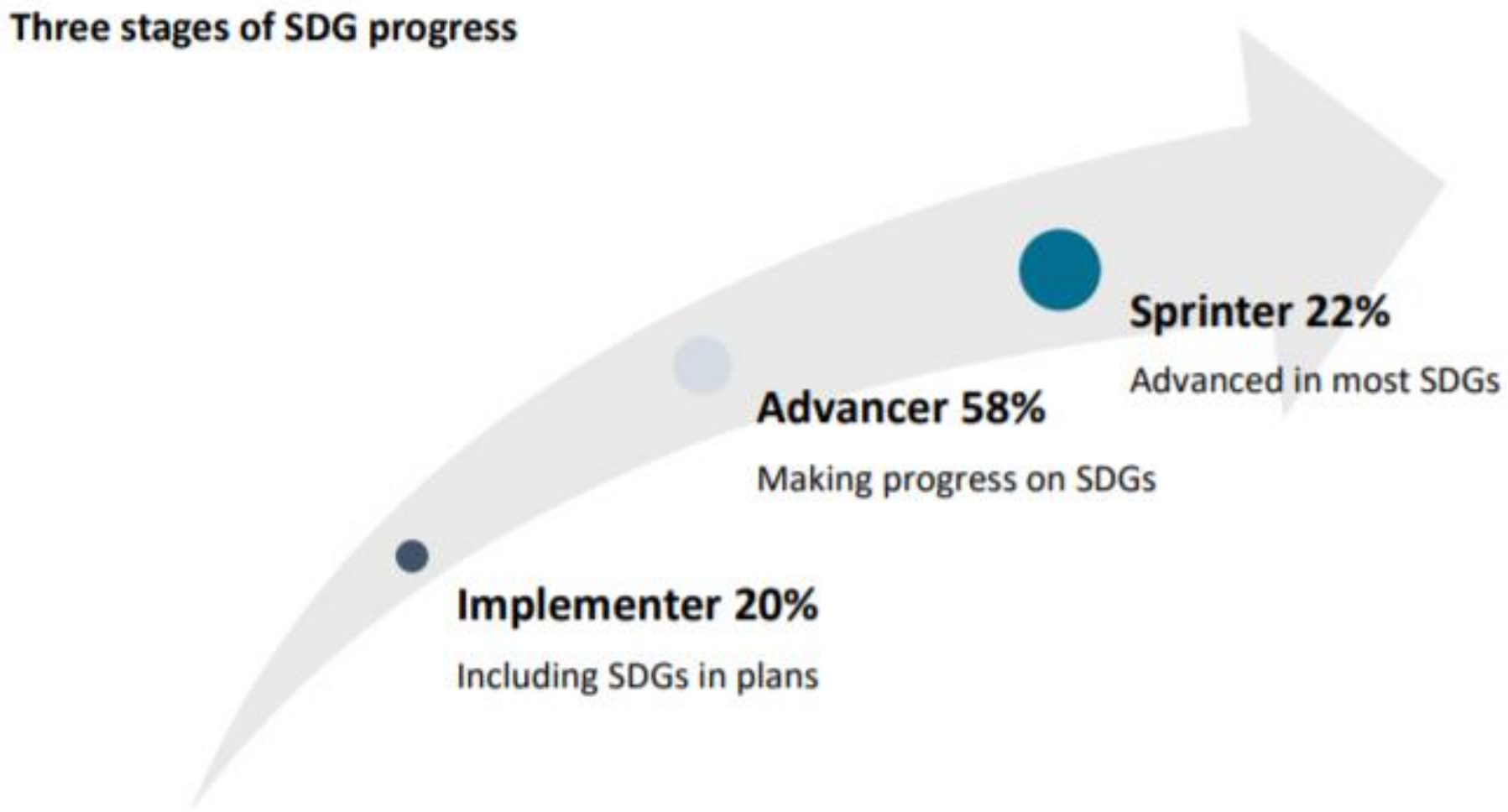
Number of cities by region

By population

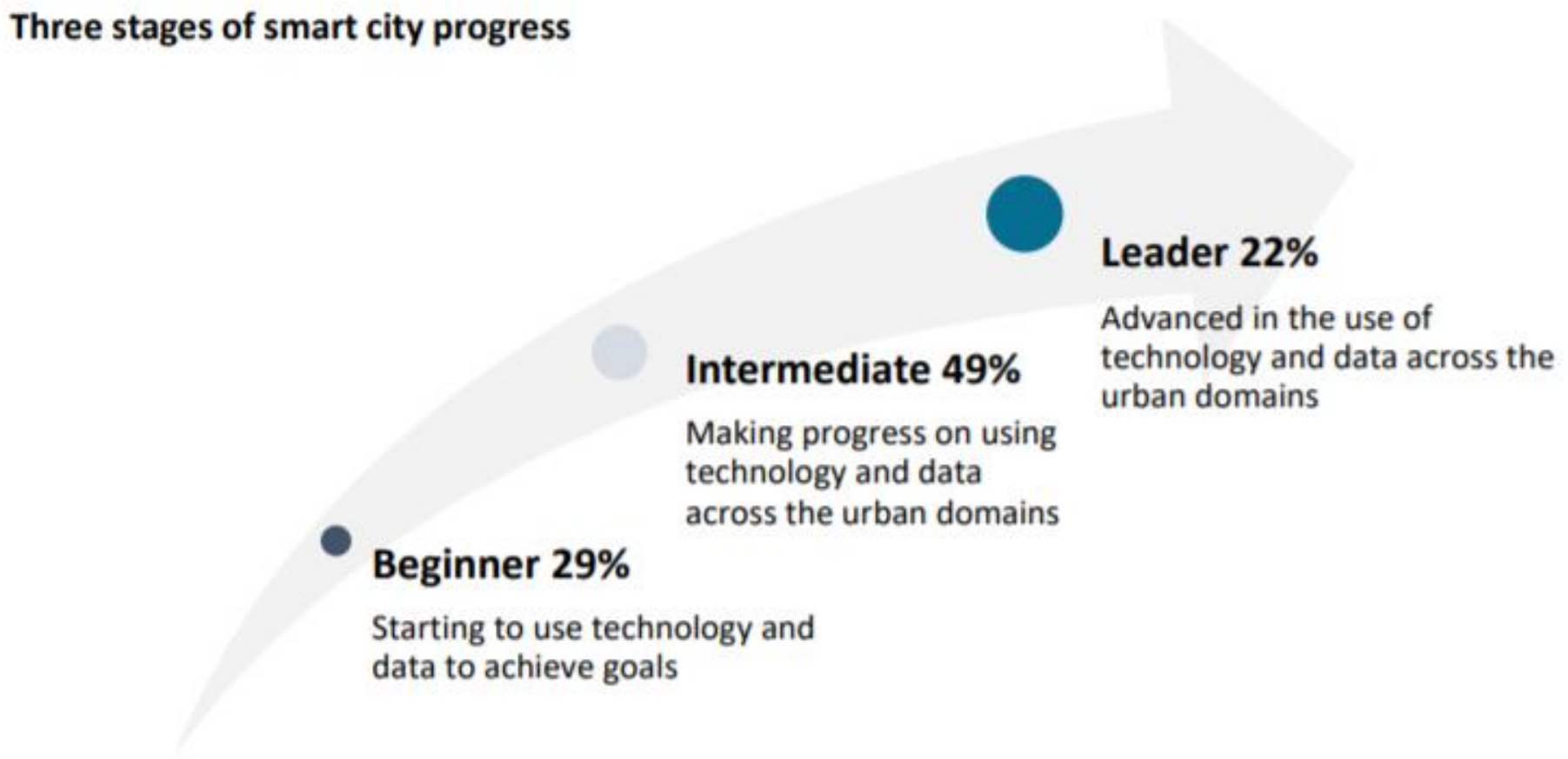
By level of development



Cities were categorized in three stages of SDG progress



Cities were categorized in three stages of Smart city progress



Key findings of the survey (1)

When smart and sustainable meet: Cities 4.0

What sets Cities 4.0 apart?

They are further ahead in smart city initiatives

On average, they widely deploy 14 smart city projects vs. an average of seven for others

They have superior infrastructure

Better public transportation, roads, parks, healthcare, and digital connectivity

They have made the greatest progress on nearly all SDGs

On average, 86% have made progress across all SDGs vs. 62% of all cities

Smart meets sustainable: 20 cities

Cities 4.0

- Aarhus
- Athens
- Baltimore
- Barcelona
- Berlin
- Birmingham
- Boston
- Copenhagen
- Helsinki
- London
- Los Angeles
- Madrid
- Moscow
- New York
- Orlando
- Paris
- Philadelphia
- Singapore
- Tallinn
- Vienna

Key findings of the survey (2)

Cities categorized by SDG progress

Sprinter (22%)		Advancer (58%)						Implementer (20%)	
Aarhus	Mexico City	Abu Dhabi	Chengdu	Honolulu	Monterrey	Raleigh, NC	Tunis	Allentown	Kampala
Accra	Montevideo	Addis Ababa	Chennai	Istanbul	Montreal	Reykjavik	Vancouver	Bamako	Kano
Amman	**Moscow**	Adelaide	Chicago	Jakarta	Munich	Rio de Janeiro	Victoria	Benin City	Kinshasa
Athens	Mumbai	Ahmedabad	Cincinnati	Jerusalem	Nanjing	Riyadh	Warsaw	Blantyre	Kochi
Baltimore	**New York**	Almaty	Colima	Kansas City	Nashville	Rotterdam	Washington, DC	Cairo	Lagos
Barcelona	**Orlando**	Amsterdam	Columbus	Kigali	Newark	San Antonio	Wuhan	Changchun	Lahore
Berlin	Osaka	Asuncion	Dehradun	Kuala Lumpur	Ningbo	San Diego	Xiamen	Chongqing	Libreville
Birmingham	**Paris**	Atlanta	Denver	Kuwait City	Oakland	San Francisco		Cotonou	Lusaka
Bogota	**Philadelphia**	Auckland	Detroit	Liege	Oslo	San Jose		Dalian	Monrovia
Boston	Pittsburgh	Austin	Doha	Lima	Panama City	Santiago de Chile		Dar es Salaam	Pearland
Bratislava	Quebec	Bangkok	Dublin	Lisbon	Phnom Penh	Seattle		Guiyang	Pune
Buenos Aires	Sao Paulo	Beijing	Edmonton	Ljubljana	Phoenix	Seoul		Harare	Qingdao
Copenhagen	**Singapore**	Belgrade	Ekurhuleni	Lucknow	Portland	Shanghai		Hefei	San Juan
Helsinki	Stockholm	Brantford	El Paso	Ludhiana	Porto	St Petersburg		Ibadan	Tianjin
Kyiv	Suzhou	Bucharest	Fukuoka	Manama	Prague	Tbilisi		Jaipur	Toyama
London	**Tallinn**	Busan-Ulsan	Galway	Manchester	Quezon City	Toronto		Jena	Yangon
Los Angeles	Tokyo	Calgary	Hangzhou	Manila	Quito	Touba		Jiaozuo	
Madrid	**Vienna**	Canberra	Hanoi	Mariupol	Rabat	Tulsa		Jinan	

Cities in bold are also classified as Cities 4.0.

Key findings of the survey (3)

Cities categorized by smart city progress

Leader (22%)		Intermediate (49%)					Beginner (29%)		
Aarhus	**Los Angeles**	Accra	Denver	Kyiv	Pittsburgh	Suzhou	Ahmedabad	Jena	Quezon City
Abu Dhabi	**Madrid**	Addis Ababa	Doha	Lisbon	Portland	Tokyo	Allentown	Jinan	San Jose
Amsterdam	Montreal	Adelaide	Edmonton	Ljubljana	Porto	Tulsa	Almaty	Kampala	San Juan
Athens	**Moscow**	Amman	Ekurhuleni	Lucknow	Pune	Victoria	Bamako	Kigali	Tbilisi
Atlanta	**New York**	Asuncion	El Paso	Ludhiana	Quebec	Warsaw	Bangkok	Kochi	Tianjin
Auckland	**Orlando**	Austin	Fukuoka	Manama	Quito		Benin City	Lagos	Touba
Baltimore	**Paris**	Beijing	Guiyang	Manila	Rabat		Blantyre	Lahore	Toyama
Barcelona	**Philadelphia**	Belgrade	Hanoi	Monterrey	Raleigh		Brantford	Libreville	Tunis
Berlin	Prague	Bogota	Harare	Montevideo	Reykjavik		Changchun	Liege	Wuhan
Birmingham	Rotterdam	Bratislava	Hefei	Mumbai	Rio de Janeiro		Chongqing	Lima	Xiamen
Boston	Seattle	Bucharest	Honolulu	Munich	Riyadh		Colima	Lusaka	Yangon
Chicago	Seoul	Buenos Aires	Jakarta	Nanjing	San Antonio		Cotonou	Manchester	
Columbus	**Singapore**	Busan-Ulsan	Jerusalem	Nashville	San Diego		Dalian	Mariupol	
Copenhagen	**Tallinn**	Cairo	Jiaozuo	Newark	San Francisco		Dar es Salaam	Mexico City	
Detroit	Toronto	Calgary	Kano	Oakland	Santiago de Chile		Dehradun	Monrovia	
Dublin	Vancouver	Canberra	Kansas City	Osaka	Sao Paulo		Galway	Ningbo	
Helsinki	**Vienna**	Chengdu	Kinshasa	Oslo	Shanghai		Hangzhou	Pearland	
Istanbul	Washington	Chennai	Kuala Lumpur	Panama City	St Petersburg		Ibadan	Phnom Penh	
London		Cincinnati	Kuwait City	Phoenix	Stockholm		Jaipur	Qingdao	

Cities in bold are also classified as Cities 4.0.

Key findings of the survey (4)

Cities are focusing on the SDGs around people and prosperity

77%
average percentage of cities that include each of the SDGs in their plans

% of cities including SDGs in their plans

PEOPLE
End poverty and hunger in all forms and ensure dignity and equality

No poverty (91%)
Good health and well-being (89%)
Quality education (86%)
Gender equality (77%)
Zero hunger (75%)

PLANET
Protect our planet's natural resources and climate for future generations

Life on land (83%)
Clean water and sanitation (78%)
Life below water (77%)
Responsible consumption and production (69%)
Climate action (64%)

PROSPERITY
Ensure prosperous and fulfilling lives in harmony with nature

Decent work and economic growth (86%)
Industry, innovation, and infrastructure (79%)
Sustainable cities and communities (78%)
Affordable and clean energy (72%)
Reduced inequalities (60%)

PEACE
Foster peaceful, just, and inclusive societies

Peace and justice strong institutions (78%)

PARTNERSHIPS
Revitalize the global partnership for sustainable development

Partnerships for the goals (71%)

Key findings of the survey (5)

SDG scorecard: Where have cities made the most progress?

SDGs		Population*			Economic development		SDG leadership			
	All	Small	Medium	Large	Advanced	Emerging	Implementers	Advancers	Sprinters	Cities 4.0
No poverty	82%	80%	79%	91%	84%	81%	53%	88%	100%	90%
Decent work and economic growth	74%	72%	79%	66%	89%	60%	41%	80%	88%	85%
Quality education	70%	72%	70%	66%	82%	59%	38%	75%	88%	85%
Good health and well-being	70%	77%	69%	60%	90%	52%	29%	77%	81%	95%
Sustainable cities and communities	67%	74%	64%	60%	81%	55%	35%	77%	69%	70%
Industry, innovation, infrastructure	66%	75%	61%	60%	87%	48%	18%	77%	69%	95%
Life on land	65%	77%	60%	51%	87%	44%	18%	74%	75%	90%
Clean water and sanitation	63%	71%	58%	57%	82%	45%	18%	71%	88%	80%
Gender equality	61%	65%	60%	57%	77%	47%	9%	70%	81%	90%
Affordable and clean energy	57%	57%	55%	60%	63%	51%	35%	55%	81%	85%
Responsible consumption, production	56%	55%	54%	63%	61%	52%	32%	57%	69%	85%
Partnerships for the goals	56%	57%	54%	60%	67%	47%	29%	59%	69%	80%
Peace and justice strong institutions	56%	69%	49%	46%	73%	41%	24%	58%	88%	80%
Life below water	55%	49%	61%	54%	57%	53%	41%	52%	69%	85%
Zero hunger	53%	58%	58%	34%	77%	32%	6%	59%	81%	85%
Climate action	50%	37%	55%	66%	35%	64%	56%	42%	69%	65%
Reduced inequalities	47%	46%	51%	40%	63%	32%	18%	48%	63%	75%
Average	**62%**	**64%**	**61%**	**58%**	**74%**	**51%**	**29%**	**66%**	**78%**	**84%**

* Small = 600,000 to 1m inhabitants; medium = 1m to 5m inhabitants; large = 5m to 10m inhabitants.

Q6a: Which of the SDGs are included in your city's plans and on which of them has your city made considerable progress? blue=high, gray=low

Key findings of the survey (6)

European cities lead the way, while African cities trail behind

Less

Africa

Climate action	58%
Partnerships	47%
Life on land	42%
Good health	42%
Quality education	42%
Decent work	42%
No poverty	42%
Average	**33%**

Latin America

No poverty	87%
Sustainable cities	60%
Gender equality	60%
Responsible consumption	60%
Decent work	53%
Climate action	53%
Average	**47%**

Moderate

Asia

No poverty	91%
Decent work	74%
Quality education	72%
Climate action	67%
Life on land	67%
Good health	61%
Sustainable cities	59%
Average	**58%**

MENA

No poverty	100%
Affordable & clean energy	90%
Partnerships	90%
Industry & innovation	80%
Gender equality	80%
Quality education	70%
Average	**63%**

More

Europe

Good health	95%
Decent work	92%
Clean water	86%
Sustainable cities	86%
Industry, innovation	84%
No poverty	86%
Quality education	84%
Average	**77%**

North America

Industry, innovation	90%
Good health	85%
Sustainable cities	85%
Decent work	85%
Life on land	85%
No poverty	83%
Average	**71%**

Key findings of the survey (6)

SDG sprinters take five key steps to ensure

Five steps to SDG sprinter success

Monitor progress

94% regularly monitor SDG progress vs. **70%** of other cities. Only **12%** of implementers track progress.

Gain wide support

86% enjoy wide support across city government, including high levels, vs. **57%** of other cities.

Select a department to lead

78% have a department that leads SDG efforts vs. only **46%** of other cities and none of the implementers.

Assess results against peers

72% measure SDG progress against peers to identify strengths and weaknesses vs. **40%** of other cities.

Conduct a voluntary local review

58% have done voluntary local reviews of SDG progress vs. only **40%** of other cities.

"Cities are about people, not gadgets. We should be mindful of diversity, equity, and inclusion to ensure that any techniques or technology are based on improving quality of life for all."

Karen Lightman, Executive Director, Metro21: Smart Cities Institute, Carnegie Mellon University

Key findings of the survey (7)

The impact of the pandemic

Top external disruptions

81%
Pandemic and its repercussions

46%
Decline in economic growth

28%
Rising digital expectations of citizens

25%
Climate change

23%
Lack of resources

18%
Shifting demographics and diversity

18%
Social unrest

The pandemic's lasting impacts

69% Reconsider urban planning & use of space

54% Rethink mobility & transportation

54% Accelerate the shift to online healthcare

53% Permanently change how people live, work, socialize, & travel in cities

36% Expose the weaknesses in cities' operational continuity capabilities

Key findings of the survey (8)

The pandemic heightened the SDG imperative

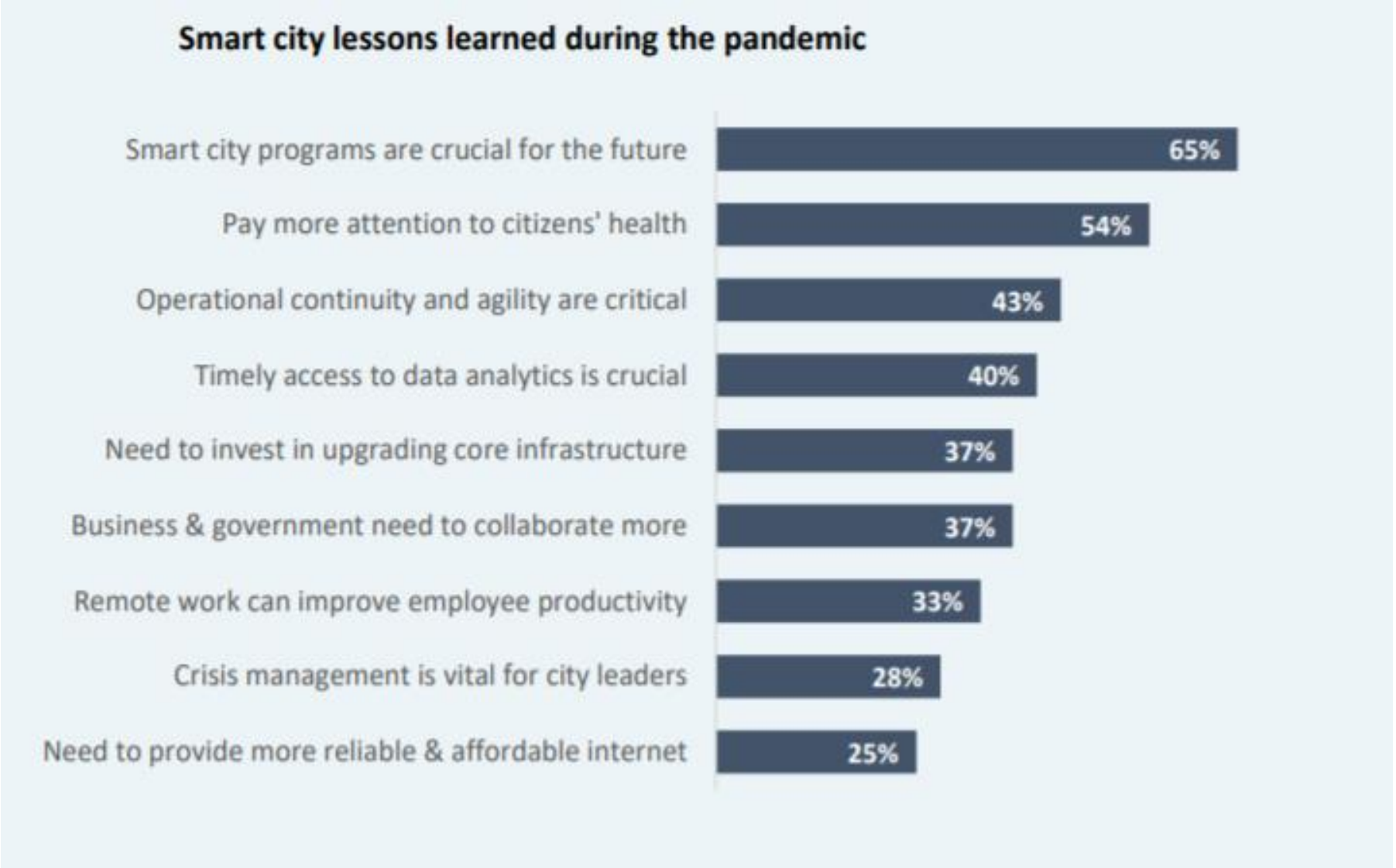
The pandemic made the social good a higher priority for more than one-third of cities around the world. The number is even higher in Europe, where it has prompted 43% of cities to do further soul searching

"The pandemic will upturn traditional urban development models and compel cities to reimagine mobility, health infrastructure, housing, education, energy consumption, and more. It has laid bare the inequities in access and has impacted disadvantaged communities more. Along with inclusion, addressing these systemic inequities in the current urban development model will be critical for cities."

Michael Flynn, Global Government & Public Services Financial Advisory Leader, Deloitte

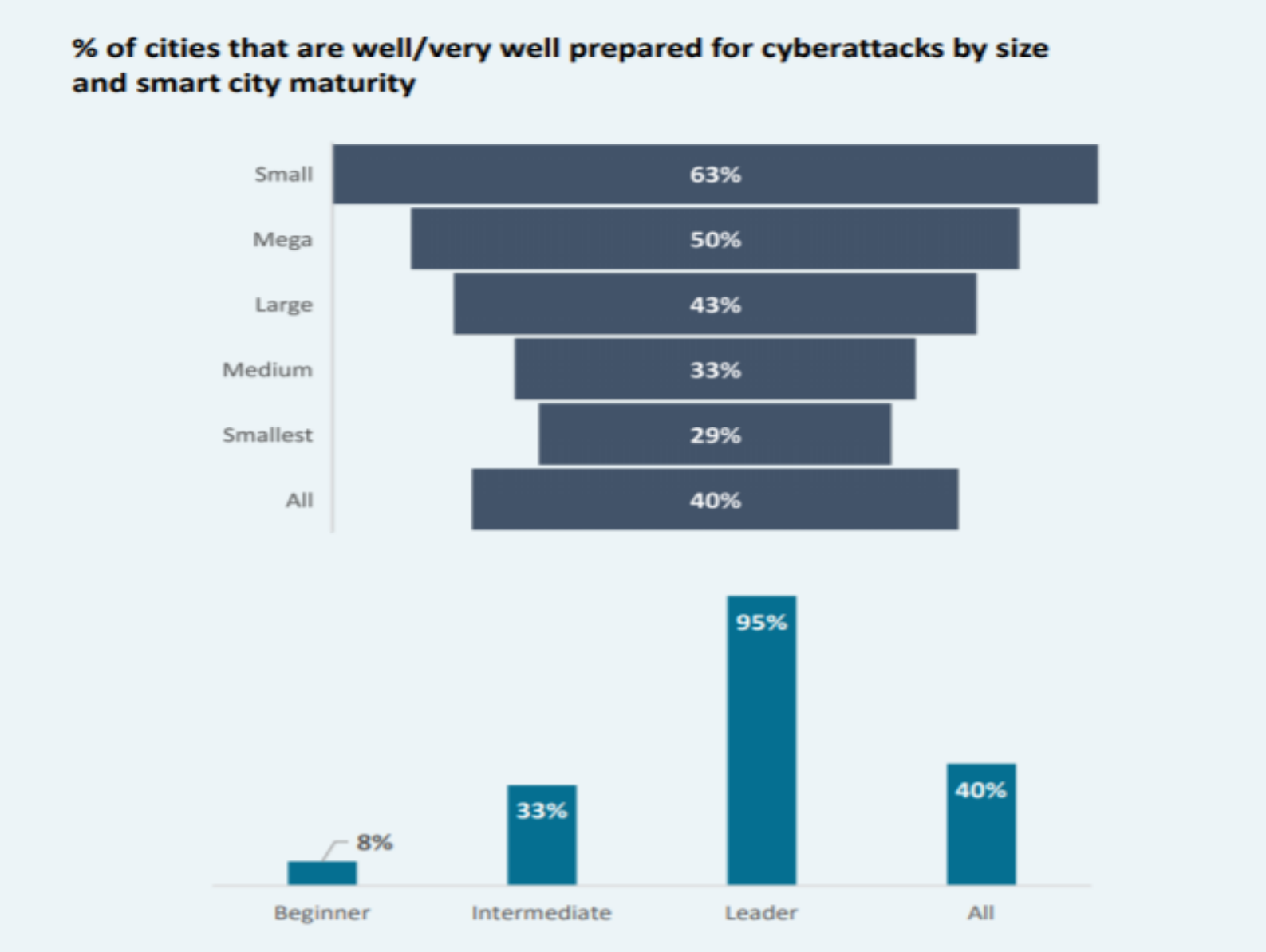
Key findings of the survey (9)

COVID-19 highlighted the value of smart city programs



Key findings of the survey (10)

Pandemic also underscored the need for cybersecurity



Key findings of the survey (11)

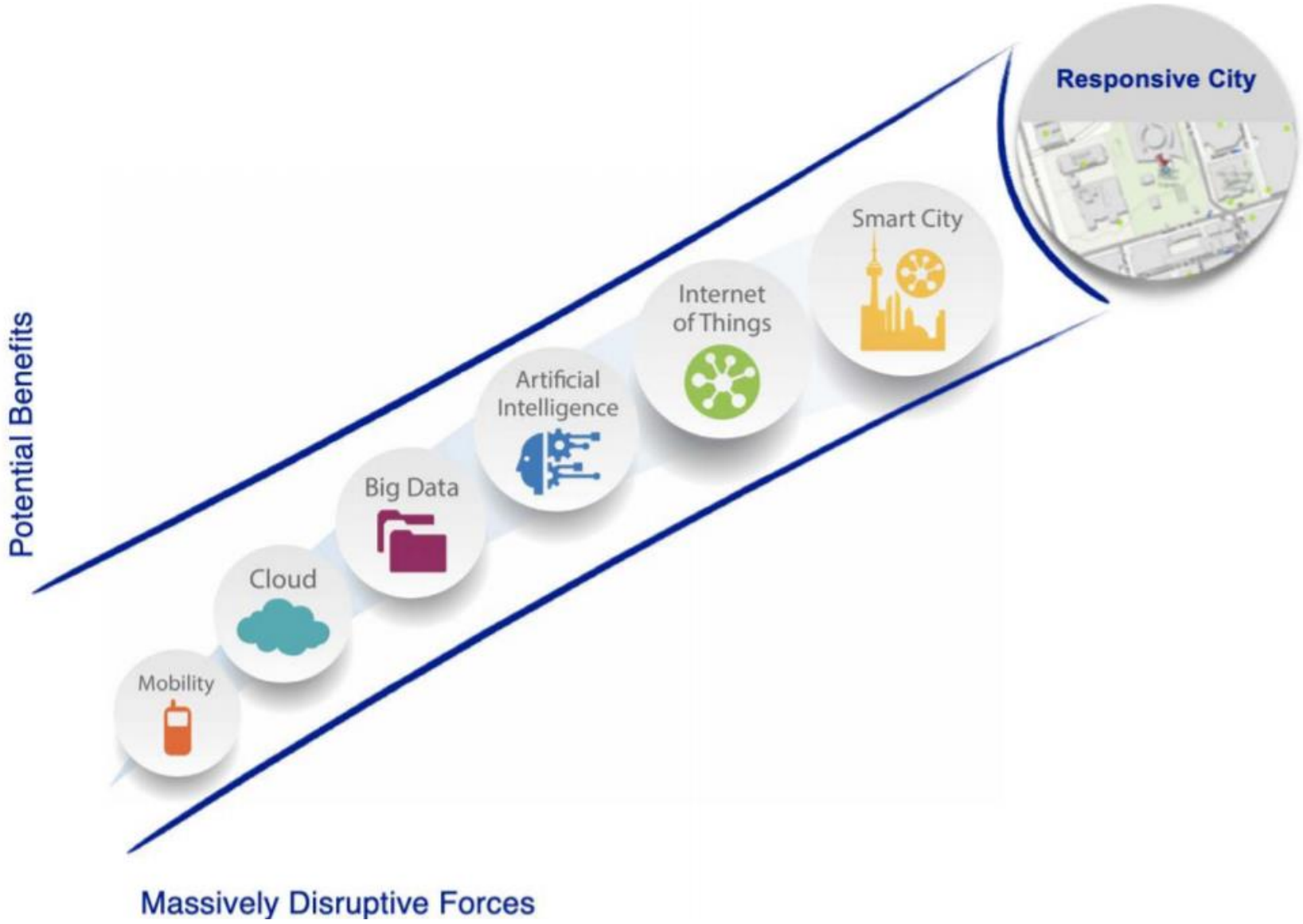
Where do smart city leaders invest more in cybersecurity?

Areas where smart city leaders invest more

	Leader	All	Difference
Prioritize assets & create access control policies	68%	49%	19%
Disaster recovery, response, & event management technology	46%	31%	15%
Cybersecurity training for staff	54%	40%	14%
Protect critical infrastructure, including security testing	49%	35%	14%
Develop incident response & recovery plan	43%	29%	14%
Augment staff with outside specialists or outsourced functions	32%	23%	9%
End-point security, such as securing mobile devices & laptops	19%	12%	7%
Cloud & network security	70%	65%	5%
Hire more cybersecurity specialists & staff	78%	76%	2%

Digitalization solutions for cities

Digitalization trajectory



Supporting the city's areas of focus

Housing

Mobility

Modernization

Financial Sustainability

Employee Experience

Enabling the foundational elements for a Digital City

Digital Platforms

Deliver City services over digital platforms

Data

Drive Effective Outcomes Through the Use of City and Third Party Data

Workforce Enablement

Connected Workforce to Collaborate Across the City to Improve Service Delivery

Internet of Things

Connectivity and Management of Physical Devices That Are Integral to Service Delivery

Supporting the city's areas of focus

Digital Services

Improving customer service through increased digital self-serve functionality as a lower cost, more readily available channel.

Work & Asset Management

Integrated Enterprise Work and Asset Management, improving service levels, automating cross-divisional processes, optimizing asset utilization..

Human Resources Transformation

Modernizing the Human Resources function to be more efficient, integrated, to deliver more timely and quality advice and services to divisions

Procurement & Supply Chain Transformation

Investments to transform procurement and supply chain processes to drive efficiencies, reduce cycle times and improve quality of service to City divisions

Finance Transformation

Timely, simplified access to accurate financial management capabilities to drive measurable strategic planning and quantified performance management.

Time & Attendance and Payroll Transformation

Integrated staff scheduling with electronic time reporting and automated payroll processing functionality.

Employee Productivity

Provide City employees with technology tools and intuitive IT process that enable and increase productivity.

Practical examples
The 10 Smart cities in Europe

The 10 Smart cities in Europe

1. COPENHAGEN
2. AMSTERDAM
3. VIENNA
4. BARCELONA
5. PARIS
6. STOCKHOLM
7. LONDON
8. HAMBURG
9. BERLIN
10. HELSINKI

The Smart cities in Europe (1)

No. 1: COPENHAGEN

- Led the Siemens Green City Index for Europe
- One of the lowest carbon footprints/capita in the world (less than two tons/capita).
- Aspire to achieve carbon neutrality by 2025
- All new buildings to be carbon neutral (green building).
- Approximately 40% of all commutes are conducted by bike.
- The city also recently collaborated with MIT to develop a smart bike equipped with sensors to deliver to provide real-time info to not only the rider but also to administrators for open data aggregation on issues of air contamination and traffic congestion.

No. 2: AMSTERDAM

- 67% of all trips are done by cycling or walking.
- First bike sharing project in the world was occurred in Amsterdam decades ago.
- At present 40 smart city projects ranging from smart parking to the development of home energy storage for integration with a smart grid.

No. 3: VIENNA

- The "Citizen Solar Power Plant" being developed with a goal of obtaining 50% of their energy from renewable sources by 2030.
- Testing out a range of electric mobility solutions from expanding their charging network from 103 to 440 stations by 2015.
- Residents are sharing vehicle with neighbors.

No. 4: BARCELONA

- Bike-sharing project with more than 6,000 bikes.
- Using various sensors from noise and air contamination to traffic congestion and even waste management.
- The life expectancy in Barcelona is among the highest of cities (approx 83 years).

No. 5: PARIS

- The city has more than 20,000 bikes for sharing.
- 5% reduction in vehicle congestion in the city.
- The city partnered with Bolloré to create one of the world's first and most expansive EV car sharing programs.
- Autolib' will soon have 3,000 EVs in its car sharing fleet.
- Paris' ecosystem was rated 11th best in the world.

The Smart cities in Europe (2)

No. 6: STOCKHOLM

- About 40% of its land mass is dedicated to green space.
- Rated 2nd in Siemens Green City Index.
- Citizens are also amongst the highest per capita users of the Stockholm Metro system.
- Aspires to become carbon neutral, by 2025.
- Endeavour to boast about its 800 kilometers of cycling paths.
- Received top marks for its commitment to digital governance.
- Scored 1st amongst cities for its commitment to data privacy and security for citizens.

No. 7: LONDON

- Earned 1st place in the smart economy category and it has long been considered the financial capital of Europe.
- The Startup Genome project rated London the 7th best entrepreneurial ecosystem in world, and No. 1 in Europe.
- The greenest and smartest buildings of Europe is located in the city eg., The Crystal, built by Siemens.

No. 8: HAMBURG

- 2nd largest city in Germany and the 1st of two to make the top 10 ranking this year.
- Awarded the European Green Capital designation in 2011.
- High standard of living having been ranked 17th globally by Mercer in 2012 and 8th globally by Numbeo.
- Wide scale transformation is taking place at 157 hectares, Hafen City (Harbor City) ,which is Europe's largest urban regeneration project.

No. 9: BERLIN

- Berlin is able to attract and retain the creative class and it has two zoos, three major opera houses, seven symphony orchestras, and scores of museums
- People prefers to walk instead of use car to travel short distance.

No. 10: HELSINKI

- The 10th and final spot in this year's rankings by barely edged out Oslo.
- Having more than 1,000 open datasets and have been actively promoting engagement with developers through collaborative computer programming.
- Launched Virium Smart City Project to provide ubiquitous data to their citizens in hopes of improving quality of life.

European Green Capital Indicators

1. Climate change: mitigation and adaptation
2. Local transport
3. Green urban areas incorporating sustainable land use
4. Nature and biodiversity
5. Ambient air quality
6. Quality of the acoustic environment
7. Waste production and management
8. Water management
9. Waste water treatment
10. Eco innovation and sustainable employment
11. Energy performance
12. Integrated environmental management

Examples: new highlights

Smart Sensors Provide Cost-Saving Solutions in Finland

- In the summer overfilling at the local recycling stations was becoming more common, causing increased littering and cleaning costs. Customers were demanding increased collection intervals, while the service was getting too expensive to maintain.
- The wireless fill-level sensor system provided by Finland-based logistics solution company Enevo, a Council Associate Partner, measures and forecasts when waste containers will be full. Reduce the amount of collections by 51%.

Video: https://reuters.screenocean.com/record/159868

Examples: Lithuanian digital innovation solutions

According to the global competitiveness index of the Swiss-based International Institute for Management Development (IMD), Lithuania enters the 1th position in terms of digital and technology skills, and is 4th in terms of communication technology.

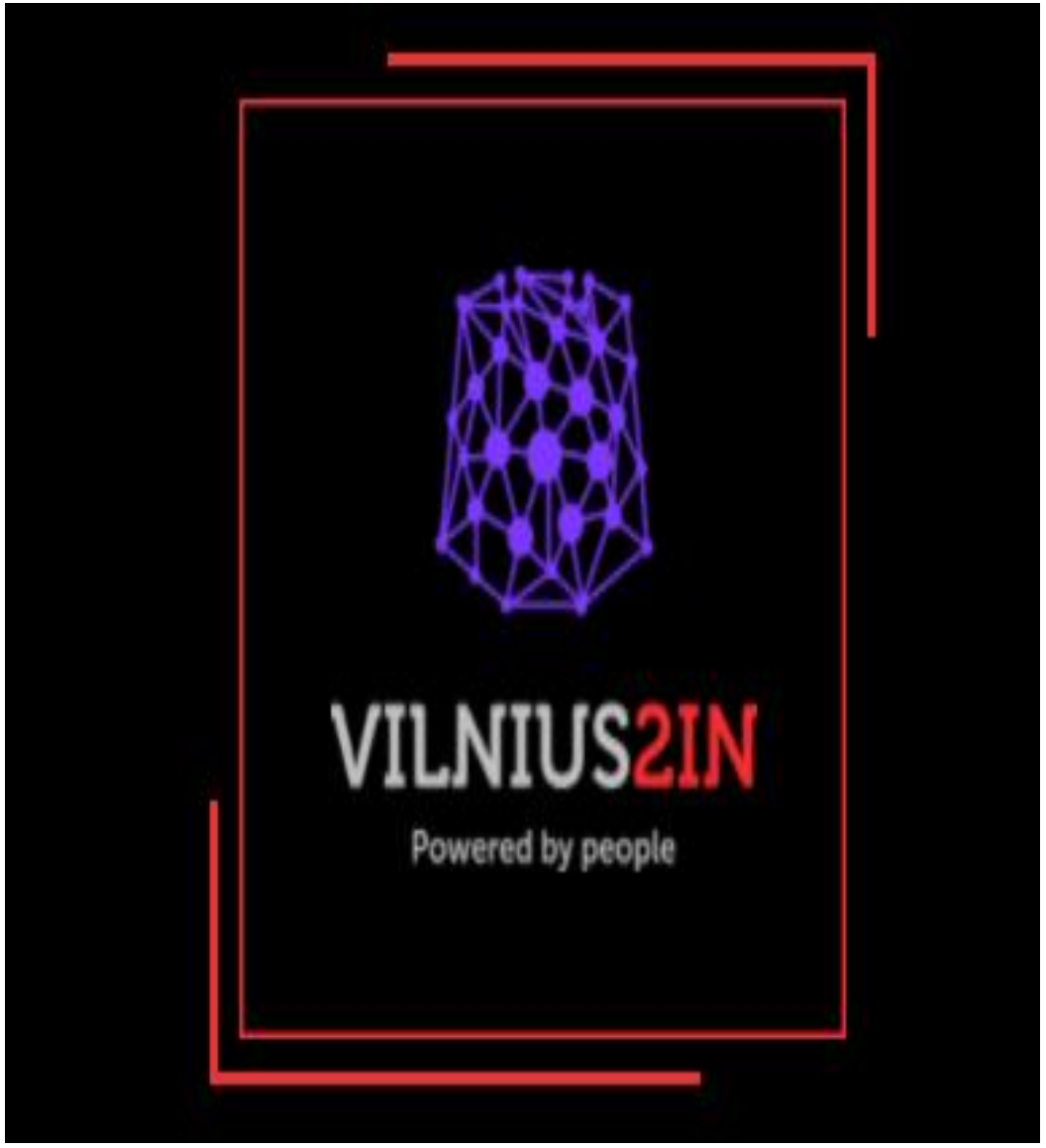
GovTech LAB

The Gov-Tech Lab ensures more cooperation between government and the business community in order to address and overcome the digital challenges that start-ups and small and medium enterprises face. For instance, through the Lab's Gov-Tech Challenge Series programme, any public sector institution is able to identify its own digital challenges and put them forward for discussion at a private sector, academic or individual level.

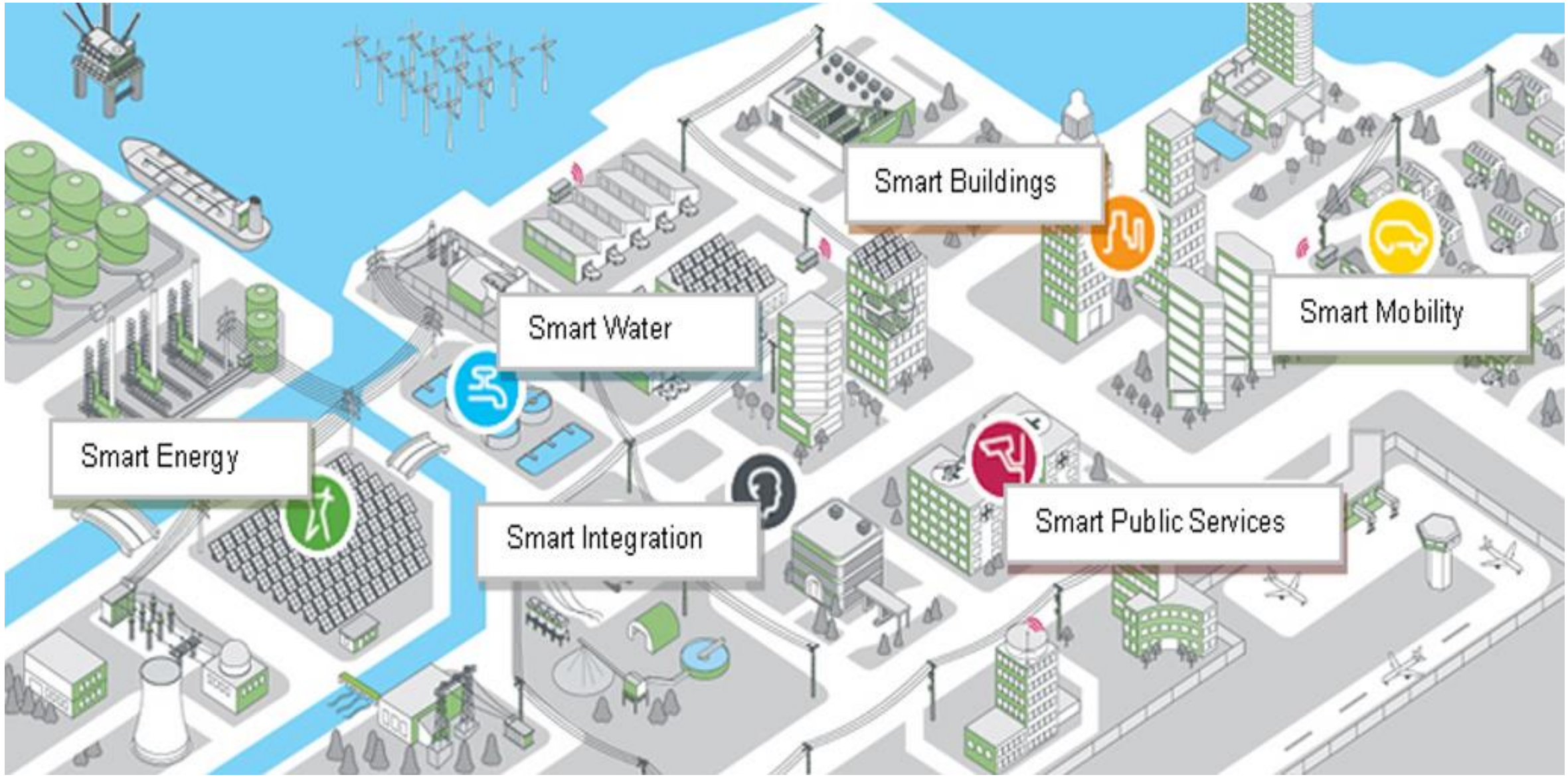
Examples: Vilnius City Municipality, Lithuania

OPEN INNOVATION - OPEN ALGORITHM - OPEN DATA

What‘s the idea?



Smart cities: digitalization solutions



Key findings
Lessons from COVID-19

Key findings

The unequal impact of global crises

- Global crises have very differentiated territorial local impact
- The recent global crises illustrate this in different ways:
  -The global health crisis (COVID-19) represents not just a pandemic but a “syndemic”: a new virus interacting with other non-communicable diseases clustering health outcomes in a very differentiated way
  - The global climate crisis has a very differentiated local impact based on an array of physical, economic and social conditions
  - Urgent need for a reassessment of the role of regional/local policies

Key findings

Why regional policies? Lessons from COVID-19?

- Both the health and climate crises have been characterized by strong local/regional clusters of “infection”
- The European Green Deal will require in its implementation local knowledge, innovation and mitigation skills of local entrepreneurs and regional/local authorities. They have better knowledge on the local situation and are in a better situation to make decisions locally
- At the same time, global (financial) markets are now also shifting in the direction of sustainability putting political pressure on introducing global/national taxation regimes reflecting sustainability
- The EGD drive combining Resources-Regulation-Reforms for a common objective creates many knowledge spill-overs and network externalities for regional actors in the EU
- This provides a new framework for innovation at regional/local level, in short for S4+

Key findings

How? Avoiding local climate lockdowns

There are numerous ways in which place-based innovation for sustainability could be filled in at regional/local level

- A more **local mission strategy** mobilizing citizens as actors: “from yellow to green jackets”. Cities as the invisible atoms of the EU witnessing changes on a daily basis.
- A **broader transition strategy** depending on the region’s current industrial system focusing on transformative change towards sustainability
- An entrepreneurial **diffusion strategy** (re-)attracting external talent, knowledge and leading firms with green-digital expertise giving them local testbeds to develop circular economy processes/products. Such strategies will in parallel reinforce the local innovation system and absorptive capacity
- A complementary **value chain strategy**, depending on the region’s geographical location focusing on connecting local firms with strategic European value chains in clean-tech, digital, circular, bioeconomy

Key findings

- Due to rapid urbanization, many cities have ageing infrastructure with high replacement costs. Converting existing infrastructure to smart infrastructure is the key to improving city operations, and it is directly correlated to quality of life improvements

- Digitalization solutions are a key enablers in achieving sustainable and livable cities. Making informed decisions about which technologies best support a city’s overall development strategy depends on establishing the right governance and identifying the most suitable technical concepts

- The system-of-systems model is the one that provides the best, long-term chances of truly making cities smart; however, it must start with the most important system: people

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